Shiseido's Guidance for Product and Organizational Environmental Footprint Assessment (ver. 1.02)

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This guide provides principles, requirements and guidelines related to the environmental footprint (EF) of products and organizational activities, as defined by the life cycle assessment (LCA) outlined in ISO 14040[1], 14044[2] and "Corporate Value Chain (Scope 3) Standard[3]" of GHG protocol.

The objective of this guide is to promote eco design and minimize environmental impact by providing appropriate methodology to evaluate our efforts on product development or economic activities from a life cycle perspective while preventing greenwash due to the overestimation of avoided effect. If necessary, when evaluating the tradeoff or synergistic effect, system boundaries and impact categories should be expanded. In interpreting and communicating the results of EF evaluation, uncertainties due to the limits of LCA shall be carefully considered, including data quality among secondary databases or differences in the available range of primary data collection between suppliers,.

1. Terms and Definitions

1-1 Greenhouse gas (GHG):

The gas in the atmosphere that can absorb and release infrared radiation emitted from the surface of the earth, atmosphere and clouds. In this guide, GHG includes CO_2, methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

1-2 Product:

Consumer goods provided by Shiseido. Unless otherwise noted, product shall fall under the definition of cosmetics or quasi-drugs provided by *the Japanese Pharmaceuticals and Medical Devices Law*.

1-3 Raw material:

Ingredients or packaging material used in or for the product.

1-4 Packaging material:

Material in whole or in part constituting the bottle, cap, pump, accessory, etc. of a product

1-5 Auxiliary material:

What is consumed only at a specific stage and does not constitute part of the product or accessories. For example, lubricants used at the production stage,

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transportation materials used at the distribution stages, etc.

1-6 Preparation stage for recycling:

A process to prepare for recycling after a thing has been divided into its separate parts.

1-7 Equipment to be used repeatedly:

Tools designed for repeated use, such as pallets and plastic containers.

1-8 Primary data:

The data that is collected directly, such as electricity consumption on a production site.

1-9 Secondary data:

The data that is compiled from static data such as national economic input / output database, agricultural statistics, industrial statistics, etc.

2. Scope

2-1 Component to be targeted by this guide

(1) Contents and ingredients

(2) Packaging materials

- Containers (e.g. bottle, stopper, pump, pouch, etc.)
- Secondary packaging (e.g. carton, blister case, etc.)

(3) Accessories (e.g. manual, brush, etc.)

2-2 Non-target component

(1) Promotional materials attached for a limited time

(2) Equipment to be used repeatedly

2-3 Functional unit

In principle, EF is evaluated based on sales units.

In cases in which the product has a corresponding refill, the weighted EF average between these products, calculated using the content weight and the sales quantity or the planned sales quantity, may be adopted as the product's EF value.

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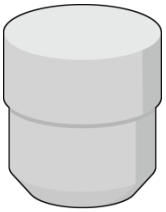
<Example>

Product	Regular product	Refill product	Weighted average
			EF=(10*40*100 + 2*40*300)/ (40*100 + 40*300) = 4
Weight of content	40 g	40 g	
Sales quantity	100 p	300 p	
EF	10	2	**4**

2-4 Life cycle perspective

The EF of a product considers all stages of the product life cycle as follows:

- Raw material procurement stage
- Manufacturing stage
- Distribution stage
- Use & maintenance stage
- End-of-life stage

The recycling and selling process are excluded from the system boundary.

2-5 Inventory analysis and database

Environmental inventory analysis shall be carried out based on primary data and some appropriate secondary data. The following databases are recommended for EF inventory analysis.

- IDEA[4)]
- Ecoinvent[5)]
- Japanese public database for the CFP program[6)]
- The basic unit database for the evaluation of organizational greenhouse gas emissions throughout the value chain[7)]
- WaterStat[8)]
- Water Footprint Inventory Database[9)]
- Electric power consumption rate, provided by power companies

2-6 Environmental impact categories and models on impact assessment

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The table below shows default impact categories with respective indicators and impact assessment models.

Impact category	Indicators	LCIA model
Climate change	kg-CO_2 equivalent	Bern model – Global Warming Potentials (GWP) over a 100 year time horizon[10]
Water resource consumption	m^3-H_2O equivalent	(1) AWARE[11] (2) Water Unavailability Factor[12]
Water pollution (Aquatic eutrophication)	ThOD (≈ COD) Fresh water: kg-P equivalent Marine: kg-N equivalent	

3. Methodological framework

3-1 Common application to all stages

3-1-1 Data collection

- Primary data shall be collected on unit processes that have a large effect on the whole product life cycle.
- Secondary data is permitted for unit processes with less influence.
- The activities of indirect departments such as the headquarters and research departments are not included in the evaluation. If it is difficult to extract the activities of indirect departments from the whole, indirect departments may be included.
- Capital goods such as facilities for producing products are not subject to evaluation.
- Items that are used repeatedly are not subject to evaluation.
- Regional differences should be taken into consideration based on primary data on each area.

