

Note: This document is reference purpose only during TOR discussion.

Product Category Rules (PCR)
for
Vehicles

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1 Goal and scope

1.1 Goal

The purpose of this PCR is to identify rules, requirements, and instructions for CFP quantification and declaration covering “vehicles”. Regarding any matters that may conflict with relevant laws and regulations of the subject product, compliance with such laws and regulations shall be given priority.

1.2 Definition of the product category

This PCR is for “vehicles”. For convenience, vehicles are classified into three types (light-duty vehicles, heavy-duty vehicles, and two-wheeled motorcycles), and the products, fuels used, and drive systems for each are as shown in the table below. Here, vehicles that use gasoline, diesel oil, and natural gas as a single fuel are abbreviated as GV, DV, and CNGV, respectively. Hybrid electric vehicles are abbreviated as HEV, plug-in hybrid vehicles as PHEV, pure electric vehicles as BEV, and fuel cell vehicles as FCEV.

		Light-duty vehicle	Heavy-duty vehicle	Two-wheeled motorcycle
Product		Passenger car (9 persons or less)	Truck (more than 3.5 t)	Motorcycle (250 cc or less)
		Truck (3.5 t or less)	Bus	Motorcycle (more than 250 cc)
Fuel / drive system	GV	X		X
	DV	X	X	
	CNGV	X	X	
	HEV	X	X	X
	PHEV	X	X	X
	BEV	X	X	X
	FCEV	X	X	X

1.3 Components to be covered

The product (vehicle) to be covered shall include the following components:

- Main body (including fuel in vehicles with internal combustion engines)
- Accessories: spare tire, spare disc wheel, tools, triangular indicator plate, floor mat
- Maintenance parts (components): tire, lead-acid battery, oil filter, air cleaner element, fuel filter, timing belt, spark plug, disc pad, brake shoe
- Maintenance parts (fluids): engine oil, brake fluid, LLC, air conditioner refrigerant

1.4 Functional unit and reference flow

The function of a vehicle is to move a person(s) or a person(s) and objects on the road by means of a prime mover. Therefore, the functional unit is defined as “to travel the distances as shown in the table below at the prescribed certified fuel consumption or electricity consumption (see Section 4.4.2)”, and the reference flow is “one vehicle” which fulfills the defined functional unit.

Light-duty vehicle		Heavy-duty vehicle		Two-wheeled motorcycle	
Passenger car (9 persons or less)	xx0,000 km (xx year)	Truck (more than 3.5 t)	xx0,000 km (xx year)	Motorcycle (250 cc or less)	xx0,000 km (xx year)
Truck (3.5 t or less)	xx0,000 km (xx year)	Bus	xx0,000 km (xx year)	Motorcycle (more than 250 cc)	xx0,000 km (xx year)

1.5 System boundary

The following life cycle stages are covered:

- Material production stage
- Parts production and vehicle assembly stage
- Use stage
- End-of-life stage

The following loads are subject to cut-off:

- Loads other than during the use of capital goods such as facilities to produce products
- Loads associated with the construction of production plants, etc.
- Loads from containers, packaging and transport materials used when inputs are procured from external sources
- Loads from secondary materials such as masks, gloves, and other general-purpose goods
- Loads on indirect departments such as administrative and research departments

The life cycle flow is shown in Appendix Figure 1.

1.6 Environmental impact category

Since this PCR provides for the calculation and declaration of CFP, it only covers quantification of climate change.

2 Normative References

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document:

- ISO 14040:2006 Environmental management — Life cycle assessment — Principles and framework
- ISO 14044:2006 Environmental management — Life cycle assessment — Requirements and guidelines
- ISO 14067:2018 Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification
- Japan EPD Program by SuMPO, Quantification and Declaration Rules (General Rules and Requirements)
- Zampori, L. and Pant, R., Suggestions for updating the Product Environmental Footprint (PEF) method, EUR 29682 EN, Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-00654-1, doi:10.2760/424613, JRC115959

3 Terms and Definitions

3.1 Vehicle

(1) Passenger car

A motor vehicle which, on account of its design and appointments, is intended mainly for carrying persons and their luggage and/or goods, and which has available a maximum of nine seating places, including the driving seat. [Source: ISO 3833:1977, 3.1.1]

(2) Bus

A motor vehicle which, on account of its design and appointments, is intended for carrying persons and luggage, and which has more than nine seating places, including the driving seat. [Source: ISO 3833:1977, 3.1.2]

(3) Truck

A motor vehicle which, on account of its design and appointments, is used mainly for conveying goods. [Source: ISO 3833:1977, 3.1.3]

(4) Hybrid electric vehicle

Vehicle with both a rechargeable energy storage system (RESS) and a fuelled power source for propulsion. [Source: ISO/TR 8713:2019, 3.79]

