

Methodology for the calculation of emissions

Abbreviated description

This is the abbreviated description of the methodology used by Key Travel. The same methodology will be used to estimate emissions for all other flights not booked through Key Travel and for calculating the flight levy under the Travel Policy.

The carbon emissions of each flight are calculated using the conversion factors provided by DEFRA that include the indirect effects of non-CO₂ emissions, also known as radiative forcing. These are updated annually. The calculation is based on the distance between the airports, the category of flight and the cabin class booked.

More detailed description

Key Travel's methodology uses the conversion factors provided by [DEFRA](#) on the Business travel-air tab, in line with HEFCE suggestions, which are updated annually. Key Travel uses the kgCO₂e column with RF (radiative forcing). An extract from the latest table is provided below and with relevant column shown by the blue arrow. We use kg/CO₂e and divide this by 1000 to reach the value in tonnes for charging the flight levy at £30/tCO₂e for Key Travel flights and £35/tCO₂e.

Activity	Haul	Class	Unit	With RF				Without RF			
				kg CO ₂ e	kg CO ₂	kg CH ₄	kg N ₂ O	kg CO ₂ e	kg CO ₂	kg CH ₄	kg N ₂ O
Flights	Domestic, to/from UK	Average passenger	passenger.km	0.24587	0.24455	0.0001	0.00122	0.13003	0.12871	0.0001	0.00122
		Short-haul, to/from UK	Average passenger	passenger.km	0.15353	0.15276	0.00001	0.00076	0.08117	0.0804	0.00001
		Economy class	passenger.km	0.15102	0.15026	0.00001	0.00075	0.07984	0.07908	0.00001	0.00075
		Business class	passenger.km	0.22652	0.22539	0.00001	0.00112	0.11976	0.11863	0.00001	0.00112
	Long-haul, to/from UK	Average passenger	passenger.km	0.19309	0.19212	0.00001	0.00096	0.10208	0.10111	0.00001	0.00096
		Economy class	passenger.km	0.14787	0.14713	0.00001	0.00073	0.07818	0.07744	0.00001	0.00073
		Premium economy class	passenger.km	0.23659	0.23541	0.00001	0.00117	0.12508	0.1239	0.00001	0.00117
		Business class	passenger.km	0.42882	0.42668	0.00002	0.00212	0.22671	0.22457	0.00002	0.00212
	International, to/from non-UK	First class	passenger.km	0.59147	0.58852	0.00002	0.00293	0.3127	0.30975	0.00002	0.00293
		Average passenger	passenger.km	0.18362	0.1827	0.00001	0.00091	0.09708	0.09616	0.00001	0.00091
		Economy class	passenger.km	0.140625	0.13992	0.000005	0.0007	0.074345	0.07364	0.000005	0.0007
		Premium economy class	passenger.km	0.225	0.22388	0.00001	0.00111	0.11895	0.11783	0.00001	0.00111
		Business class	passenger.km	0.40781	0.40578	0.00001	0.00202	0.2156	0.21357	0.00001	0.00202
		First class	passenger.km	0.56251	0.5597	0.00002	0.00279	0.29739	0.29458	0.00002	0.00279



The calculation is based on:

- Distance between the airports in question
- Category of flight e.g., Domestic, Shorthaul, Longhaul, International
- Cabin class booked

Distance:

The distance is calculated using the latitude and longitude of the airports involved, and the application of the Haversine formula to calculate the great circle distances between the 2 points. Please note this is based on 'straight line' distances, and the formulas assume a spherical earth which gives distance errors of +/- 0.3%.

Category of flight:

Based on the distance to be flown flights are categorised in the following way:

- 'Domestic' departure and destination same company
- International – neither destination nor origin are GB
- Longhaul – over 3800km
- Otherwise Shorthaul

Cabin class booked:

The emissions from the class of travel are calculated by DEFRA as follows:

- Premium economy class: 1.6 x economy class emissions
- Business class: 2.9 x economy class emissions
- First class: 4 x economy class emissions