



Energy Consumption in the UK (2013)

Chapter 2

Transport energy consumption in the UK between 1970 and 2012

Publication URN: 13D/156

Published: 25 July 2013

This factsheet provides a brief overview of the trends and some key drivers that have influenced energy consumption within the transport sector in the UK since 1970. Analysis is based on data from DECC's annual publication 'Energy consumption in the UK' (ECUK) published on Thursday 25 July 2013: <https://www.gov.uk/government/publications/energy-consumption-in-the-uk>.

This factsheet looks at the change in transport energy consumption by the following sections:

- **Overall** transport energy consumption in 2012;
- Transport sector energy consumption by **type of transport** between 1970 and 2012;
- Transport sector energy consumption by **sector** between 1990 and 2012; and
- **Factors affecting transport energy consumption** between 1990 and 2011 .

Alongside the ECUK series of datasets and factsheets, a [User Guide](#) is also available which provides the reader with an overview of the content of each chapter within ECUK and explains technical concepts and vocabulary. The User Guide is not intended to offer commentary and interpretation of the data.

We value feedback on the content of this factsheet and comments or related queries should be sent to energyefficiency.stats@decc.gsi.gov.uk.

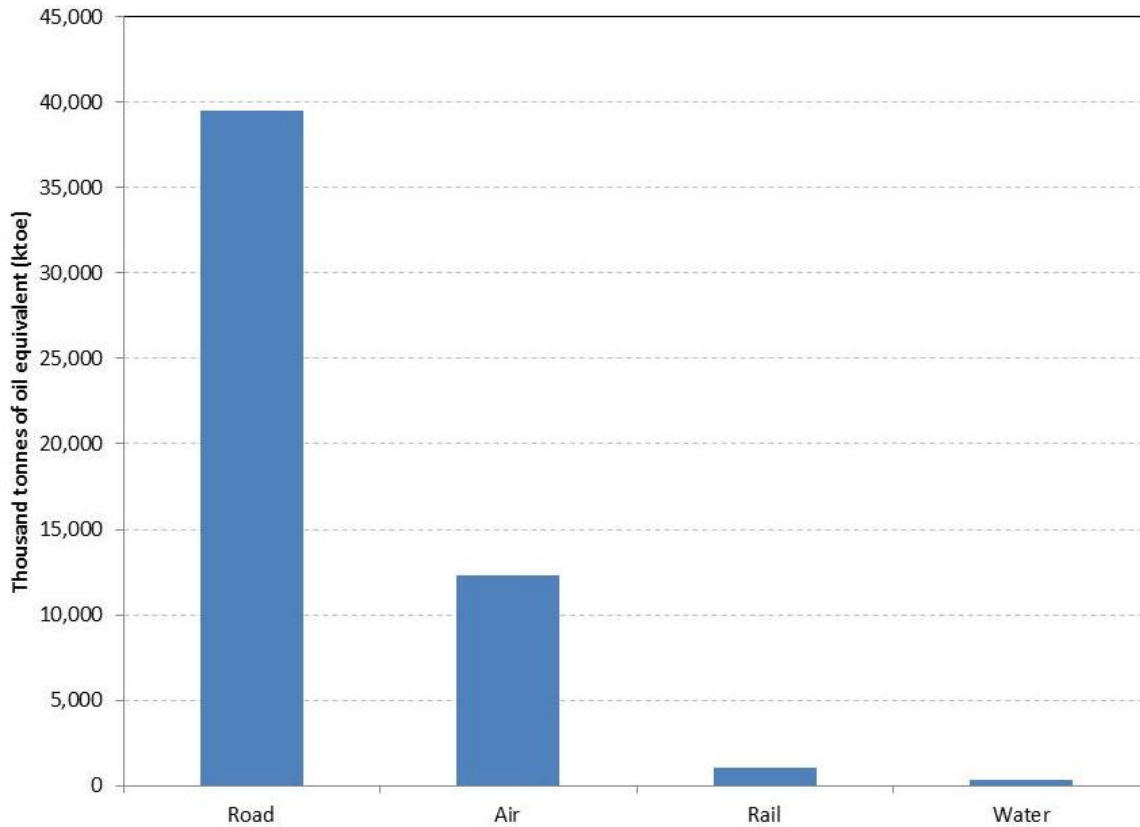
Overall transport energy consumption in 2012

Energy consumption in the transport sector in 2012 decreased by 1 per cent to 53,248 thousand tonnes of oil equivalent (ktoe), compared to 54,006 toe in 2011. Consumption from the transport sector represented 36 per cent of total final consumption of UK energy products in 2012.