(5) Plug-in hybrid electric vehicle

HEV with a rechargeable energy storage system (RESS) that is intended to be charged from an external electric energy source. [Source: ISO/TR 8713:2019, 3.62]

(6) Electric vehicle

Vehicle with one or more electric drive(s) for vehicle propulsion. [Source: ISO/TR 8713:2019, 3.46]

(7) Fuel cell vehicle

Electrically propelled vehicle with a fuel cell system as the power source for vehicle propulsion. [Source: ISO/TR 8713:2019, 3.71]

(8) Original equipment manufacturer (OEM)

In the automotive industry, this term generally refers to automotive manufacturers. [Source: IATF 16949:2016]

(9) End-of-life vehicle (ELV)

A vehicle which is waste. [Source: Directive 2000/53/EC, Article 2(1)]

(10) Automobile shredder residue (ASR)

Waste remaining after removing airbags, fluorocarbons, doors, engines, and other parts from end-of-life vehicles and shredding them to recover useful metals.

3.2 Carbon footprint

(1) Carbon footprint of a product (CFP)

Sum of GHG emissions and GHG removals in a product system, expressed as CO₂ equivalents and based on a life cycle assessment using the single impact category of climate change. [Source: ISO 14067:2018, 3.1.1.1]

(2) CFP declaration

Declaration of the CFP made according to CFP-PCR developed specifically for CFP communication, or relevant Type III environmental declaration PCR.

3.3 Greenhouse gas

(1) Greenhouse gas (GHG)

Gaseous constituent of the atmosphere, both natural and anthropogenic, that absorbs and emits radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere and clouds. For a list of GHGs, see the latest Intergovernmental Panel on Climate Change (IPCC) Assessment Report. [ISO14064-1:2018, 3.1.1]

(2) Greenhouse gas source (GHG source)

Process that releases a GHG into the atmosphere. [Source: ISO 14064-1:2018, 3.1.2]

(3) Greenhouse gas emission (GHG emission)

Release of a GHG into the atmosphere. [Source: ISO 14064-1:2018, 3.1.5]

(4) Greenhouse gas emission factor (GHG emission factor)

Coefficient relating GHG activity data with the GHG emission. [Source: ISO 14064-1:2018, 3.1.7]

(5) Global warming potential (GWP)

Index, based on radiative properties of GHGs, measuring the radiative forcing following a pulse emission of a unit mass of a given GHG in the present-day atmosphere integrated over a chosen time horizon, relative to that of carbon dioxide (CO₂). [Source: ISO 14064-1:2018, 3.1.12]

(6) Carbon dioxide equivalent (CO₂e)

Unit for comparing the radiative forcing of a GHG to that of carbon dioxide. The carbon dioxide equivalent is calculated using the mass of a given GHG multiplied by its global warming potential. [Source: ISO 14064-1:2018, 3.1.13]

3.4 Product, product system, and process

(1) Process

Set of interrelated or interacting activities that transforms inputs into outputs. [Source: ISO 14044:2006, 3.11]

(2) Functional unit

Quantified performance of a product system for use as a reference unit. [Source: ISO 14044:2006, 3.20]

(3) System boundary

Set of criteria specifying which unit processes are part of a product system. [Source: ISO 14044:2006, 3.32]

(4) Reference flow

Measure of the outputs from processes in a given product system required to fulfil the function expressed by the functional unit. [Source: ISO 14044:2006, 3.29]

(5) Elementary flow

Material or energy entering the system being studied that has been drawn from the environment without previous human transformation, or material or energy leaving the system being studied that is released into the environment without subsequent human transformation. [Source: ISO 14044:2006, 3.12]

(6) Product category rules (PCR)

Set of specific rules, requirements and guidelines for developing Type III environmental declarations for one or more product categories. [Source: ISO 14025:2006, 3.5]

(7) Carbon footprint of a product – product category rules (CFP–PCR)

Set of specific rules, requirements and guidelines for CFP or partial CFP quantification and communication for one or more product categories. [Source: ISO 14067:2018, 3.1.1.10]

3.5 Life cycle assessment

(1) Life cycle

Consecutive and interlinked stages of a product system, from raw material acquisition or generation from natural resources to final disposal. [Source: ISO 14044:2006, 3.1]

(2) Life cycle assessment (LCA)

Compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle. [Source: ISO 14044:2006, 3.2]

(3) Life cycle inventory analysis (LCI)

Phase of life cycle assessment involving the compilation and quantification of inputs and outputs for a product throughout its life cycle. [Source: ISO 14044:2006, 3.3]

(4) Life cycle impact assessment (LCIA)

Phase of life cycle assessment aimed at understanding and evaluating the magnitude and significance of the potential environmental impacts for a product system throughout the life cycle of the product.