3-1-2 Period of data collection

- The actual measurement data should be the average value of one year.
- The influence of seasonal fluctuations is eliminated by collecting annual data.
- When the annual average value is not adopted, the data validity and the reliability of the evaluation shall be verified and accounted for.

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- In cases in which data has large annual variations such as the amount of agricultural harvesting, average values over several years should be used in accordance with the objective.

3-1-3 Allocation

- If it is difficult to collect data for each product or unit process respectively, the data collected or the calculation result based on that data may be allocated according to the physical quantity such as weight ratio, volume ratio and number ratio.
- In case another approach is taken for allocation, the validity of this approach shall be explained.

3-1-4 Transportation

- All inter-site transport (one way transport) shall be accounted for.
- Primary data should be collected as much as possible and should be calculated based on the following method:
  - ✓ Fuel consumption method
  - ✓ Fuel efficiency method
  - ✓ Ton-kilometer method
- The details of each method can be found in Annex B.

3-1-5 Evaluation on waste treatment

- For waste discharged at each stage, the EF associated with waste treatment and transportation from the source to the final disposal site shall be calculated at each stage.
- The waste shall be treated according to the scenario detailed in Annex E, based on material type.
- In case the evaluation is based on climate change, CO_2 emissions released from the carbon in material molecules shall be included. However, CO_2 generated from biomass-derived materials should not be considered (=carbon neutral).
- For waste materials to be recycled, the EF related to transportation to the treatment site and the preparation process for recycling shall be calculated.
- The reduction effect on EF due to recycling shall not be included in the End-of-life stage.
- If waste is sold as a valuable material, it is excluded from evaluation.

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3-1-6 Cut-off

- In principle, cut-off shall not be permitted for each process of the manufacturing stage and the use & maintenance stage.
- The EF of materials and processes which contribute less to the entire EF can be cut off* with specification.
- The total cut off EF shall be less than 5% of the total EF.
- The calculated EF shall be rebated by the ratio to the entire EF.

3-2 Raw material procurement stage

3-2-1 Scope

The manufacturing stage covers processes included in the following items:

- Resource mining, cultivation, and breeding processes related to raw material production
- Procurement transportation to the manufacturing stage
- Treatment of waste and wastewater generated from the raw material procurement stage
- If there are processes other than the above, the process should be also included in the data collection scope.

3-2-2 Data collection

In the raw material procurement stage, data items to be collected are shown in the table below.

Items	Primary data	Either will do	Secondary data
1. Procurement volume such as weight, quantity, and cost of raw materials for each supplier input to product manufacturing	*✓	*✓	
2. EF related to the production of ingredients		✓	
3. EF related to the production of packaging materials		✓	
4. EF related to the production of accessories (manuals, utensils, etc.)		✓	

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5. EF related to fuel consumption in procurement transportation to the production site		✓	
6. EF related to consumption of transportation materials in procurement transportation to the production site		✓	
7. EF related to waste generation in procurement transportation to the production site		✓	
8. EF related to waste treatment in procurement transportation to the production site		✓	
9. Amount of agricultural products and other biomass-derived materials put into products		✓	
10. Amount of fresh water resource to be used for cultivation		✓	
11. Water consumption for cultivating agricultural products and biomass-derived materials used for product from each water source		✓	
12. EF related to the fuel and energy supply which is procured through a public service			✓
13. EF related to the fuel and energy supply which is generated on-site or is not prepared in 2-6 databases (e.g. green power, etc.)		✓	

3-2-3 Method and conditions of primary data collection

- When procuring recycled materials or reused materials, EF associated with the process after the preparation stage of recycling or reuse shall be included.
- In cases where the same raw materials are procured by multiple suppliers, it is desirable to collect primary data for all suppliers. If it is impossible to collect data from all suppliers, primary data shall be collected for the top 50% of the total procurement amount.