Within the transport sector, road transport accounted for 74 per cent of final energy consumption and air transport 23 per cent (Chart 1). Total consumption in 2012 was 11 per cent lower than in 2007. However, much of this fall occurred between 2007 and 2009, and was caused mainly by the economic slowdown (Chart 2).



Chart 1 Transport energy consumption by type of transport, UK (2012)



Source: DECC, ECUK Table 2.01

In 2012, the:

- **Road** transport sector accounted for 74 per cent (39,468 ktoe) of total transport energy consumption in the UK, remaining fairly stable compared to 39,775 ktoe in 2011. Of the 39,468 ktoe consumed from road transport, it was estimated that 64 per cent (25,298 ktoe) was consumed from road passenger transport and 36 per cent (14,170 ktoe) from freight transport.
- **Air** transport sector accounted for 23 per cent (12,408 ktoe compared to 12,802 ktoe in 2011). This 3 per cent fall is largely due to improved efficiency;
- **Rail** transport sector 2 per cent (1,044 ktoe compared to 1,052 ktoe in 2011); and
- **Water** transport¹ sector 0.6 per cent (328 ktoe compared to 376 ktoe in 2011).

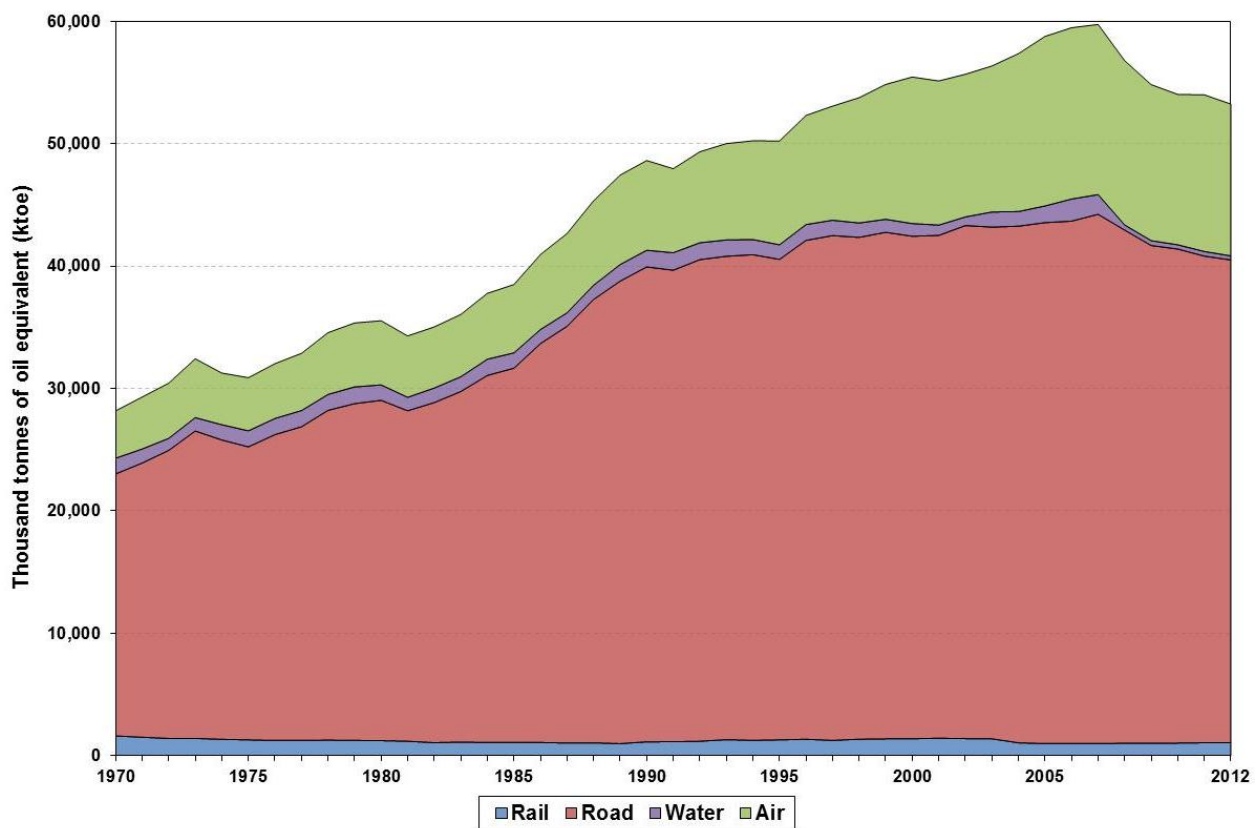
¹ Water transport includes inland waterways and national navigation. It does not include marine bunkers, which are deliveries to ocean-going and coastal vessels under international bunker contracts. Fuel consumption in International Bunkers has been revised for 2008 to 2012 using new estimates of marine fuel use. Further detail can be found in Chapter 3 of the Digest of the UK's Energy Statistics (paragraphs 3.62 and 3.63).