[Source: ISO 14044:2006, 3.4]

3.6 Data and data quality

(1) Primary data

Quantified value of a process or an activity obtained from a direct measurement or a calculation based on direct measurements. [Source: ISO 14067:2018, 3.1.6.1]

(2) Site-specific data

Primary data obtained within the product system. All site-specific data are primary data but not all primary data are site-specific data because they may be obtained from a different product system. [Source: ISO 14067:2018, 3.1.6.2]

(3) Secondary data

Data which do not fulfil the requirements for primary data. Secondary data can include data from databases and published literature, default emission factors from national inventories, calculated data, estimates or other representative data, validated by competent authorities. [Source: ISO 14067:2018, 3.1.6.3]

(4) Default value

Average values that reflect the mainstream level of the industry. For example, material composition ratios for passenger cars, GHG emission factors for material production, and GHG emission factors for finished vehicle production.

4 Methodology of CFP Calculation

4.1 Items that apply to all stages in common

4.1.1 Data quality criteria and data collection methods

4.1.1.1 Scope of primary data collection

The scope of primary data collection is described in Sections 4.2.3, 4.3.3, 4.4.3, and 4.5.3. Primary data may also be collected as necessary for data collection items outside the scope of primary data collection.

4.1.1.2 Criteria for primary data quality

(1) Criteria on scope of time

In principle, it shall be within the previous year. Or, it shall be within a scope that is reasonably equivalent to the period.

(2) Criteria on scope of geography

Regional differences shall be considered, and appropriate calculations shall be done based on data from each region. However, if regional differences are very small or non-existent, then they do not need to be considered.

If the scope of primary data collection includes multiple sites, then primary data shall be collected using methods with low bias from sites which cumulatively comprise 50% or more of the production volume or acquisition volume of all sites. Or, it shall be within a scope that is reasonably equivalent.

(3) Criteria on scope of technology

It shall be the production technology of the applicable product. Or, it shall be production technology of similar products that is reasonably equivalent to the production technology of the applicable product.

(4) Criteria on reproducibility

The basis of data shall be clear.

(5) Exceptions in primary data quality criteria for raw materials if primary data is collected from suppliers

In principle, the criteria on scope of time shall be any one year within the previous x years. Or, it shall be within a scope that is reasonably equivalent to the period.

4.1.1.3 Primary data collection method

(1) Activity data, and factors to determine activity data

(a) Data collection using the process analysis method

Measurement shall be conducted using method A described below. If measurement using method A is difficult, then quantification may be performed using method B, or a hybrid of method A and B.

A) This method identifies and sums up the input volume and output volume of input/output items for each operational unit of work, equipment, and facilities that are necessary to perform a process (operation time, operation area, operation distance, etc.).

B) This method allocates actual values for a certain period between products, such as business units, building units, floor units, and line units.

(b) Other considerations for collection of data

Although actual measurements are prioritized in the collection of input/output flow data for each process, it is also acceptable to use designed values and planned values from product proposals, specification sheets, standard formula sheets, etc., and estimated values from processes of similar products. However, if designed values, planned values, or estimated values are used, then primary data quality criteria must be fulfilled.

The input amount of each input item for each process shall be quantified taking into consideration loss rates for each process. However, if it is not possible to perform realistic consideration of loss rates due to a large number of elements and processes for each input item, then these limits do not apply.

Data shall be collected based on the mass balance of each process regarding the output amount of wastes. However, if it is not possible to perform realistic collection of data based on the mass balance due to a large number of elements and processes for each input item, then allocation may be based on the generated volume of wastes of the whole plant.

(2) Emission factors

If emission factors are generated based on primary data, then the impacts associated with the treatment of wastes and wastewater generated during production, and the transport of these to treatment facilities, must be included in calculations, in addition to the impacts associated with input items.

Emission factors quantified based on primary data collected by businesses or partners in the supply chain may be used as primary data. However, primary data collected by businesses or partners in the supply chain must fulfill the primary data quality criteria in the previous section.

4.1.1.4 Criteria for secondary data quality

(1) Criteria on scope of time

If businesses collect data independently, then the data shall be from any one year within the previous five years. Or, it shall be within a period that is reasonably equivalent.

(2) Criteria on scope of technology

It shall be very similar to the production technology used for the product. Or, it shall be the production technology used for the product.

(3) Criteria on reproducibility

Sources of data shall be published. Publishing refers to normal publication, and also includes publication in books or journals, members-only publication, publication in software, etc.

4.1.1.5 Secondary data collection methods

Businesses can use “designated database data” as emission factors.

4.1.2 General rules of cut-off

Cut-off items described in this PCR can be cut off. In addition, cut-off criteria can be added by each quantified product during quantification based on the cut-off criteria specified below.

