

Energy Consumption in the UK (2013)

Chapter 1

Overall energy consumption in the UK since 1970

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

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

- **Overall** energy consumption in primary terms;
- **Overall** final energy consumption; and
- **Factors** affecting overall energy consumption between 1970 and 2011.

Total final consumption of UK energy products can be divided into four sectors – transport, domestic, industrial and services sector – where consumption from the transport sector represents 36 per cent of consumption in 2012, the domestic sector 29 per cent, the industrial sector 17 per cent and the services sector 13 per cent; the remaining 5 per cent was used for non-energy purposes. There are four additional factsheets that examine trends and drivers in each of these sectors in more detail.

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 energy consumption in primary terms

In 2012, total UK overall primary energy consumption in primary energy terms (that is, fuels obtained directly from natural sources) was 206.3 million tonnes of oil equivalent (mtoe), 2 per cent higher than in 2011, which – at 202.1 mtoe – had been the lowest level of UK primary energy



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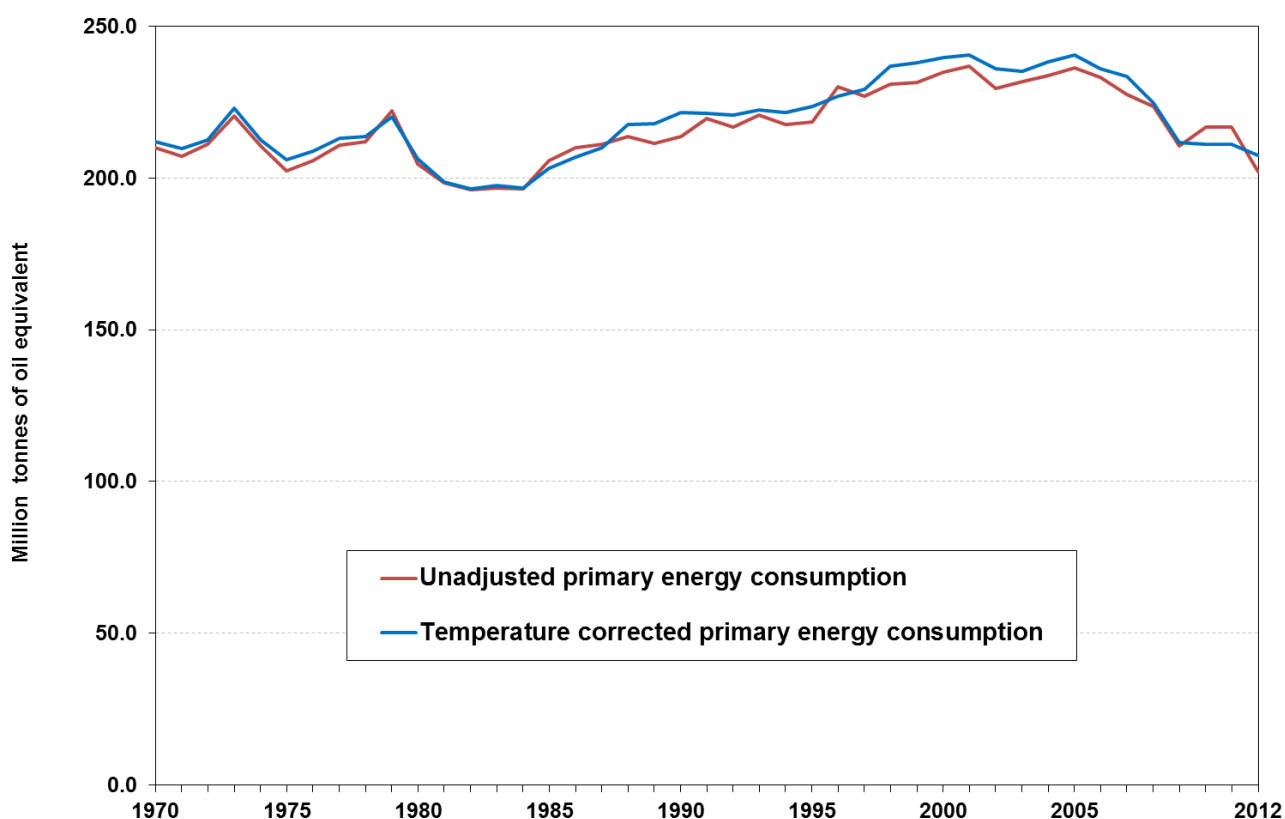


consumption for over 25 years. The level of primary energy consumption in 2012 was similar to that last seen in 1985, and was 3 per cent lower than in 1990 and 2 per cent lower than in 1970.

On a temperature corrected basis (to remove the impact a hot or cold year has on energy consumption) primary energy consumption in 2012 was at its lowest since 1985 at 206.1 mtoe; 2011 was a mild year, compared to 2010 and 2012. Between 1990 and 2012 primary energy consumption on a temperature correct basis fell by 7 per cent, and was 3 per cent lower than in 1970. There was a 1 per cent fall in consumption between 2011 and 2012.

Chart 1 shows how primary energy consumption has changed in the UK since 1970 for both the unadjusted and temperature corrected series.