Transport sector energy consumption by type of transport between 1970 and 2012

Chart 2 below shows the increasing trend seen in energy consumption by the transport sector between 1970 and 2007, before the fall in consumption seen in recent years mainly attributed to the downturn in the economy, less car use for leisure purposes, and the increased efficiency in fuel consumption of new cars and improved air efficiency.

Chart 2 Transport energy consumption by type of transport, UK (1970 to 2012)



Source: DECC, ECUK Table 2.01

Between the period 1970 to 2012, energy consumption in the:

- **Road** transport sector increased by 84 per cent, from 21,409 ktoe to 39,468 ktoe. Much of the increase happened before 1990, as the rise since then has been 2 per cent;
- **Air** transport more than tripled from 3,869 ktoe to 12,408 ktoe; since 1990 the increase was 69 per cent;
- **Rail** transport sector fell 35 per cent from 1,611 ktoe to 1,044 ktoe; consumption in 2012 was 7 per cent lower than in 1990. The drop in consumption between 2003 and 2004

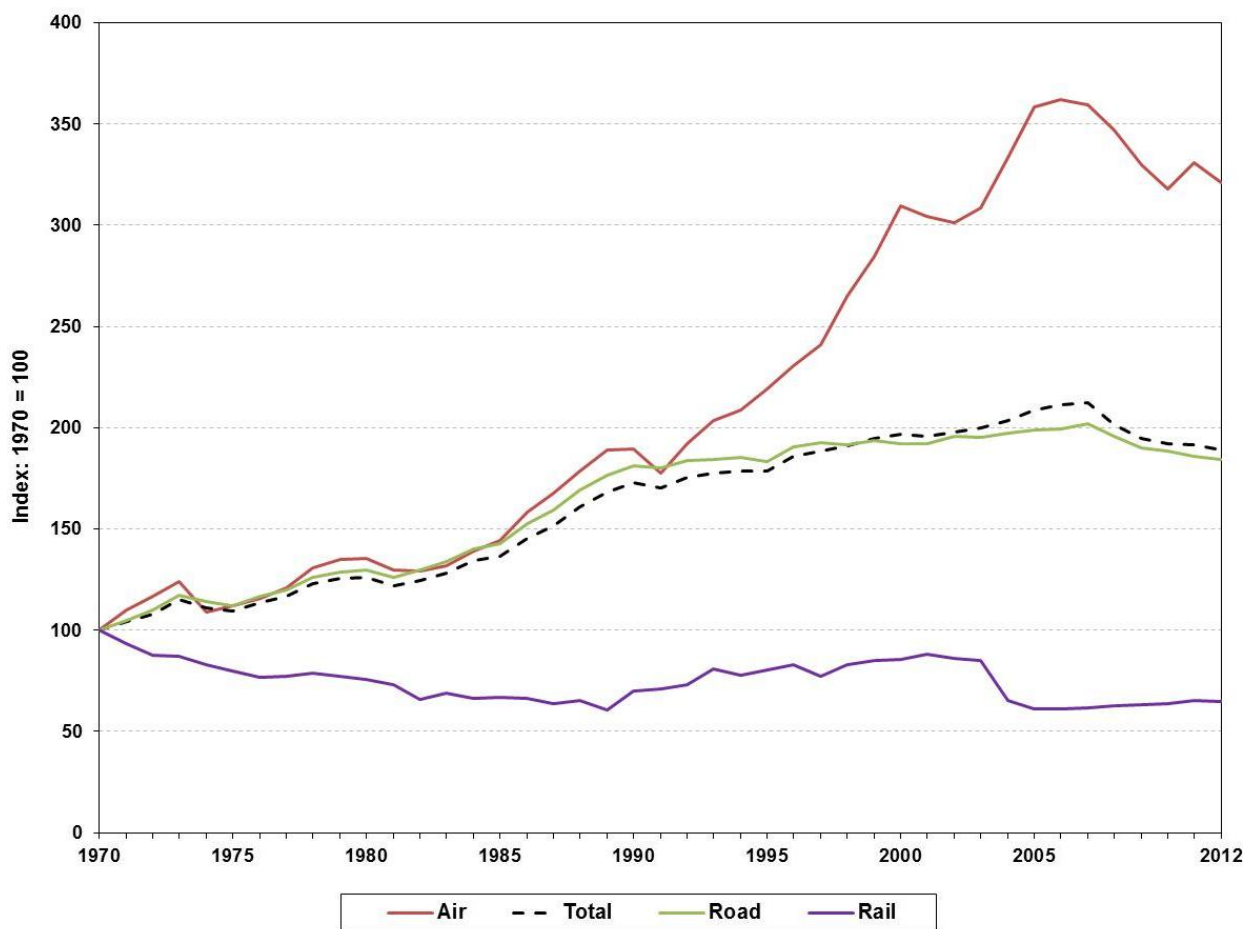


partially represents a change in methodology, where non-traction electricity consumption had been excluded. This has also impacted the longer term percentage changes; and

- **Water** transport sector decreased by 22 per cent since 2008. Due to changes in methodology², comparisons with data earlier than 2008 would not be robust. Therefore, any remaining analysis by sector contained in this factsheet excludes the water transport sector.

Chart 3 shows the change in transport energy consumption by type of transport indexed to 1970.

Chart 3 Transport energy consumption by type of transport, UK (1970 to 2012)