- a) Input of parts, materials, containers/packaging, and secondary materials shall cumulatively comprise no more than x% of the mass ratio of the reference flow. However, items with a small mass, which are assumed to have a big impact category indicator, must be included in the product system. (Example: Printed circuit boards for electronics)
- b) Output of substances and wastes shall cumulatively comprise no more than x% of the mass ratio of the reference flow. However, items with a small mass, which are assumed to have a big impact category indicator, must be included in the product system. Particular attention should be paid to direct emissions into the atmosphere, hydrosphere, etc. and to hazardous substances subject to control. (Example: refrigerant leaks from air conditioners, and nitrous oxide emissions from nitrogen fertilizers)
- c) Flows and processes which cannot be expressed in mass shall comprise no more than x% of the impact category indicator ratio. (Example: On-site transport processes)
- d) Other cases of scenarios which are difficult to describe in a coherent model due to a lack of reliable information. (Example: Construction and capital assets of production plants, indirect

departments)

4.1.3 General rules of allocation

If multiple products are generated from a process, then input/output flow must be allocated between the multiple products, and hence allocation must be performed according to the following step-by-step procedure.

- a) Step 1: Allocation should be avoided by using the following methods, if possible:
 - 1) Dividing the unit processes for allocation into two or more sub-processes, and collecting input/output flow data related to the sub-processes
 - 2) Expanding the product system to include additional functions related to co-products
- b) Step 2: If allocation cannot be avoided, then the system input/output flow should be divided, and allocation should be performed using a method that reflects the intrinsic physical relationships between different products and functions. Therefore, allocation should be performed based on the relationships of changes in input/output flow correlated to volume-related changes in the products and functions provided by the system. For example, allocation may be performed proportionally between co-products according to the mass of products, thermal values, quantity, and work area, etc.
- c) Step 3: If physical relationships are not sufficient to be used as the basis for allocation, then input/output flow should be allocated using a method that reflects the relationships between products and functions, and other factors. For example, allocation of environmental data for input/output flow may be performed proportionally between co-products according to the economic value of products. In some cases, if lightweight and high-added value products such as precious metals are mixed in, then it may be reasonable to allocate proportionally according to the monetary value.

4.1.4 Biomass

As a rule, CO₂ generated by combustion and biodegradation of biomass managed with sustainable methods, and biomass of reused materials like waste wood, is not recorded in impact category indicators for climate change. However, CO₂ emissions from input activity related to production and transport of biomass, and methane or other greenhouse gases generated by biodegradation shall be included in the product system.

4.2 Material production stage

4.2.1 Processes included in the scope of data collection

The following processes shall be covered:

[A1] Process of producing materials

[A2] Process of transporting, disposing of, and recycling waste materials generated during material production

4.2.2 Data collection items

The following data shall be collected:

[A1] Process of producing materials

- a) Parts other than those listed in b) and c) below

- Weight of each material
 - Yield rate of each material
 - GHG emission factor for producing each material
- b) Tire, lead-acid battery, electronic components, and CFRP
- Weight of part
 - GHG emission factor for producing part materials
- c) Lithium-ion battery
- Battery capacity
 - GHG emission factor for producing part materials

[A2] Process of transporting, disposing of, and recycling waste materials generated during material production

TBD

4.2.3 Primary data collection items

The following data shall be collected as primary data:

[A1] Process of producing materials

- a) Parts other than those listed in b) and c) below
- Weight of each material
- b) Tire, lead-acid battery, electronic components, and CFRP
- Weight of part
- c) Lithium-ion battery
- Battery capacity

[A2] Process of transporting, disposing of, and recycling waste materials generated during material production

TBD

4.2.4 Secondary data collection items

The following data shall be collected as secondary data. The default values in Appendix Figure 1 may be adopted, or data collected independently by the party performing the calculation may be used. In this case, the validity of their own data is subject to verification.

[A1] Process of producing materials

- a) Parts other than those listed in b) and c) below
- Yield rate of each material
 - GHG emission factor for producing each material
- b) Tire, lead-acid battery, electronic components, and CFRP
- GHG emission factor for producing part materials
- c) Lithium-ion battery
- GHG emission factor for producing part materials

[A2] Process of transporting, disposing of, and recycling waste materials generated during material production

TBD

4.2.5 Scenario

[A1] Process of producing materials

For parts corresponding to a), the material classifications shown in Appendix Table 1 shall be applied.

