

# Calculation method and conversion factors

▼CO<sub>2</sub> emissions ▼Waste ▼Others

## CO<sub>2</sub> emissions

### Sources of calorific value and emission factors used to calculate energy and Scope 1 & 2 CO<sub>2</sub> emissions:

- Please refer to Appendix 1 of the Ordinance on Enforcement of the Act on Rationalizing Energy Use and Appendix 1 of the Ordinance on Enforcement of the Act on Promotion of Global Warming Countermeasures for the calculation method, calorific value and emission factors.
- City gas uses calorific value for each business site. Electricity uses emission factors for each business site from Ministerial Ordinance on Calculation of Greenhouse Gas Emissions Arising from the Business Activities of Specified Emitters. – FY2018 Results, the Ministry of the Environment and Ministry of Economy, Trade and Industry.
- “Transportation etc.” of city gas refers to fuel etc. of CNG vehicles. Please refer to II-38 of “Part 2: Calculation method of greenhouse gas emission” of “Greenhouse Gas Emission Calculation and Reporting Manual (Ver4.6)” of the GHG Emissions Accounting, Reporting, and Disclosure System.
- Estimated energy usage volume is an estimation, due to reasons such as being a tenant in a building and not knowing the type of energy, etc. “Air conditioning energy estimation tool” of The Energy Conservation Center, Japan was used to calculate. Please refer to “Part 2: Calculation method of greenhouse gas emission” and II-35 of “CO<sub>2</sub> emissions when estimating the volume of energy usage as a tenant in buildings etc.” of “Greenhouse Gas Emission Calculation and Reporting Manual (Ver4.6) (June 2020)” of the GHG Emissions Accounting, Reporting, and Disclosure System.
- Used 3.6GJ/MWh as the calorific value of electricity from renewable energy sources.
- Used 0.277777778MWh/GJ as the electricity conversion factor.
- Scope includes consolidated Group companies in Japan, as well as Swan. Consolidated Group companies overseas were not included, since they account for less than 2% of Yamato Group’s operating revenue, and the estimated emission volume was minimal.
- Used FY2009 as the basis when setting targets for CO<sub>2</sub> emissions intensity.

### Source of calculation method and emission factors for Scope 3 CO<sub>2</sub> emissions, and reporting boundary:

### **(Category 1) Purchased goods and services**

- Boundary/scope of coverage: Goods and services purchased by Yamato Transport, outsourcing of deliveries (trunk-route transportation and deliveries), and outsourcing of repair and maintenance of vehicles and logistics facilities owned.
- Calculation method:  $\text{CO}_2 \text{ emission} = \text{Value of purchased good or service and outsourcing service} \times \text{emission factor of purchased good or service per unit of economic value}$  (source: “Basic Guideline for calculating greenhouse gas emissions throughout the supply chain (ver.2.3) ” by the Ministry of the Environment and the Ministry of Economy, Trade and Industry, and the spend-based method in the GHG protocol “Technical Guidance for Calculating Scope 3 Emissions-Supplement to the Corporate Value Chain (Scope3) Accounting & Reporting Standard”
- Emission factor: Source) “Emissions unit values for accounting of greenhouse gas emissions etc., by organizations throughout the supply chain” by the Ministry of the Environment (Ver.3.0)”, “[5]Emissions unit values based on the correspondence table by industry ①Emissions unit values: physical amounts ②Emissions unit values: monetary values.

(Reference: Yamato Transport accounts for 80% of total Scope 1 & 2 emissions of the Yamato Group consolidated companies in Japan, and Swan)

### **(Category 2) Capital goods**

- Boundary/scope of coverage: Capital goods (vehicles, buildings, parcel handling facilities etc.) purchased/acquired by Yamato Group consolidated companies
- Calculation method:  $\text{CO}_2 \text{ emissions} = \text{price of capital goods} \times \text{emission factor}$ . (Source: “Basic Guideline for calculating greenhouse gas emissions throughout the supply chain (ver.2.3) ” by the Ministry of the Environment and the Ministry of Economy, Trade and Industry, and GHG protocol ” Technical Guidance for Calculating Scope 3 Emissions-Supplement to the Corporate Value Chain (Scope3) Accounting & Reporting Standard” spend-based method)
- Emission factor: Source) “Emissions unit values for accounting of greenhouse gas emissions etc., by organizations throughout the supply chain (Ver.3.0)” by the Ministry of the Environment “[6] Emission unit values by price of capital good < Secretariat > ”