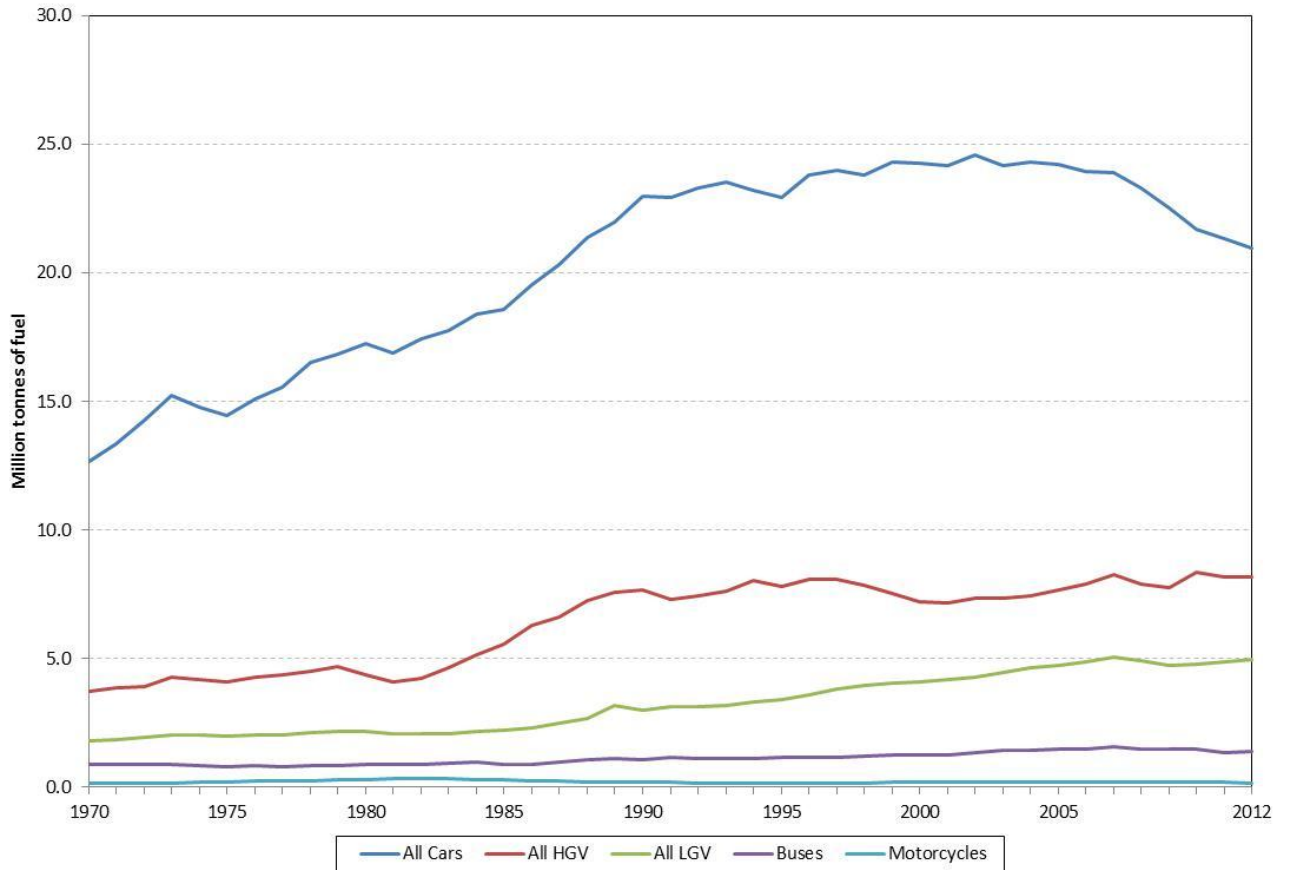
Source: DECC, ECUK Table 2.01

Chart 4 shows road transport energy consumption by different types of road vehicle between 1970 and 2012. Please note, chart 4 does not include LPG fuels which accounts for 0.093 million tonnes of fuel (mtoe) – that is, 0.3 per cent of all road transport consumption.

² Further detail can be found in Chapter 3 of the Digest of the UK’s Energy Statistics (paragraphs 3.62 and 3.63).