[A2] Process of transporting, disposing of, and recycling waste materials generated during material production

TBD

4.3 Parts production and vehicle assembly stage

4.3.1 Processes included in the scope of data collection

The following processes shall be covered:

[B1] Process of transporting materials

[B2] Process of producing parts

[B3] Process of assembling vehicle

[B4] Process of transporting parts

[B5] Process of transporting finished vehicle

[B6] Process of transporting, disposing of, and recycling waste materials generated during parts production

4.3.2 Data collection items

The following data shall be collected:

[B1] Process of transporting materials

- Vehicle weight
- GHG emission factor for transporting materials

[B2] Process of producing parts

- Consumption of each input energy in parts production
- GHG emission factor for producing each input energy in parts production
- GHG emission factor for burning each input energy in parts production

[B3] Process of assembling vehicle

- Consumption of each input energy in vehicle assembly
- GHG emission factor for producing each input energy in vehicle assembly
- GHG emission factor for burning each input energy in vehicle assembly

[B4] Process of transporting parts

a) Fuel method

- Consumption of fuel or electricity by means of each transport for each part
- GHG emission factor for producing fuel or generating electricity
- GHG emission factor for burning fuel

b) Fuel consumption method

- Transport distance by means of each transport for each part
- Fuel consumption or electricity consumption by means of each transport for each part
- GHG emission factor for producing fuel or generating electricity
- GHG emission factor for burning fuel

c) Improved ton-kilometer method (truck)

- Transport weight by means of each transport for each part
- Transport distance by means of each transport for each part

- Fuel consumption under improved ton-kilometer method
- GHG emission factor for producing fuel
- GHG emission factor for burning fuel
- d) Conventional ton-kilometer method (rail, ship, aircraft)
 - Volume transported by means of each transport for each part
 - CO₂ emission factor under conventional ton-kilometer method

[B5] Process of transporting finished vehicle

- a) Fuel method
 - Consumption of fuel or electricity by means of each transport for finished vehicle
 - GHG emission factor for producing fuel or generating electricity
 - GHG emission factor for burning fuel
- b) Fuel consumption method
 - Transport distance by means of each transport for finished vehicle
 - Fuel consumption or electricity consumption by means of each transport for finished vehicle
 - GHG emission factor for producing fuel or generating electricity
 - GHG emission factor for burning fuel
- c) Improved ton-kilometer method (truck)
 - Transport weight by means of each transport for finished vehicle
 - Transport distance by means of each transport for finished vehicle
 - Fuel consumption under improved ton-kilometer method
 - GHG emission factor for producing fuel
 - GHG emission factor for burning fuel
- d) Conventional ton-kilometer method (rail, ship, aircraft)
 - Volume transported by means of each transport for finished vehicle
 - CO₂ emission factor under conventional ton-kilometer method

[B6] Process of transporting, disposing of, and recycling waste materials generated during parts production

TBD

4.3.3 Primary data collection items

The following data shall be collected as primary data. However, if it is difficult to collect primary data from upstream suppliers, etc., secondary data may be collected. If primary data on transport cannot be obtained, the transport scenario in Section 4.3.5 may be used.

[B1] Process of transporting materials

- Vehicle weight

[B2] Process of producing parts

- Consumption of each input energy in parts production

[B3] Process of assembling vehicle

- Consumption of each input energy in vehicle assembly

[B4] Process of transporting parts

- a) Fuel method
 - Consumption of fuel or electricity by means of each transport for each part
- b) Fuel consumption method
 - Transport distance by means of each transport for each part

- Fuel consumption or electricity consumption by means of each transport for each part
- c) Improved ton-kilometer method (truck)
 - Transport weight by means of each transport for each part
 - Transport distance by means of each transport for each part
- d) Conventional ton-kilometer method (rail, ship, aircraft)
 - Volume transported by means of each transport for each part

[B5] Process of transporting finished vehicle

- a) Fuel method
 - Consumption of fuel or electricity by means of each transport for finished vehicle
- b) Fuel consumption method
 - Transport distance by means of each transport for finished vehicle
 - Fuel consumption or electricity consumption by means of each transport for finished vehicle
- c) Improved ton-kilometer method (truck)
 - Transport weight by means of each transport for finished vehicle
 - Transport distance by means of each transport for finished vehicle
- d) Conventional ton-kilometer method (rail, ship, aircraft)
 - Volume transported by means of each transport for finished vehicle

[B6] Process of transporting, disposing of, and recycling waste materials generated during parts production

TBD

4.3.4 Secondary data collection items

The following data shall be collected as secondary data. The default values in Appendix X may be adopted, or data collected independently by the party performing the calculation may be used. In this case, the validity of their own data is subject to verification.

