

Bridgestone Group

Basis of actual calculation for progress of "CO₂ Reduction Goals" (as of June 2019)

1. Scope of Calculation

The scope of calculation covers the lifecycle* of Bridgestone Group's major products.

* raw material purchasing, manufacturing, logistics and after-use phases

2. Reference Standards for calculation

ISO14064-1 Part 1	Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals (March, 2006)
WBCSD/WRI	A Corporate Accounting and Reporting standard (revised edition, March 2004)
WBCSD/WRI	Corporate Value Chain (Scope3) Accounting and Reporting Standard (September 2011)
WBCSD/WRI	Product Lifecycle Accounting and Reporting Standard (September 2011)
Japan Rubber Manufacturers' Association	Tire Inventory Analysis Trial (1998)

3-1. Basis of calculation for CO₂ Emissions from Company Operations

CO₂ calculation for operations was based on most recently available measured data and referenced to standards listed in above item 2. Description of calculation methods for each phase follows below.

Some of CO₂ calculation data still include estimations. We seek to continue improving this area for further transparency and data accuracy.

(1) Raw material procurement phase

CO₂ emissions for 'Tire Business' are calculated by multiplying the amount of our group's consumed raw material by corresponding CO₂ emission factors.

In order to reflect CO₂ emissions fluctuations from base year (2005) at internal manufacturing sites into our tire business, the difference in CO₂ emissions generated compared to base year is multiplied by the amount of production directed towards our group. The obtained figure is subtracted from or added to the initially obtained CO₂ emission figures.

CO₂ emissions of other business operations are estimated based on purchased raw material, or raw material composition, or sales amount of major products.

(2) Manufacturing phase

Energy (fuel, electricity, heat /steam) consumed during product manufacturing at our group's production sites is multiplied by CO₂ emission factors for each energy type in order to accurately calculate CO₂ emissions amount from the manufacturing phase.

For internal manufacturing sites in our tire business, this calculation is limited to the manufacture of products for outside companies.

※CO₂ emission factors by production site/consumed energy are referenced from the standards mentioned in item 2 and/or the standards listed below.

- GHG Protocol, Emission Factors from Cross Sector Tools, March 2017, developed by WRI and WBCSD
- International Energy Agency (IEA) – CO₂ Emissions from Fuel Combustion (2018 Edition)
- Law Concerning the Promotion of Measures to Cope with Global Warming
- US EPA eGRID

(3) Logistics (distribution) phase

The logistics (distribution) phase includes both ground and marine transportation of tires.

CO₂ emissions from ground transportation are calculated from the amount of distribution in our group.

Calculation for CO₂ emissions from marine transportation in the tire business are based on the amount of distribution and transportation distance. CO₂ emissions in other business areas are estimated from the amount of distribution and sales.

(4) After-use phase

To obtain CO₂ emissions from the after-use phase, the amount of disposed products estimated from the amount of procured raw material is multiplied by CO₂ emission factors for each raw material.

3-2. Basis of calculation for tires and rolling resistance coefficient in the Customers' use phase

The calculation for customer's use phase is currently limited to passenger cars, trucks and buses. Model tires representing each region and tire category are selected, their rolling resistance coefficient and actual sales of the model tire category are used to calculate our group's tire rolling resistance coefficient.

4. Notices

Since the disclosure of “CO₂ reduction target” achievements through our CSR report 2011, third party reviews and comments are closely considered when updating CO₂ calculation methods for further accuracy. Actual base year (2005) figures have also been altered along with this updating process.

The major changes made in calculation methods after disclosure of target achievement in CSR report 2011 are given below.

Target		Details of change
Tire	Raw material procurement phase	For the production phase of tire internal manufacturing sites, CO ₂ emission calculation methods were altered to reflect the fluctuation in gentan-i of productions for our group.
	Manufacturing phase	CO ₂ emission factors were changed. Calculation methods were altered to reflect CO ₂ emissions from the manufacture of products for outside companies in tire internal manufacturing sites.

Calculation of actual results is based on preconditions deemed reasonable by our group at the time of disclosure (June, 2019). CO₂ calculation methods including measures to reduce emissions will be reviewed regularly by paying close attention to changing social conditions and our business environment.