Chart 4 Road transport energy consumption by type of road vehicle, UK (1970 to 2012)



Source: DECC, ECUK Table 2.02

In 2012, cars accounted for three-fifths of road transport consumption followed by Heavy Good Vehicles (HGV) with 21 per cent and Light Goods Vehicles (LGV) with 14 per cent.

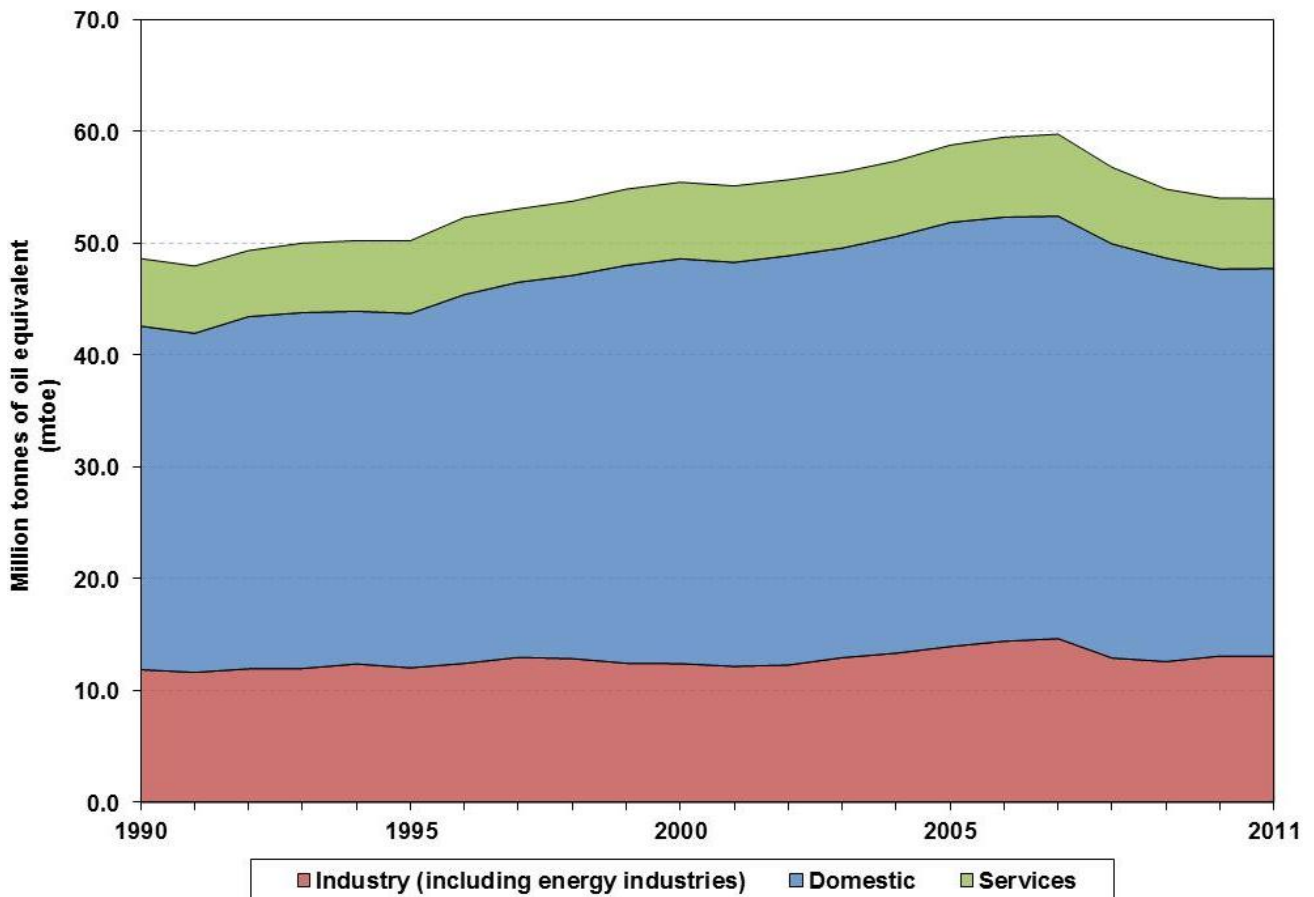
Transport sector energy consumption by sector between 1990 and 2011³