[B1] Process of transporting materials

- GHG emission factor for transporting materials

[B2] Process of producing parts

- GHG emission factor for producing each input energy in parts production
- GHG emission factor for burning each input energy in parts production

[B3] Process of assembling vehicle

- GHG emission factor for producing each input energy in vehicle assembly
- GHG emission factor for burning each input energy in vehicle assembly

[B4] Process of transporting parts

- a) Fuel method
 - GHG emission factor for producing fuel or generating electricity
 - GHG emission factor for burning fuel
- b) Fuel consumption method
 - GHG emission factor for producing fuel or generating electricity
 - GHG emission factor for burning fuel
- c) Improved ton-kilometer method (truck)
 - Fuel consumption under improved ton-kilometer method
 - GHG emission factor for producing fuel
 - GHG emission factor for burning fuel

- d) Conventional ton-kilometer method (rail, ship, aircraft)
 - CO₂ emission factor under conventional ton-kilometer method

[B5] Process of transporting finished vehicle

- a) Fuel method
 - GHG emission factor for producing fuel or generating electricity
 - GHG emission factor for burning fuel
- b) Fuel consumption method
 - GHG emission factor for producing fuel or generating electricity
 - GHG emission factor for burning fuel
- c) Improved ton-kilometer method (truck)
 - Fuel consumption under improved ton-kilometer method
 - GHG emission factor for producing fuel
 - GHG emission factor for burning fuel
- d) Conventional ton-kilometer method (rail, ship, aircraft)
 - CO₂ emission factor under conventional ton-kilometer method

[B6] Process of transporting, disposing of, and recycling waste materials generated during parts production

TBD

4.3.5 Scenario

TBD

4.4 Use stage

4.4.1 Processes included in the scope of data collection

The following processes shall be covered:

- [C1] Process of producing fuel or generating electricity
- [C2] Process of driving
- [C3] Process of emitting fluorocarbons
- [C4] Process of producing maintenance parts
- [C5] Process of transporting maintenance parts
- [C6] Process of transporting, disposing of, and recycling waste materials generated during maintenance parts production

4.4.2 Data collection items

The following data shall be collected:

- [C1] Process of producing fuel or generating electricity
 - Certified fuel or electricity consumption
 - GHG emission factor for producing fuel or generating electricity
- [C2] Process of driving
 - Certified fuel or electricity consumption
 - GHG emission factor for burning fuel
- [C3] Process of emitting fluorocarbons
 - Fluorocarbon emissions

- GHG emission factor for emitting fluorocarbons

[C4] Process of producing maintenance parts

- Vehicle weight
- GHG emission factor for producing maintenance parts

[C5] Process of transporting maintenance parts

- Vehicle weight
- GHG emission factor for transporting maintenance parts

[C6] Process of transporting, disposing of, and recycling waste materials generated during maintenance parts production

TBD

4.4.3 Primary data collection items

The following data shall be collected as primary data:

[C1] Process of producing fuel or generating electricity

- Certified fuel or electricity consumption

[C2] Process of driving

- Certified fuel or electricity consumption

[C3] Process of emitting fluorocarbons

- Fluorocarbon emissions

[C4] Process of producing maintenance parts

- Vehicle weight

[C5] Process of transporting maintenance parts

- Vehicle weight

[C6] Process of transporting, disposing of, and recycling waste materials generated during maintenance parts production

TBD

4.4.4 Secondary data collection items

The following data shall be collected as secondary data. The default values in Appendix Figure X may be adopted, or data collected independently by the party performing the calculation may be used. In this case, the validity of their own data is subject to verification.

[C1] Process of producing fuel or generating electricity

- GHG emission factor for producing fuel or generating electricity

[C2] Process of driving

- GHG emission factor for burning fuel

[C3] Process of emitting fluorocarbons

- GHG emission factor for emitting fluorocarbons

[C4] Process of producing maintenance parts

- GHG emission factor for producing maintenance parts

[C5] Process of transporting maintenance parts

- GHG emission factor for transporting maintenance parts

[C6] Process of transporting, disposing of, and recycling waste materials generated during maintenance parts production

TBD

4.4.5 Scenario

TBD (The number of times that maintenance parts are exchanged, etc.)

4.4.6 Others

For maintenance parts, although the calculation method is defined assuming that GHG emissions for production and transport are proportional to vehicle weight, it is acceptable to calculate GHG emissions for each part using the method shown in Sections 4.2 and 4.3.