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- For procurement sources that cannot collect data, the weighted average value based on the procurement amount of the supplier which provided information may be used as secondary data.
- In cases where the suppliers are different for each production site, the primary data on the production site producing the target product shall be collected.
- The primary data measurement method for the raw material manufacturing process should be selected from the following four methods.
  (A) Method of totalizing the input/output amount of items for each operation unit (unit operating time, one lot, etc.) of facilities required for executing the process
  *e.g. (Equipment operation time) * (Power consumption rate of equipment) = (Power consumption)*
  (B) Method of allocating actual values for a certain period of time at production sites among products
  e.g. Total fuel input per year allocated among products
  (C) Combined use of (A) and (B)
- Procurement volume may be substituted for input quantity.
- On the evaluation of GHG emissions, if it is difficult to obtain primary data and to find appropriate secondary data, a value of 5.0 kg-CO2e/kg shall be applied in order to avoid underestimation due to missing data.
- The EF related to packaging material (EF_{pm}) in the procurement stage should be calculated based on the weight preferentially with the following equation:

  $EF_{pm} = \Sigma (W * (G_m + G_p + G_t * D_t * 10^{-3}))$

  W: Weight of the parts [kg]
  G_m: Unit EF corresponding to the material of the parts
  G_p: Unit EF corresponding to the process such as molding, printing, etc.
  G_t: Unit EF corresponding to the transportation method
  D_t: Transportation distance [km]
- In case of product EF evaluation, primary data related to the procurement volume shall be used. In the evaluation of organizational EF, if it is difficult to identify the weight of packaging materials, the average value of the same kind of packaging materials may be adopted.
- In the evaluation of auxiliary materials, the calculation based on the payment amount may be adopted.

3-2-4 Scenario on procurement transportation

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- For transportation and transportation materials used in the transportation process, it is desirable to collect primary data.
- If it is difficult to collect primary data, the scenario in Annex C may be used.

3-2-5 Classification on evaluation of Scope 3 GHG emissions

- GHG emissions related to cradle-to-gate such as sourcing, material production, cultivation, purification, etc. shall be classified as category 1.
- GHG emissions related to procurement logistics shall be classified as category 4.

3-3 Manufacturing stage

3-3-1 Scope

The manufacturing stage covers the processes included in the following items:

- Product manufacturing
- Production and transportation of auxiliary materials to be put into the manufacturing stage
- Treatment of waste and wastewater generated from the manufacturing stage
- If there are processes other than the above, the process should be also included in the data collection scope.

3-3-2 Data collection

In the manufacturing stage, the data items to be collected are shown in the table below.

Items	Primary data	Either will do	Secondary data
1. Input of water *Water which is part of the content shall be treated as an ingredient in the raw material production stage.	✓		
2. Input of fuel and electric power	✓		
3. Input of auxiliary materials	✓		
4. The volume or amount of production	✓		
5. Waste and wastewater generation	✓		
6. Intermediate transport between sites	✓		

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7. EF related to water supply		✓	
8. EF related to the production of auxiliary materials		✓	
9. EF related to the process of waste and wastewater treatment from the manufacturing stage		✓	
14. EF related to the fuel and energy supply which is procured by a public service		✓	
15. EF related to the fuel and energy supply which is generated on-site or is not prepared in 2-6 databases (e.g. green power, etc.)			✓

3-3-3 Method and condition of primary data collection

- For products produced at multiple sites, primary data shall be collected for all sites, and a weighted average according to the quantity at each site shall be applied.
- The primary data measurement method for the manufacturing process should be selected from the following four methods:
  (A) Method of totalizing the input/output amount of items for each operation unit (unit operating time, one lot, etc.) of facilities required for executing the process
  *e.g. (Equipment operation time) * (Power consumption rate of equipment) = (Power consumption)*
  (B) Method of allocating actual value for a certain period of time at production site among products
  e.g. Total fuel input per year allocated among products
  (C) Combined use of (A) and (B)
- When measurement method (A) is adopted, the EF shall be appropriately allocated according to the method of (3-1-3).
- When measurement method (C) is adopted, missing records or double accounting shall be prevented in the evaluation of each process.
- The primary data on GHG emissions related to waste from the manufacturing stage shall be evaluated according to the following two methods:
  (A) GHG emissions are calculated from the stoichiometric relationship, assuming that all carbon atoms constituting the components are

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discharged as CO_2 by incineration or wastewater treatment.

(B) Evaluate GHG emissions of products by measuring CO_2 emissions with a burning test for each raw material.

- When the molecule contains biomass-derived carbon, CO_2 generated from the biomass carbon should not be counted (carbon neutral).
- For evaluations on waste treatment or wastewater treatment from the manufacturing stage, EF related to the operation of waste treatment or wastewater treatment shall be included in the manufacturing stage.

3-3-4 Scenario on intermediate transportation

- For transportation and transportation materials used in the intermediate transportation process, it is desirable to collect primary data.
- If it is difficult to collect primary data, the scenario in Annex C may be used.

3-3-5 Classification on evaluation of Scope 3 GHG emissions

- GHG emissions associated with the combustion of fuel consumed in the site should be classified as Scope 1.
- GHG emissions related to the production of electric power consumed in the site, supplied by others, shall be classified as Scope 2.
- GHG emissions related to the production of fuel consumed in the site shall be classified as category 3.
- GHG emissions related to the offsite treatment of waste and wastewater discharged from the manufacturing stage shall be classified as category 5.

