CASTROL CARBON OFFSETTING PORTAL & OFFLINE CASTROL CARBON OFFSETTING TOOL:

METHODOLOGY FOR CALCULATING TRANSPORT EMISSIONS
26th January 2022

1.0 EXECUTIVE SUMMARY

Castrol PATH360 Dealer Program is committed to helping individuals to tackle their personal carbon footprint from their daily journeys. Under this Program, *Castrol's Offset Carbon Emissions from Fuel* offer provides an opportunity for dealers to offset the carbon emissions from fuel from their own fleet or include a carbon offsetting offer in the sale or service of cars. Through this offer, customers can purchase a car with a confirmation that demonstrates that the fuel emissions associated with driving a set distance in the car will be offset by Castrol.

Offset Carbon Emissions from Fuel offer, comprising:
- Castrol Carbon Offsetting Portal (the Portal); and
- Castrol Carbon Offsetting Tool (the Tool)

The Portal is a web based digital tool for European based dealers to enter data for individual vehicles to calculate emissions and purchase offsets via bp Target Neutral (bpTN)[1]

The Tool is an offline excel based tool for European based dealers who wish to enter and upload bulk vehicle data to calculate emissions and associated costs for offsets. This is then saved as a CSV file and uploaded to the Portal to enable offset purchase via bp Target Neutral. The Tool is also available for dealers outside of Europe, who are unable to access the Portal, to enter bulk vehicle data to calculate emissions and determine costs for offsets. The tool is then saved as a CSV file and sent to their Castrol sales representative who purchases offsets on their behalf from bpTN.

This methodology statement sets out the overarching approach and presents the rationale behind the methodology adopted for calculating emissions arising from road vehicles and calculating offset costs in both the Portal and the Tool - the methodology for calculating emissions is identical in both.

Using the explained methodology, the Portal and the Tool calculate the offset cost by multiplying the total GHG emissions (measured in tonnes of Carbon dioxide equivalents or tCO_2e) by the latest bp Target Neutral carbon credit portfolio price (1 tCO_2e is equivalent to 1 carbon credit). A link to a payment option is provided to allow the user to complete the transaction.

1.1 CONVERSION FACTORS

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[1] bpTN is the entity within bp that will purchase and retire applicable carbon credits on behalf of the dealerships. https://www.bp.com/en_gb/target-neutral/home.html

Carbon emission conversion factors (conversion factors) for all markets are derived from the [2021 UK Government Greenhouse Gas (GHG) Conversion Factors for Company Reporting](#) (UK Government 2021). The [WBSCD/WRI](#) [GHG Protocol](#) recognises this source for use as default conversion factors where country specific values are not readily available.

This document, previously known as the 'Guidelines to Defra/DECC's GHG Greenhouse Gas Conversion Factors for Company Reporting', is updated on an annual basis. To have alignment across Castrol PATH360 tools and portals, all conversion factors are updated simultaneously for consistency in January each year, therefore there may be a short lag between conversion factor release dates and when the calculators are updated.

Emissions are determined from either (1) fuel use, taking into account the distance fuel type and fuel efficiency (e.g. mpg, l/100km, gCO_2e/km) of the vehicle, or (2) distance travelled using the appropriate average conversion factors for different vehicles, based on sizes.

When calculating emissions, the following emissions are accounted for in the DEFRA conversion factors:

- Direct 'tank-to-wheel' (TTW) emissions of CO_2e from the combustion of fuel accounted for,
- Indirect emissions associated with the extraction and transport of primary fuels as well as the refining, distribution, storage and retail of finished fuels (otherwise known as the 'well-to-tank' (WTT) emissions)

The applicable 'well-to-tank' (WTT) emissions, whether relating to fuels or different travel modes, are therefore applied from the specific 'WTT' tab in UK Government GHG Conversion Factors for Company Reporting 2021 document and added to the relevant TTW conversion factor. Combining the two conversion factors above creates a 'well to wheel' (WtW) conversion factor covering emissions from the full life cycle of the fuels. Table 1 below shows a small sample of conversion factors used in the online calculator and used within the example calculations which follow.

Table 1: Example conversion factors used for all markets (taken from UK Government, 2021)

Emissions Category	Description	TTW Emissions	WTT emissions	Total WTW emissions	
Fuel	Petrol average biofuel blend	2.19352	0.61328	2.8068	$kgCO_2e$/litre
Fuel	Liquid Petroleum Gas (LPG)	1.55709	0.18383	1.74092	$kgCO_2e$/litre
Car	Small petrol car, up to 1.4 litre engine	0.14946	0.04186	0.19132	$kgCO_2e$/km

1.2 EXAMPLE CALCULATIONS

Slight variances will be seen between the online tools and the manual calculations laid out below due to formatting results to a set number of decimal places at the point of display to the end user.

a. *Fuel efficiency*

After inputting annual distance travelled the user can enter the car's fuel efficiency value in either 'miles per gallon' (mpg), 'litres per 100 km' (l/100km) or the vehicle emissions value in gCO_2/km.

Where fuel efficiency is provided, emissions are calculated on the basis of fuel usage and the fuel-specific conversion factor, as in the examples below.

For example, emissions for 10,000 miles travelled in a petrol-fueled car with 'mpg' value of 36:

> = fuel usage in litres x emission factor
> = [(mileage/fuel efficiency) x conversion to litres] x emission factor
> = [(10,000 miles/36 mpg) x 4.5461] x 2.91199 $kgCO_2$e/litre
> = 3,544 $kgCO_2$e = 3.5 tCO_2e

b.   Vehicle Size

Alternatively, it is possible for a user users in all markets can select the fuel type followed by their vehicle size.

For example, if a driver travelled 10,000 miles and opted for a small petrol car, emissions generated would be as follows:

> = distance in km x conversion factor ($kgCO_2$e/km)
> = (distance in miles x conversion to km) x emission factor ($kgCO_2$e/km)
> = (10,000 miles x 1.6093 km/mile) x 0.19132 $kgCO_2$e/km
> = 3,079 $kgCO_2$e = 3.1 tCO_2e

Another example: emissions for 10,000 miles in an LPG-fuelled car with 'l/100km' value of 27:

> = fuel usage in litres x emission factor
> = [(fuel efficiency) x (distance in miles x conversion to km)] x emission factor
> = [(27/100) litres/km x (10,000 miles x 1.6093 km/mile] x 1.74092 $kgCO_2$e/litre
> = 7,565 $kgCO_2$e = 7.6 tCO_2e

In instances where the user enters the car emissions value in gCO_2/km, this is uplifted by 22.9% to account for CH_4 and N_2O emissions as well as indirect 'WTT' emissions.

For example, emissions for 10,000 miles travelled in a car emitting 275 gCO_2/km:

> = [(emissions value x uplift factor 1.229) x (distance in miles x conversion to km)]/ 1,000
> = [(275 gCO_2/km x 1.229) x (10,000 miles x 1.6093 km/mile)]/ 1,000
> = 5,439 $kgCO_2$e = 5.4 tCO_2e

c. Vehicle registration number

For the UK market the user has the option to enter the vehicle registration number into the Portal. The car type is automatically looked up in the DVLA database and the emissions are

calculated depending on the annual distance travelled entered by the user.