4.5 End-of-life stage

4.5.1 Processes included in the scope of data collection

The following processes shall be covered:

[D1] Process of transporting ELV

[D2] Process of dismantling ELV

[D3] Process of treating recovered parts after dismantling ELV

[D4] Process of transporting dismantled ELV

[D5] Process of shredding dismantled ELV

[D6] Process of recycling recovered materials after shredding dismantled ELV

[D7] Process of transporting ASR

[D8] Process of recycling ASR

[D9] Process of burying ASR

[D10] Process of disposing of residue of ASR

4.5.2 Data collection items

TBD

4.5.3 Primary data collection items

TBD

4.5.4 Secondary data collection items

TBD

4.5.5 Scenario

TBD

5 Methodology of CFP Declarations

5.1 Structure of CFP declarations

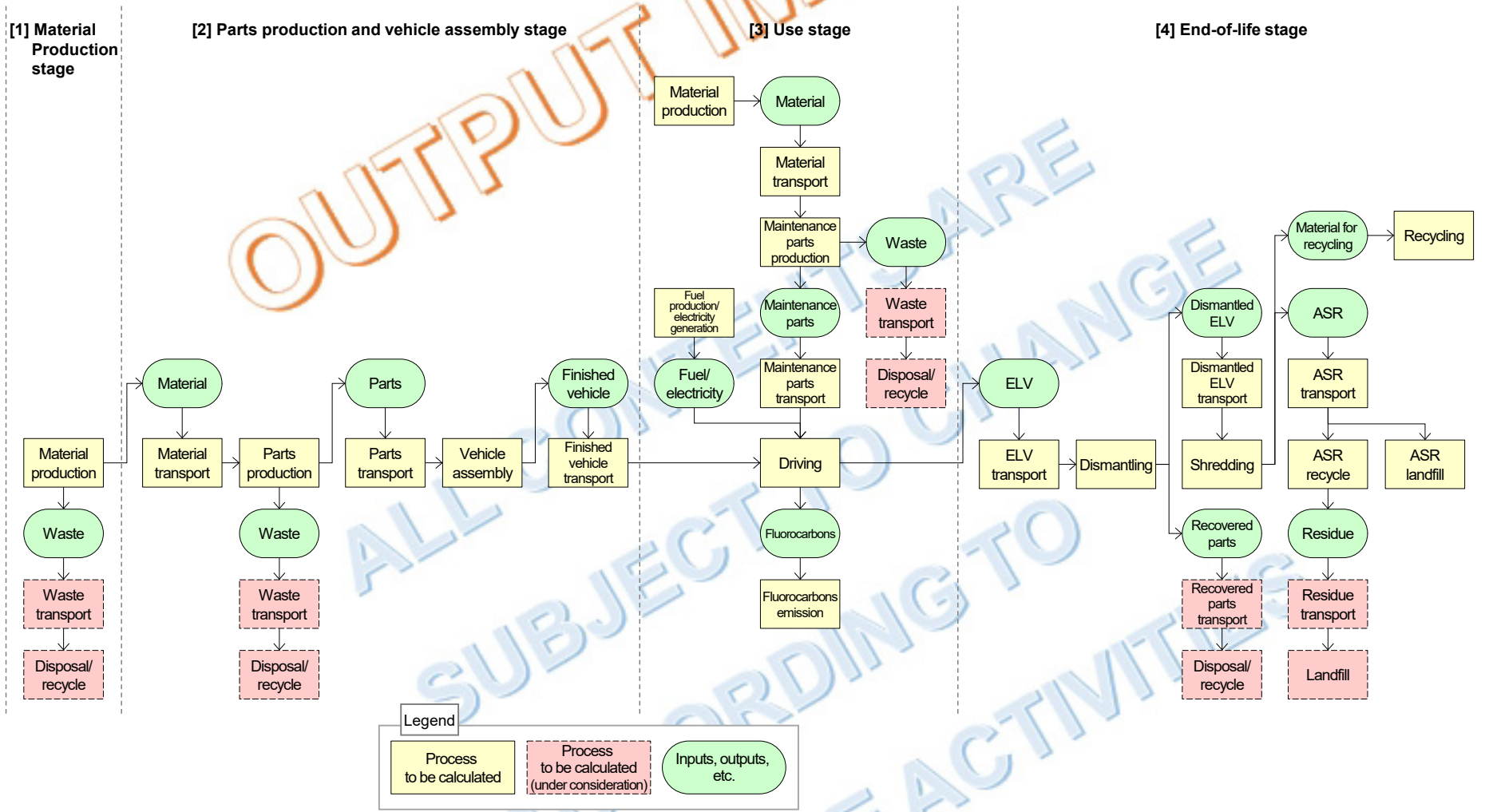
TBD

5.2 Detailed contents of CFP declarations

TBD

OUTPUT IMAGE

ALL CONTENTS ARE
SUBJECT TO CHANGE
ACCORDING TO
FUTURE ACTIVITIES



Appendix Figure 1 Life cycle flow

Appendix Table 1 Default values of GHG emission factor and yield rate for materials and specified parts