3-4 Distribution stage

3-4-1 Scope

The distribution stage covers the processes included in the following items:

- Shipping logistics
- Production and transportation of auxiliary materials to be put into the distribution stage
- Treatment of waste and wastewater generated from the distribution stage
- If there are processes other than the above, the process should be also included in the data collection scope.

3-4-2 Data collection

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In the distribution stage, the data items to be collected are shown in the table below.

Items	Primary data	Either will do	Secondary data
1. Product weight	✓		
2. Transportation quantity of products		✓	
3. Transport distance		✓	
4. Usage of transport materials		✓	
5. EF on production and transportation of transportation materials		✓	
6. Amount of waste generated in the distribution stage		✓	
7. EF related to the fuel and energy supply which is procured by a public service		✓	
8. EF related to the fuel and energy supply which is generated on-site or is not prepared in 2-6 databases. (e.g. green power, etc.)			✓
Fuel consumption method			
9. Fuel consumption	✓		
10. EF for each fuel type			✓
Fuel efficiency method			
11. Fuel efficiency	✓		
12. EF for each fuel type			✓
Ton-kilometer method			
13. Transportation method		✓	
14. Loading rate		✓	
15. EF related to loading rate and transportation means			✓

3-4-3 Method and condition of primary data collection

- The data collection method is not specified.

3-4-4 Scenario on procurement transportation

- If it is difficult to collect primary data, the scenario in Annex C may be used.

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3-4-5 Classification on evaluation of scope 3 GHG emissions

- GHG emissions related to the distribution shall be classified as category 4.

3-5 Use & maintenance stage

3-5-1 Scope

The use & maintenance stage covers all processes associated with use or maintenance of the product by the consumer. The concrete processes are as follows:

- Water supply for product use
- Energy or fuel consumption for product use
- Manufacturing of expendables for product use
- Treatment of waste, except for the product contents, generated from the use & maintenance stage
- Treatment of wastewater generated from the use & maintenance stage
- GHG emissions from the use of aerosol products
- If there are processes other than the above, the process should be also included in the data collection scope.

3-5-2 Data collection

In the use & maintenance stage, the data items to be collected are shown in the table below.

Items	Primary data	Either will do	Secondary data
1. Content volume, weight, amount	✓		
2. Content usage per 1 use		✓	
3. Power consumption per 1 use		✓	
4. Fuel consumption per 1 use		✓	
5. Water consumption per 1 use		✓	
6. Expendable consumption per 1 use		✓	
7. Amount of waste, except for the materials the product consists of, generated in the use & maintenance stage		✓	

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8. Amount of wastewater generated in the use & maintenance stage (= water consumption in the use & maintenance stage)		✓	
9. Amount of propellant released from the use of a aerosol product	✓		
10. Gas composition of a propellant		✓	
11. EF related to the production of expendables		✓	
12. EF related to the water supply for product use			✓
13. EF related to wastewater treatment from the use & maintenance stage		✓	
14. EF related to the fuel and energy supply which is procured by a public service			✓
15. Indirect global warming potential of LPG			✓10)

3-5-3 Method and condition of primary data collection

- EF of products that do not involve any consumption of power, fuel, water and expendables shall be evaluated as no impact.
- Usage times should be calculated according to the following formula:
  (Usage times) = (Product content weight) / (Usage weight per 1 use)
- Primary data shall be collected based on the scenario in Annex D.
- For aerosol products that emit GHG as a propellant, GWP shall be included in the scope.
- For aerosol products that emit LPG as a propellant, indirect GWP of LPG10) shall be included in the scope.
- The processes on treatment of waste containers and waste accessories, consisting the product, are excluded from the data collection items at the use & maintenance stage so as to be grasped at the end-of-life stage.

3-5-4 Scenario on product use

- Usage scenarios for each product category are listed in Annex D.

3-5-5 Classification on evaluation of scope 3 GHG emissions

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- GHG emissions related to the production of consumables, electric power, fuel, and tap water consumed with product use shall be classified as category 11.
- GHG emissions related to the combustion of fuel consumed with product use shall be classified as category 11.
- GHG emissions related to the treatment process of wastes and waste water, which do not constitute the product, generated from the use stage shall be classified as category 11.

3-6 End-of-life stage

3-6-1 Scope

The End-of-life stage covers the processes included in the following items:

- Degradation of content
- Collection and transport of waste derived from product packaging and accessories
- Incineration and landfill treatment of waste derived from product packaging and accessories
- Pre-recycling process (up to the preparation stage for recycling)
- If there are processes other than the above, the process is also included in the calculation scope.

3-6-2 Data collection

In the end-of-life stage, the data items to be collected are shown in the table below.

