



Carbon Emissions Calculations

Introduction

Emissions from air travel are a significant contributor to the emissions value of overseas events, whilst both road and rail emissions are relevant to UK events emissions. The Eventia One Future initiative does not calculate specific carbon values for events activity, but for those members who wish to understand in greater detail how emissions calculations work, the following is a useful reference point. For carbon auditing work undertaken for Eventia members, the carbon value from travel is calculated according to the government guidelines. These guidelines are prepared by the Department for Environment and Rural Affairs (DEFRA).

Calculations Explained

The Carbon Consultancy (TCC) calculates carbon emissions from energy use using the prevailing UK government standards on carbon dioxide reporting for energy use from fuel or fuel consumption. For travel activity where simple averaging can be substantially improved upon TCC provides calculations of carbon emissions based upon both approved government data, its own commissioned research and research undertaken for the UK government. It provides data in three areas of travel, air, rail and car. Refined data is used for the purposes of policy planning and informing travel choice, whilst all company reporting will use existing government standards.

Air

TCC uses two methods of calculation for air travel, its simple and advanced calculators.

The simple method uses DEFRA reporting guidelines for long and short haul travel per passenger per kilometre travelled. This method makes no distinction between the class of travel, (economy class passengers in this model subsidise business/first class passengers) and nor does it reflect the value of differing load factors and aircraft types in any calculation. For this reason the TCC simple calculator employs a weighting to eliminate the economy class subsidy of passengers in higher classes and uses its advanced calculator to introduce other factors that directly affect per passenger emissions calculations.

On TCC's web platform – www.carbonresponsible.com TCC offer a quick calculator that divides the world into 16 distance zones and 8 pricing zones. This is for users who wish to undertake quick and approximate emissions calculations and was designed to improve upon the limited short, medium and long haul options commonly available to consumers in other websites. This calculation tool is available for Eventia members to download and use as a quick calculation resource.

The TCC advanced calculator uses data on aircraft type, airline load factors, class of travel and aircraft seating configurations to refine the DEFRA model. It is informed by government commissioned research on EU aviation emissions, which includes an overall weight of fuel to carbon emission ratio by plane type that is equivalent to that employed in the DEFRA fuel type carbon reporting guidelines. To validate this research TCC have used its own commissioned research from Manchester University to examine individual aircraft type emissions. The purpose of this is also to establish the additional factors that will aid further refinement of the calculation process in any future studies commissioned by TCC.

The advanced calculator uses reported airline load factors from a common date range, the configuration of aircraft in airline's fleets and the reported fleet composition itself. The aim of the advanced calculator is to apportion carbon emissions by flown seat with the maximum possible accuracy. TCC aims to use its research to advance both debate and action in the travel and events industry with regard to the reduction of carbon emissions.

The calculation of emissions is initially based upon Great Circle distances between over 4,500 international and domestic airports throughout the world. This base distance information is calculated against airline selection, aircraft type (specified, fleet based or by range usage), load factors, class of travel, return or single journey.

In an environment where individual flight reporting on load and fuel usage is not readily available, it is necessary to use global averaging based upon refinement through identifiable factors to achieve per passenger emissions. The calculations provided by TCC are thus best estimates based upon available parameters and may be used by clients to assess their emissions footprint and determine travel choice. For corporate reporting purposes, companies should retain a DEFRA value for all flights, to ensure that their emissions values correspond to prevailing government guidelines.

TCC work on the basis of emissions per flown passenger, not per flown seat. The flown seat analysis used by some calculators fails to fully apportion air travel carbon emissions. This is especially relevant where up to 30% of total flown seat capacity is unoccupied.

Car

The car calculations provided by TCC are based upon the tested models and usage data prepared for the UK Vehicle Excise Duty bands. Car calculations are provided as a total based upon actual distance entered or as a direct comparison with road or rail distances, depending upon the primary mode of travel selection. The car type used is a Ford Mondeo 1.8i Sci 16v.

Rail

Rail calculations are based upon official UK rail network data including distances between stations on any selected route. In the absence of any detailed engine, fuel usage and passenger occupancy studies, TCC use the DEFRA reporting standard for rail passenger kilometres to provide rail emissions. UK studies have been undertaken for actual engine emissions but not as a working study with passengers. This is important as rail, like air travel emissions depend upon a variety of factors including distances between stations, load, fuel type and engine type amongst other factors.

In each calculation of travel emissions TCC is committed to the continued refinement of data to aid the process of education, travel choice and emissions apportionment. Emissions calculations will continue to be upgraded in line with new research both commissioned by TCC and other reliable scientific studies.