Name of material or part			GHG emission factor	Yield rate	
Material					
Steel	Steel sheet	Hot rolled carbon steel sheet	x.xx kgCO _{2e} /kg	xx.x%	
		Cold rolled carbon steel sheet	x.xx kgCO _{2e} /kg	xx.x%	
		Hot rolled hot-dip plated steel sheet	x.xx kgCO _{2e} /kg	xx.x%	
		Cold rolled hot-dip plated steel sheet	x.xx kgCO _{2e} /kg	xx.x%	
		Hot rolled electroplated steel sheet	x.xx kgCO _{2e} /kg	xx.x%	
		Cold rolled electroplated steel sheet	x.xx kgCO _{2e} /kg	xx.x%	
	Steel bar	Hot rolled carbon steel bar	x.xx kgCO _{2e} /kg	xx.x%	
		Cold rolled carbon steel bar	x.xx kgCO _{2e} /kg	xx.x%	
		Alloy steel	x.xx kgCO _{2e} /kg	xx.x%	
	Steel wire	Hot rolled carbon steel wire	x.xx kgCO _{2e} /kg	xx.x%	
		Cold rolled carbon steel wire	x.xx kgCO _{2e} /kg	xx.x%	
		Spring steel wire	x.xx kgCO _{2e} /kg	xx.x%	
	Steel pipe	Carbon steel pipe	x.xx kgCO _{2e} /kg	xx.x%	
		Plated carbon steel pipe	x.xx kgCO _{2e} /kg	xx.x%	
	Cast iron	Cast iron	x.xx kgCO _{2e} /kg	xx.x%	
		Cast steel	x.xx kgCO _{2e} /kg	xx.x%	
	Sintered steel	Sintered iron alloy	x.xx kgCO _{2e} /kg	xx.x%	
	Others	Scrap steel	x.xx kgCO _{2e} /kg	xx.x%	
	Aluminum alloy	Wrought alloy	Sheet (virgin)	x.xx kgCO _{2e} /kg	xx.x%
			Extrusion (virgin)	x.xx kgCO _{2e} /kg	xx.x%
Forging (virgin)			x.xx kgCO _{2e} /kg	xx.x%	
Sheet (recycled)			x.xx kgCO _{2e} /kg	xx.x%	
Extrusion (recycled)			x.xx kgCO _{2e} /kg	xx.x%	
Forging (recycled)			x.xx kgCO _{2e} /kg	xx.x%	
Sheet (mix)			x.xx kgCO _{2e} /kg	xx.x%	
Extrusion (mix)			x.xx kgCO _{2e} /kg	xx.x%	
Forging (mix)			x.xx kgCO _{2e} /kg	xx.x%	
Casting alloy		AC series (virgin)	x.xx kgCO _{2e} /kg	xx.x%	
		AD series (virgin)	x.xx kgCO _{2e} /kg	xx.x%	
		AC series (recycled)	x.xx kgCO _{2e} /kg	xx.x%	
		AD series (recycled)	x.xx kgCO _{2e} /kg	xx.x%	
		AC series (mix)	x.xx kgCO _{2e} /kg	xx.x%	
		AD series (mix)	x.xx kgCO _{2e} /kg	xx.x%	
		Copper / Copper alloy		x.xx kgCO _{2e} /kg	xx.x%
Other metal (Pt, etc.)		x.xx kgCO _{2e} /kg	xx.x%		
Plastic	Thermoplastic resin	Commodity plastic, low CO ₂ filler	x.xx kgCO _{2e} /kg	xx.x%	
		Commodity plastic, high CO ₂ filler	x.xx kgCO _{2e} /kg	xx.x%	

		Engineering plastic, low CO ₂ filler	x.xx kgCO ₂ e/kg	xx.x%
		Engineering plastic, high CO ₂ filler	x.xx kgCO ₂ e/kg	xx.x%
		Super engineering plastic, low CO ₂ filler	x.xx kgCO ₂ e/kg	xx.x%
		Super engineering plastic, high CO ₂ filler	x.xx kgCO ₂ e/kg	xx.x%
	Thermosetting resin	Urethane	x.xx kgCO ₂ e/kg	xx.x%
		Epoxy	x.xx kgCO ₂ e/kg	xx.x%
		Others	x.xx kgCO ₂ e/kg	xx.x%
Rubber / Process polymer			x.xx kgCO ₂ e/kg	xx.x%
Inorganic material / Glass			x.xx kgCO ₂ e/kg	xx.x%
Fluids			x.xx kgCO ₂ e/kg	xx.x%
Material for bodybuilding (for bus and truck)			x.xx kgCO ₂ e/kg	xx.x%
Part				
Tire			x.xx kgCO ₂ e/kg	—
Lead-acid battery			x.xx kgCO ₂ e/kg	—
Electronic parts			x.xx kgCO ₂ e/kg	—
Lithium-ion battery			x.xx kgCO ₂ e/kWh	—
CFRP			x.xx kgCO ₂ e/kg	—