Items	Primary data	Either will do	Secondary data
1. GHG emissions due to degradation of content, packaging, accessories	✓		
2. Amount of ThOD due to degradation of content	✓		
3. Amount of N due to degradation of content	✓		
4. Amount of P due to degradation of content	✓		
5. Amount of waste packaging, waste accessories, waste transport materials	✓		

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6. Transportation method to treatment			✓
7. Transport distance to treatment facility			✓
8. EF related to transportation to treatment facilities			✓
9. Amount of waste to be incinerated			✓
10. Amount of waste to be landfilled			✓
11. EF related to waste treatment			✓
12. EF related to recycling pretreatment (e.g. washing, making bale, etc.)			✓

3-6-3 Method and condition of primary data collection

- The primary data on GHG emissions related to degradation of content shall be evaluated according to the following two methods:
  (A) GHG emissions are calculated from the stoichiometric relationship, assuming that all carbon atoms of the components are discharged as CO_2 by incineration or wastewater treatment.
  (B) GHG emissions of products are evaluated by measuring CO_2 emissions from burnings tests for each raw material.
- When the molecule contains biomass-derived carbon, carbon derived from the biomass should not be counted (carbon neutral).

3-6-4 Scenario on transportation and waste treatment

- For transportation to treatment facilities, the scenario in Annex C shall be applied uniformly.
- For waste treatment at treatment facilities, the scenario in Annex F shall be applied uniformly.
- The released amount of ThOD, N and P may be calculated with the following equation:
  (Released amount) = (Actual amount) * (1 - (Penetration rate of the sewage treatment plant in the area where the product is used))

3-6-5 Classification on the evaluation of scope 3 GHG emissions

- GHG emissions related to the treatment process of waste from the product shall be classified as category 11.
- GHG emissions such as CO_2 and CH_4 emitted from the carbon molecules of the

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product's materials by microbial degradation or combustion shall be classified as category 12.

3-7 Other activities

3-7-1 Scope

Evaluation of other activities is for organizational LCA or the evaluation of scope 3 GHG emissions. Other activities cover the processes included in the following items:

- Investment for capital goods
- Business travel
- Commuting

3-7-2 Data collection

In the end-of-life stage, the data items to be collected are shown in the table below.

Items	Primary data	Either will do	Secondary data
Scope 3, Category 2: Investment for capital goods			
1. Capital investment in innovation centers and production sites	✓		
2. Types and amount of materials used for the construction of buildings	✓		
3. If it is difficult to obtain data for 2., the results will be gotten from CASBEE.	✓		
4. Total floor area and useful lifetime	✓		
5. EF related to the production of capital goods such as productive facilities and buildings		✓	
Scope 3, Category 6: Business travel			
6. Expenditure on business travel	✓		
7. Destinations of business trips	✓		
8. Number of business trips for each destination	✓		
9. Means of transportation on business	✓		

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10. EF related to transportation		✓	
Scope 3, Category 7: Commuting			
11. Expenditure on commuting	✓		
12. Means of transportation for commuting	✓		
13. EF related to transportation		✓	

3-7-3 Classification on evaluation of scope 3 GHG emissions

- GHG emissions related to investment for capital goods shall be classified as category 2.
- GHG emissions related to business travel shall be classified as category 6.
- GHG emissions related to commuting shall be classified as category 7.

4. References

1) ISO 14040 (2006) Environmental Management - Lifecycle Assessment - Principles and Framework
2) ISO 14044 (2006) Environmental Management - Lifecycle Assessment - Requirements and Guidelines
3) The Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2010): http://www.ghgprotocol.org/sites/default/files/ghgp/standards/Corporate-Value-Chain-Accounting-Reporing-Standard_041613_2.pdf
4) Inventory Database for Environmental Analysis (IDEA): http://idea-lca.com/
5) Ecoinvent: http://www.ecoinvent.org/
6) Japanese public database for CFP program: https://cfp-japan.jp/calculate/verify/data2010.html
7) Ministry of the Environment, government of Japan, The basic unit database for evaluation of organizational greenhouse gas emissions throughout value chain: http://www.env.go.jp/earth/ondanka/supply_chain/gvc/files/tools/DB_v2.3_r.pdf
8) WaterStat: http://waterfootprint.org/en/resources/water-footprint-statistics/
9) Y. Ono, K. Horiguchi and N. Itsubo (2013) Development of Water Footprint Inventory Database Using Input-Output Analysis in Japan, The Institute of Lifecycle Assessment, Japan, 9(2), 108-115
10) IPCC Fourth Assessment Report: Climate Change 2007