### **(Category 3) Fuel and energy-related activities not included in Scope1 or Scope2)**

- Boundary/scope of boundary: Upstream emissions of fuel and electricity purchased and used or sold by Yamato Group consolidated companies in Japan, and Swan
- Calculation method:  $\text{CO}_2 \text{ emissions} = \text{purchased volume of electricity and/or fuel} \times \text{emission factor}$ . (Source: “Basic Guideline for calculating greenhouse gas emissions throughout the

supply chain (ver.2.3)” by the Ministry of the Environment and the Ministry of Economy, Trade and Industry

- Emission factor: For electricity, used “Emissions unit values for accounting of greenhouse gas emissions etc., by organizations throughout the supply chain (Ver.3.0)” by the Ministry of the Environment “[7] Emission unit values per usage of electricity and heat < Secretariat >”. For fuel, used “IDEAv2 (for calculating emission volume of supply chain GHG” by the Ministry of the Environment.

#### **(Category 5) Waste generated in Operations**

- Boundary/scope of coverage: Waste generated in Yamato Transport
- Calculation method: CO<sub>2</sub> emissions = volume of waste treatment and recycling by waste type outsourced x emission factor. (Source: “Basic Guideline for calculating greenhouse gas emissions throughout the supply chain (ver.2.3)” by the Ministry of the Environment and the Ministry of Economy, Trade and Industry
- Emission factor: Source) “Emissions unit values for accounting of greenhouse gas emissions etc., by organizations throughout the supply chain (Ver.3.0)” by the Ministry of the Environment “[9] Emission unit value by waste type < Secretariat >”

(Reference: Yamato Transport accounts for 80% of total Scope 1 & 2 emissions of the Yamato Group consolidated companies in Japan, and Swan)

#### **(Category 6) Business travel**

- Boundary/scope of coverage: Business travel by employees of Yamato Holdings and Yamato Transport
- Calculation method: CO<sub>2</sub> emissions = total business travel expenditure by mode of business travel transport x emission factor. (Source: “Basic Guideline for calculating greenhouse gas emissions throughout the supply chain (ver.2.3)” by the Ministry of the Environment and the Ministry of Economy, Trade and Industry, and GHG protocol” Technical Guidance for Calculating Scope 3 Emissions-Supplement to the Corporate Value Chain (Scope3) Accounting & Reporting Standard” spend-based method)
- Emission factor: Source) “Emissions unit values for accounting of greenhouse gas emissions etc., by organizations throughout the supply chain (Ver.3.0)” by the Ministry of the Environment “[11] Emission unit values by amount of expenditure for transportation fares < Secretariat >”

#### **(Category 7) Employee commuting**

- Boundary/scope of coverage: Commuting by employees of Yamato Holdings and Yamato Transport
- Calculation method: CO<sub>2</sub> emissions = total travel expenses paid by method of travel x emission factor. (Source: “Basic Guideline for calculating greenhouse gas emissions throughout the supply chain (ver.2.3)” by the Ministry of the Environment and the Ministry of Economy, Trade and Industry
- Emission factor: Source) “Emissions unit values for accounting of greenhouse gas emissions etc., by organizations throughout the supply chain (Ver.3.0)” by the Ministry of the Environment “[11] Emission unit value per travel expense paid < Secretariat >”

**(Category 11) Use of sold products**

- Boundary/scope of coverage: Fuel sold by Yamato Auto Works
- Calculation method: CO<sub>2</sub> emission=total sales volume of fuel (diesel oil) x emission factor. (Source:”CO<sub>2</sub>e emission=Σ (total quantity of fuel sold x fuel combustion emission factor)” of the GHG protocol ”Technical Guidance for Calculating Scope 3 Emissions-Supplement to the Corporate Value Chain (Scope3) Accounting & Reporting Standard”
- Emission factor: Used “GHG emission calculation and reporting manual (Ver4.6)” of the “GHG emissions accounting, reporting and disclosure system” based on the Act on Promotion of Global Warming Countermeasures.