Transport energy consumption is used to support activity in the industrial, services and domestic sectors. Chart 5 below identifies the level of consumption for transport purposes of each of the three sectors between 1990 and 2011.

³ The most recent published data available by Department of Transport covers 2011 data. Data for 2012 will be published in the next edition of ECUK (July 2014).



Chart 5 Transport energy consumption reallocated to the Services, Domestic and Industrial sectors, UK (1990 to 2011)



Source: DECC, ECUK Table 2.03

Since 1990, the industry and domestic sectors have seen an increase in energy consumption for transport. Transport energy consumption for domestic purposes increased by 13 per cent to 34.7 mtoe in 2011 and consumption for industrial purposes by 10 per cent (to 13.1 mtoe). The services sector saw an increase of 4 per cent to 6.3 mtoe.

Between 2010 and 2011, the domestic sector was the only sector to show an increase in consumption (increase of 0.1 mtoe). The industrial and services sectors remained constant.

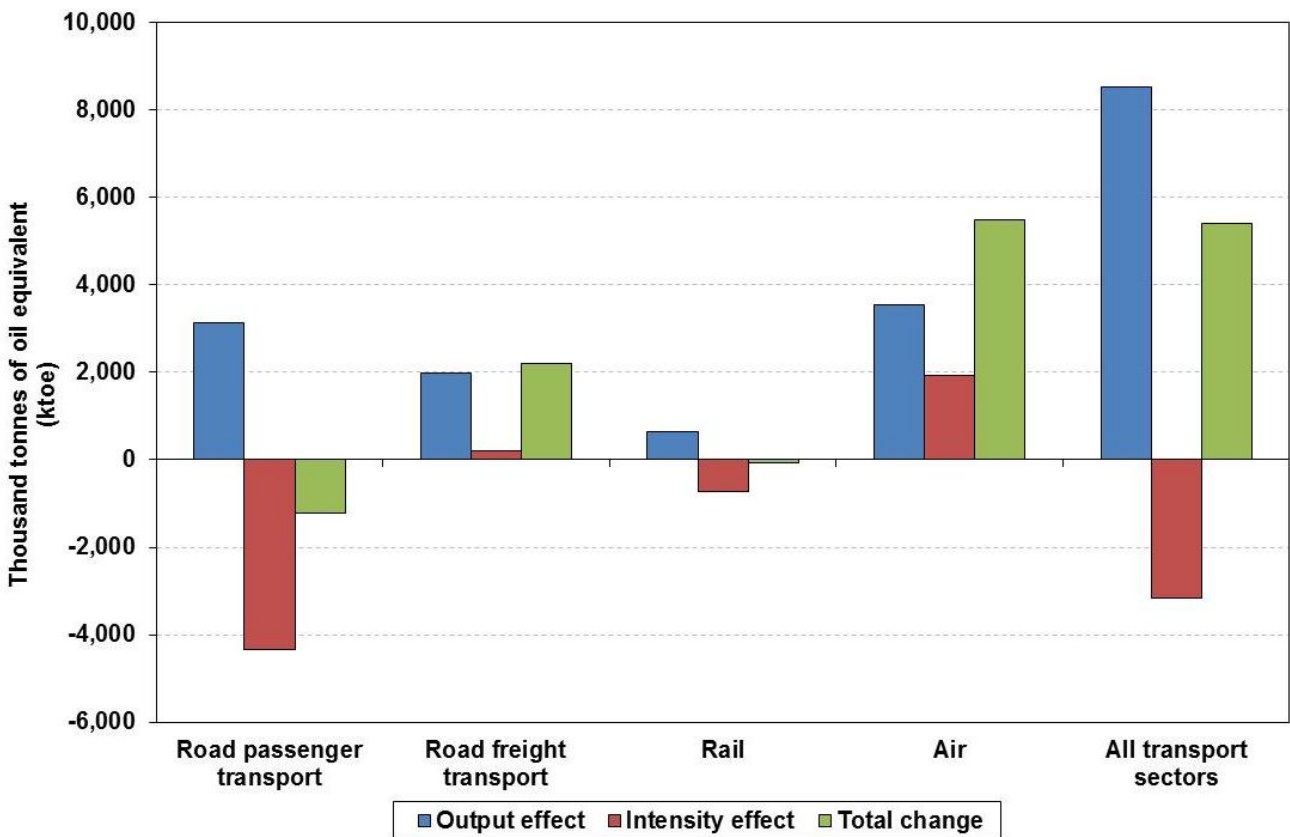
In 2011, it was estimated that 64 per cent of all transport energy demand was from the domestic sector, 24 per cent from the industrial sector and 12 per cent from the services sector. The ratio between the three sectors has varied very little since 1990.