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11) Boulay, A.-M., J. Bare, L. Benini, M. Berger, M. J. Lathuillière, A. Manzardo, M. Margni, M. Motoshita, M. Núñez, A. V. Pastor, B. Ridoutt, T. Oki, S. Worbe and S. Pfister (2017) The WULCA consensus characterization model for water scarcity footprints: assessing impacts of water consumption based on available water remaining (AWARE), *The International Journal of Life Cycle Assessment*: 1-11.
12) S. Yano, N. Hanasaki, N. Itsubo and T. Oki (2015) Water Scarcity Footprints by Considering the Differences in Water Sources, *Sustainability*: 7(8), 9753-9772
13) Product category rules of carbon footprint communication program for glass containers (PA-BE-03): https://www.cfp-japan.jp/common/pdf_authorize/000184/PA-BE-03.pdf
14) Product category rules of carbon footprint communication program for plastic containers (PA-BC-02): https://www.cfp-japan.jp/common/pdf_authorize/000058/PA-BC-02.pdf
15) Ministry of the Environment, Japan (2006) Survey on actual waste disposal business in Japan: http://www.env.go.jp/recycle/waste_tech/ippan/index.html
16) Product category rules of carbon footprint communication program for paper containers (PA-BB-01): https://www.cfp-japan.jp/common/pdf_authorize/000028/PA-BB-01.pdf

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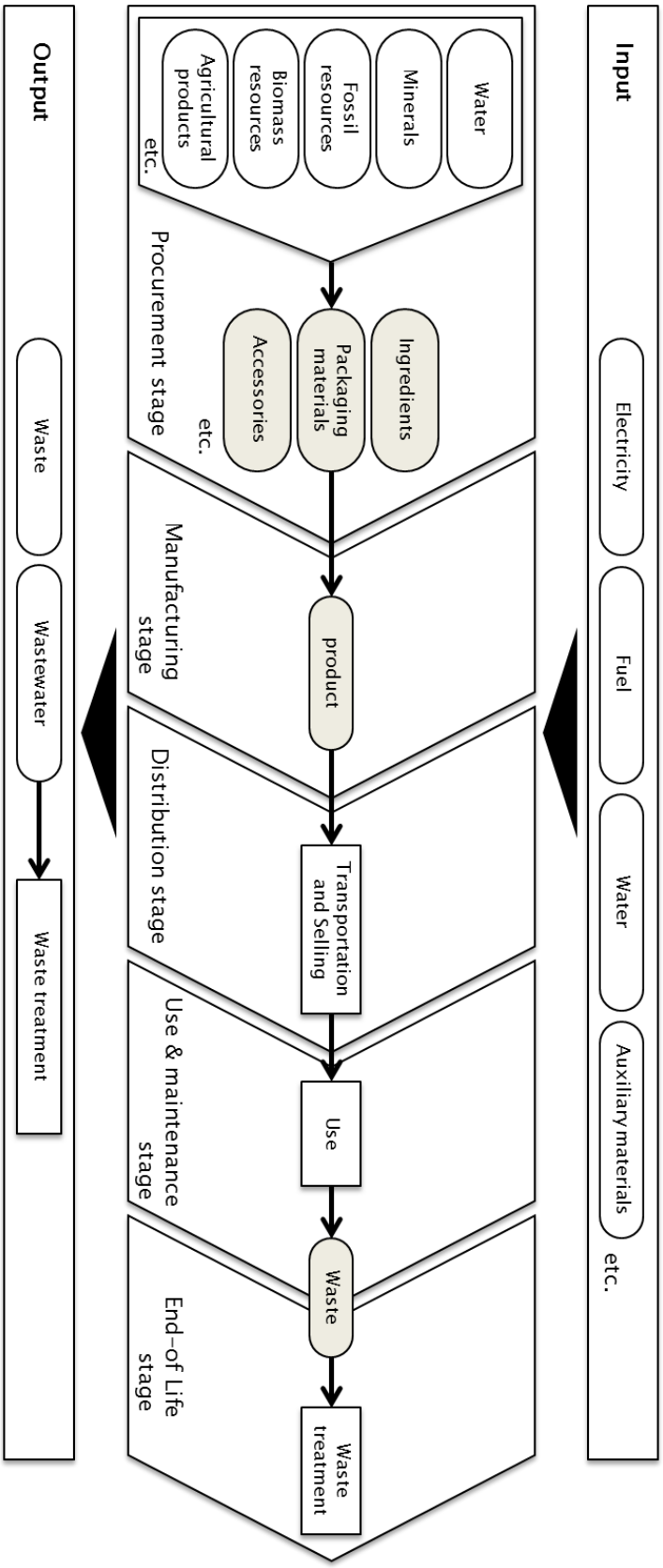
Annex A: Life cycle flow diagram



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Annex B: Method of evaluating EF due to fuel consumption during transportation

B-1 Fuel consumption method

(1) Collect the amount of fuel used for each transportation means.