**(Category 12) End-of-Life Treatment of Sold Products**

- Boundary/scope of coverage: Packaging material sold by Yamato Transport (Kuroneko document cases)
- Calculation method: CO<sub>2</sub> emission = Weight of materials sold (estimated weight of waste paper) x emission factor. (Source:” Emissions unit values for accounting of greenhouse gas emissions etc., by organizations throughout the supply chain” by the Ministry of the Environment and the Ministry of Economy, Trade and Industry (Ver.3.0)”)
- Emission factor: Source)” Emissions unit values for accounting of greenhouse gas emissions etc., by organizations throughout the supply chain” by the Ministry of the Environment “[9]Emission unit values by waste type < Secretariat >”

**(Category 4) Upstream transportation and distribution**

**(Category 8) Upstream leased assets**

**(Category 9) Downstream transportation and distribution**

**(Category 10) Processing of sold products**

**(Category 13) Downstream leased assets**

**(Category 14) Franchises**

### **(Category 15) Investments**

- Not applicable.
- Refer to “Basic Guideline for calculating greenhouse gas emissions throughout the supply chain (ver.2.3)” by the Ministry of the Environment and the Ministry of Economy, Trade and Industry of Japan
- Category 4: Emissions through our business for which services are outsourced to third parties (such as outsourced transportation by trucks, railway, ships and aircraft) is calculated in Scope 3 Category 1 “Purchased goods and services”, so is not included here. Refer to “Explanations by industry (logistics industry) for the Basic Guidelines on accounting for greenhouse gas emissions throughout the supply chain” by the Ministry of the Environment.
- Category 8: Emissions from the operation of leased assets used by our business is calculated in Scope 1 and 2, so is not included here.
- Category 9: Calculated in Scope 1 and 2, and in Scope 3 Category 1 “Purchased goods and services”, so is not included here.
- Category 10: Not applicable
- Category 13: Although there are lease vehicles and electronic appliances in some of our Group companies, the volume of emissions makes up only an extremely small part of the total, as well as being hard to calculate, so was not included in the calculation.
- Category 14: Within the Yamato Group, Box Charter has a franchise system, but emissions by Box Charter makes up only 0.002% of the Group’s total emissions, as well as it being hard to collect data, so was not included in the calculation.
- Category 15: Not mainly private financial institutions.

## **Waste**

### **Boundary and Scope of waste:**

- Boundary: Consolidated Group companies in Japan, and Swan. In some Group companies, data was not available from contractors, and was thus not obtained.
- Hazardous waste is categorized as “Specially Controlled Waste” based on Japan’s Waste Management Law.
- Non-hazardous waste is categorized as other waste (industrial waste, general waste other than Specially Controlled Waste and valuables).
- “Recycled” refers to the total volume of material recycle, chemical recycle, and the portion of reduced volume that was recycled. “Recovered” refers to volume that was thermal recycled. “Incinerated” refers to volume that was incinerated, out of “reduced volume”.

“Final disposal” refers to volume that was landfilled, as well as the portion of reduced volume that was landfilled instead of being recycled.

- Includes some estimations (e.g. used proportional distribution for volume generated as tenant in building).
- Refer to “Category 5” above for calculation method of CO<sub>2</sub> from “Waste generated in operation” of Scope 3

## **Others**

### **Boundary and scope of Water:**

- Boundary: For water withdrawal, consolidated Group companies in Japan, and Swan. For water discharge, 13 consolidated Group companies in Japan.
- Both withdrawal and discharge include estimates.
- Partially revised FY2018 data, due to the widening of scope of calculation etc.

### **Size of habitat areas protected or restored through biotopes, etc.**

- Size of animal and plant habitat area restored through biotopes, etc.

### **Environmental accounting reference guideline:**

- “Environmental Accounting Guideline 2005” by the Ministry of the Environment