Factors affecting transport energy consumption between 1990 and 2011

Energy consumption by the transport sector increased by 5.4 mtoe (11 per cent) between 1990 and 2011. Chart 6 shows how this rise in consumption can be attributed to a change in transport use (the output effect is a measurement of how much energy consumption has changed as a result of increased demand for transport) and changes in structure and efficiency/intensity (that is, energy consumed per passenger kilometre or freight tonne kilometre). The increase seen between 1990 and 2011 was largely driven by the air transport sector which showed an increase in consumption of 5.5 mtoe. There were also increases in consumption for road freight transport (2.2 mtoe); whilst the rail transport sector decreased by 0.1 mtoe, and road passenger transport fell by 1.2 mtoe. As mentioned above, there have been changes in the methodology for water transport sector since 2008 and therefore the water transport sector has been excluded from Chart 6.

Chart 6 Factors affecting change in transport energy use (between 1990 and 2011)



Source: DECC, ECUK Table 2.10



However, it has been estimated⁴ that if there had been no efficiency savings between 1990 and 2011, energy consumption in 2011 would have been 57.2 million tonnes of oil equivalent, 3.2 million tonnes of oil equivalent higher than the actual consumption. By looking at the relationship between energy consumption and distance travelled or load carried it is possible to measure energy intensity. For road passenger transport, energy intensity is measured in terms of consumption per passenger kilometre. To take into account of weight carried, road freight transport intensity is measured in relation to freight tonne-kilometres. Air transport energy intensity is measured as energy consumption per passenger kilometre.

The road passenger transport sector had the largest fall in intensity, whilst the air transport sector had the highest rise in intensity. The change in intensity is shown in Chart 7, which has been indexed to 1990.

Since 1970, road freight consumption per tonne-kilometres has increased by 20 per cent to 85.8 ktoe per billion tonne-kilometres lifted. This indicates that energy consumption increased at a higher rate than tonne-kilometres lifted. However, some of this increase may be a result of the economic slowdown seen in the last three years as the intensity increased by 5 per cent since 2007. This factor is also notable in prior recessions (Chart 6).