(2) EF is calculated by multiplying the amount of fuel and the EF factor related to supply and use of the fuel (secondary data).

B-2 Fuel efficiency method

(1) Calculate the average fuel efficiency by fuel consumption and transport distance within the specified period.

(2) EF is calculated by multiplying the fuel efficiency, the transport distance related to product distribution and the EF factor related to supply and use of the fuel (secondary data).

B-3 Ton-kilometer method

(1) Collect the loading rate [%] for each means of transportation and the transport load (transport ton-kilometer) [t · km].

(2) EF is calculated by multiplying product weight, transport distance and the EF factor according to the transport load of each transport means (secondary data).

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Annex C: Scenario for transportation

Transport scenarios for each stage in cases where primary data can not be collected are shown below. They apply to each transportation process for the raw material procurement stage, the manufacturing stage, the distribution stage and the end-of-life stage.

C-1 Transport distance

This guide uses a longer transport distance than average in order to raise the incentive for primary data collection.

<Examples>

(1) Transportation within the prefecture: 100 km
(2) Inter-prefecture transportation: 1.5 times of the actual inter prefecture distance
(3) Transportation of procurement (from supplier to production site) : 500 km
(4) Shipment logistics for domestic market in U.S. and China: 2,000 km
(5) Shipment logistics for domestic market, when the consumption area is not limited to a specific area: 1,000 km
(6) International transportation:

(7-1) Land transportation

- If the departure country and arrival country are connected by land, the land transport distance is shorter than the distance by ship, and the land transport distance is 2000 km or less, land transportation will be selected.
- Transportation in departure country: 1,000 km
- Transportation in arrival country: refer to (1) - (5)

(7-2) Marine transportation

- Transportation from the production site to the port of the producing country: 10 km
- Transportation from the port of the producing country to the port of arrival country (= consuming country): refer to the "Inter-country/Region Distance Database"
- Transportation in arrival country: refer to (1) - (5)

(7) Transportation of waste collection: 100 km (one way transport)

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C-2 Transport method

In principle, truck transport is adopted as the basic transport method in order to raise the incentive for primary data collection and reduction of CO_2 emissions by modal shift.

<Examples>

(1) Transportation by logistics operator: 10 ton trucks
(2) Transportation by other businesses (producers, etc.): 2 ton trucks
(3) International shipment: Container ships (less than 4000 TEU)
(4) Transportation of waste collection: 2 ton trucks

C-3 Loading factor

A scenario with a lower loading rate than average was adopted in order to raise the incentive for primary data collection.

<Example>

50 %

C-4 Transport materials

A scenario with more transportation materials than average was adopted in order to raise the incentive for primary data collection.

<Example>

(1) Transportation for raw material procurement: 71.3 g/kg of tinplate and 33.5 g/kg of cardboard
(2) Transportation for packaging material procurement: 0.5 g/g of cardboard and 0.01 g/g of polyethylene sheets
(3) Intermediate transportation in the manufacturing stage: 71.3 g/kg of tinplate and 33.5 g/kg of cardboard
(4) Transportation for shipping: Using cardboard with weight of 50% of product weight

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Annex D: Scenario for use conditions

Use conditions per 1 use of product which requires the consumption of energy, fuel, water and expendables are described below:

(1) Skincare lotion

Scenario	Use 1 sheet of cotton (=0.74 g) per 1 use.		
Content usage	2.0 mL	Room temperature	– ˚C
Expendables	Cotton sheet	Amount of exp.	0.72 g

(2) Skincare emulsion

Scenario	Use 1 sheet of cotton (=0.74 g) per 1 use.		
Content usage	1.5 mL	Room temperature	– ˚C
Expendables	Cotton sheet	Amount of exp.	0.72 g

(3) Makeup cleansing oil

Scenario	After use, rinse off with 4.5 L of water or hot water. In calculating the EF related to water consumption, the temperature is set at 33.1 ˚C according to the results of an internet survey on consumer behaviors*.		
Content usage	3.0 mL	Room temperature	17 ˚C
Water consumption	4.5 L	Water temperature	33.1 ˚C
Electricity	0.00030 kWh	City gas	0.0067 Nm^3

*The survey results showed that the respondents rinsed 7 times with hot water and 3 times with lukewarm water.

