

Castrol Carbon-Neutral Calculator: terms and conditions

EXECUTIVE SUMMARY

BP Target Neutral has committed to helping you lower your carbon footprint from your daily journeys.

We devised this methodology statement as part of Enterprise Resources Management's (ERM's) ongoing support with the development of BP Target Neutral's online carbon-offsetting calculators for the UK, US and Netherlands markets.

This paper sets out the overarching approach for all transport-related projects undertaken by BP Target Neutral, and presents the rationale behind the method adopted for calculating emissions arising from different passenger transport modes.

EMISSION FACTORS

Emission factors for the UK and Netherlands markets are derived from the 2016 UK Government Greenhouse Gas (GHG) Conversion Factors for Company Reporting.¹ This document, previously known as the 'Guidelines to Defra/DECC's GHG Greenhouse Gas Conversion Factors for Company Reporting', is updated on a yearly basis.

Emissions are determined from either fuel use, taking into account the vehicle and fuel types; or distance travelled, using the appropriate average emission factors for different travel modes. When calculating emissions, you need to consider direct emissions of CO₂, CH₄ and N₂O from the combustion of fuel accounted for; indirect emissions associated with the extraction and transport of primary fuels; and the refining, distribution, storage and retail of finished fuels, which is also known as the well-to-tank (WTT) emissions.

AIR TRAVEL

There are two key elements that form the basis of air-travel emissions calculations:

1. An uplift factor of 8% applied to the flight distance to account for sub-optimal routing and stacking at airports during periods of heavy congestion
2. A Radiative Forcing Index (RFI) of 1.9 is applied to the CO₂ emissions factor of any given flight type. This accounts for non-CO₂ climate-change effects of aviation, such as those associated with vapour trails or NO_x emissions.

These two factors have already been incorporated into the government GHG conversion factors. As mentioned in Section 1.2, WTT emissions have been included in the relevant emission factors.

Flight distances are calculated using the Great Circle Flight methodology to account for the curvature of the Earth.

Emission factors are applied according to the route length, such as domestic, international, short- or long-haul. Band distances are used to determine the flight type.³

Table three (below) outlines the band start point for each flight type, and the associated emission factor.

Table 3. Flight type band start points and emission factors

Flight type	Band start (km)	Grand Total GHG (kgCO ₂ e/pkm)
Domestic	0	0.30830
Short-haul international	401	0.18635
Long-haul international	3700	0.19805

Class information – economy, business- of first-class travel – is not taken into consideration. Instead, the average conversion factor is used for each flight type.

[BOX OUT]

Emissions for a person making four return trips from San Francisco to London Heathrow
 = 2 x (distance x long-haul international average emission factor x number of trips)
 = 2 x (8,807 km x 0.19805 kgCO₂e/pkm x 4)
 = 13,953.8kg CO₂e

[/BOX OUT]

TREE CALCULATIONS

‘By refilling a gearbox with Castrol Optigear CO₂-neutral gear oil each year, for the average lifetime of a turbine, it is the equivalent of planting 29 trees and allowing them to live for their average life (40 years).’

- CO₂ sequestered by a conifer forest = 14 tons / hectare / year (UK Forestry Commission)
- Average life of a gear oil in wind turbine = seven years
- Average volume of gear oil in a wind turbine gearbox = 405 litres
- CO₂ offset per litre of Castrol Optigear wind-turbine gear oils = 2.3kg
- CO₂ offset per gearbox of Castrol Optigear wind-turbine gear oils = 930kg
- CO₂ offset per gearbox of Castrol Optigear wind-turbine gear oils per year = 133kg (0.133 tons per year)
- This is equivalent to 0.0095 hectares of Conifer forest
- One hectare of conifer forest = 2,500 trees (UK Forestry Commission)
- 0.0095 hectares = 24 trees

¹ 2016 UK Government GHG Conversion Factors for Company Reporting. Available online at: <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2016>

² 2014 US EPA Emission Factors for Greenhouse Gas Inventories. Available online at: https://www.epa.gov/sites/production/files/2015-07/documents/emission-factors_2014.pdf

³ GHG Emissions Resulting from Aircraft Travel, Carbon Planet, 2009. Available online at: http://www.carbonplanet.com/downloads/Flight_Calculator_Information_v9.2.pdf