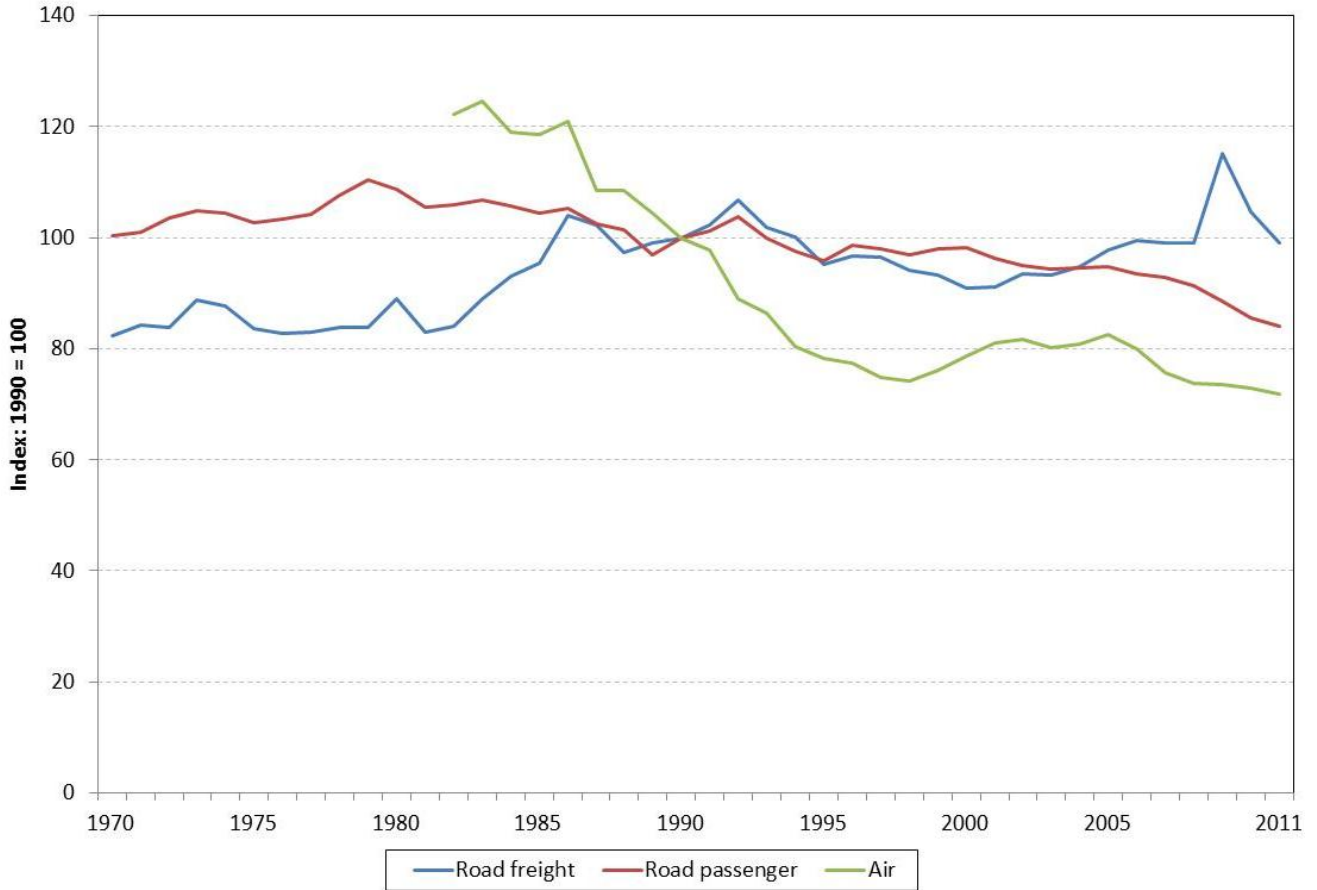
Between 1970 and 2011, road passenger energy consumption per passenger kilometres fell 16 per cent to 35.2 ktoe per billion passenger kilometres. This reduction comes mainly as a result of increased fuel efficiency of vehicles and consumers transferring from petrol cars to diesel cars.

Since 1982, air transport energy consumption per passenger kilometre has fallen 41 per cent to 41.9 ktoe per billion passenger kilometres. The majority of this improved energy intensity occurred during the 1980's and early 1990's, and reflects the trend of more frequent long-haul flights and improved technologies. This is reflected in a reduction in energy consumption of 8 per cent since 1995.

⁴ Further information about this estimation is available in Chapter 2 of the User Guide, which can be accessed here: <https://www.gov.uk/government/organisations/department-of-energy-climate-change/series/energy-consumption-in-the-uk>.



Chart 7 Energy intensities for road passenger, road freight and air transport (between 1970 and 2011)



Source: DECC, ECUK Table 2.11