(4) Face wash

Scenario	After use, rinse off with 4.5 L of water or hot water. In calculating the EF related to water consumption, the temperature is set at 33.1 ˚C according to the results of an internet survey on consumer behaviors.		
Content usage	1 g	Room temperature	17 ˚C
Water consumption	4.5 L	Water temperature	33.1 ˚C
Electricity	0.00030 kWh	City gas	0.0067 Nm^3

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(5) Face wash (Foaming type)

Scenario	After use, rinse off with 4.5 L of water or hot water. In calculating the EF related to water consumption, the temperature is set at 33.1 ˚C according to the results of an internet survey on consumer's behavior.		
Content usage	2.5 mL	Room temperature	17 ˚C
Water consumption	4.5 L	Water temperature	33.1 ˚C
Electricity	0.00030 kWh	City gas	0.0067 Nm^3

(6) Face wash (Easy rinse-off type)

Scenario	After use, rinse off with 4.5 L of water or hot water. In calculating the EF related to water consumption, the temperature is set at 33.1 ˚C according to the results of an internet survey on consumer's behavior.		
Content usage	2.5 mL	Room temperature	17 ˚C
Water consumption	2.7 L	Water temperature	33.1 ˚C
Electricity	0.00030 kWh	City gas	0.0067 Nm^3

(7) Soap

Scenario	This scenario assumes hand washing. 10 L of tap water is consumed for rinsing off per 1 use (30 seconds).		
Content usage	0.7 g	Room temperature	17 ˚C
Water consumption	10 L	Water temperature	17 ˚C
Electricity	- kWh	City gas	- Nm^3

(8) Soap as a hotel amenity

Scenario	It is assumed that 10 % of the contents are used for washing the hands and body, and 90 % remains. The remaining soap is discarded (Shiseido survey). 100 L of 40 ˚C water is consumed for washing on an overnight stay.		
Content usage	Whole amount	Room temperature	17 ˚C
Water consumption	100 L	Water temperature	40 ˚C
Electricity	0.13 kWh	City gas	0.30 Nm^3

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(9) Eco-soap as a hotel amenity

Scenario	It is assumed that 10 % of the contents are used for washing the hands and body, and 90 % remains. The remaining soap is discarded (Shiseido survey). 100 L of 40 ˚C water is consumed for washing on an overnight stay.		
Content usage	Whole amount	Room temperature	17 ˚C
Water consumption	100 L	Water temperature	40 ˚C
Electricity	0.13 kWh	City gas	0.30 Nm^3

(10) Shampoo, Hair conditioner and Body shampoo

Scenario	After use, rinse off with 15 L of 40 ˚C water.		
Content usage	6.0 mL	Room temperature	17 ˚C
Water consumption	15 L	Water temperature	40 ˚C
Electricity	0.0020 kWh	City gas	0.44 ^{3}

(11) Bathwater additive

Scenario	Add specified amount to hot water in bathtub.		
Content usage	25 mL	Room temperature	17 ˚C
Water consumption	200 L	Water temperature	40 ˚C
Electricity	0.027 kWh	City gas	0.59 Nm^3

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Annex E: Scenario for waste treatment

The following scenario should be adopted for the method of waste treatment (waste containers, waste accessories, waste transport materials, etc.) sent to the processing facility, depending on the type of waste materials. In the case where it is difficult to specify the type and composition ratio of waste materials, the scenario "E.6 Other Waste" may be adopted.

E-1 Glass

The glass waste treatment scenario, taken from PCR (PA-BE-03)[13] of the carbon footprint program for glass container packaging in Japan, is shown below.

- 53.1 % is recycled as cullet.
- 13.4 % is recycled as a raw material for other uses.
- 15.3 % undergoes intermediate treatment and is landfilled.
- 18.2 % is directly landfilled.

E-2 Plastic

The plastic waste treatment scenario, taken from PCR (PA-BC-02)[14] of the carbon footprint program for plastic container packaging in Japan, is shown below.

- 62 % is incinerated.
- 16 % is landfilled directly.
- 22 % is recycled.

*GHG emissions from the plastics of sold products and disposal treatment of them were calculated under the following scenario until FY2017, on Scope 3 evaluation.

- 92 % is incinerated.
- 3 % is landfilled directly.
- 5 % is recycled.

E-3 Paper

The paper waste treatment scenario, taken from PCR (PA-BB-01)[16] of the carbon footprint program for paper container packaging in Japan, is shown below.

- 96 % is incinerated.
- 4 % is recycled.

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CO_2 from the release of carbon-constituting paper molecules is not counted, because paper is considered to be a 100 % biomass-derived material (carbon neutral).

E-4 Cardboard

The cardboard waste treatment scenario, taken from PCR (PA-BB-01)[16] of the carbon footprint program for paper container packaging in Japan, is shown below.

- 4 % is incinerated.
- 96 % is recycled.

E-5 Metal

- 100 % is landfilled.

E-6 Other waste

The other waste treatment scenario, taken from the report "Survey on actual waste disposal business in Japan (2006, Ministry of the Environment, Japan)"[15] , is shown below.

- 92 % is incinerated.
- 3 % is landfilled directly.
- 5 % is recycled.

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