Chart 1 **Total primary energy consumption, unadjusted and temperature corrected, UK (1970 to 2012)**



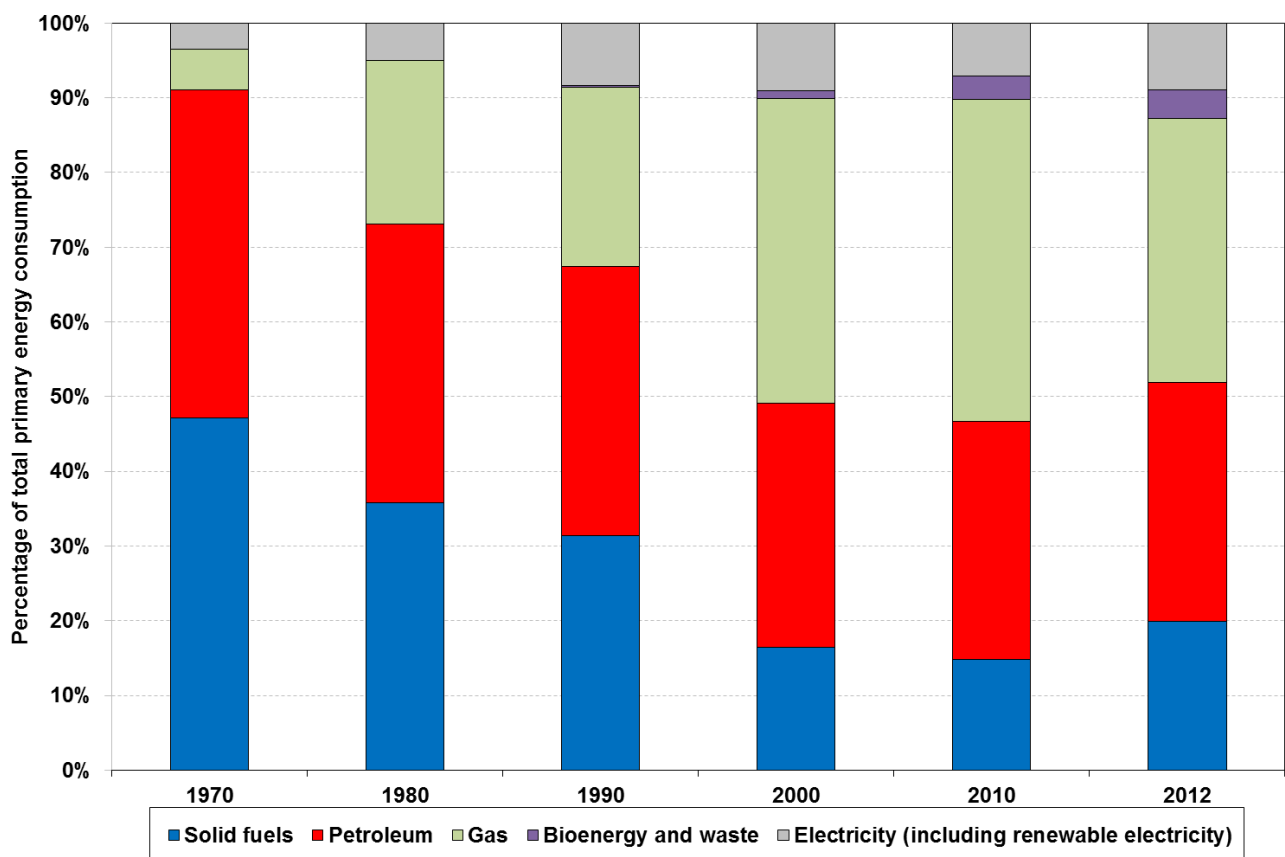
Source: DECC, ECUK Table 1.01

In 1970, fuel consumption was dominated by solid fuel use (47 per cent of all energy consumption in the UK) and petroleum (44 per cent), with gas contributing a further 5 per cent and electricity 4 per cent, as can be seen in Chart 2. By 1980 the fuel mix had evolved with the proportion of solid fuel consumption falling to 36 per cent, petroleum to 37 per cent and natural gas making up 22



per cent of all energy consumption in the UK. In 1990, the split between fuels was broadly similar to that in 1980, however by 2000 with changes in electricity generation, natural gas consumption had become the dominant fuel responsible for 41 per cent of all energy consumption in the UK, whilst solid fuels had fallen from 31 per cent in 1990 to 16 per cent in 2000. By 2012 more renewable fuels had entered the energy mix for both electricity generation and bioenergy consumption, and coal use for electricity generation had also increased. Around 11 per cent of electricity generated in 2012 came from renewable sources.

Chart 2 Total primary energy consumption by fuel, UK, 1970 to 2012



Source: DECC, ECUK Table 1.02

Overall final energy consumption

Final consumption of energy products in 2012 was 148.2 mtoe, of which 7.6 mtoe were used for non-energy purposes. The remaining 140.6 mtoe for energy purposes was 5 per cent lower than in 1990 and 4 per cent lower than in 1970.

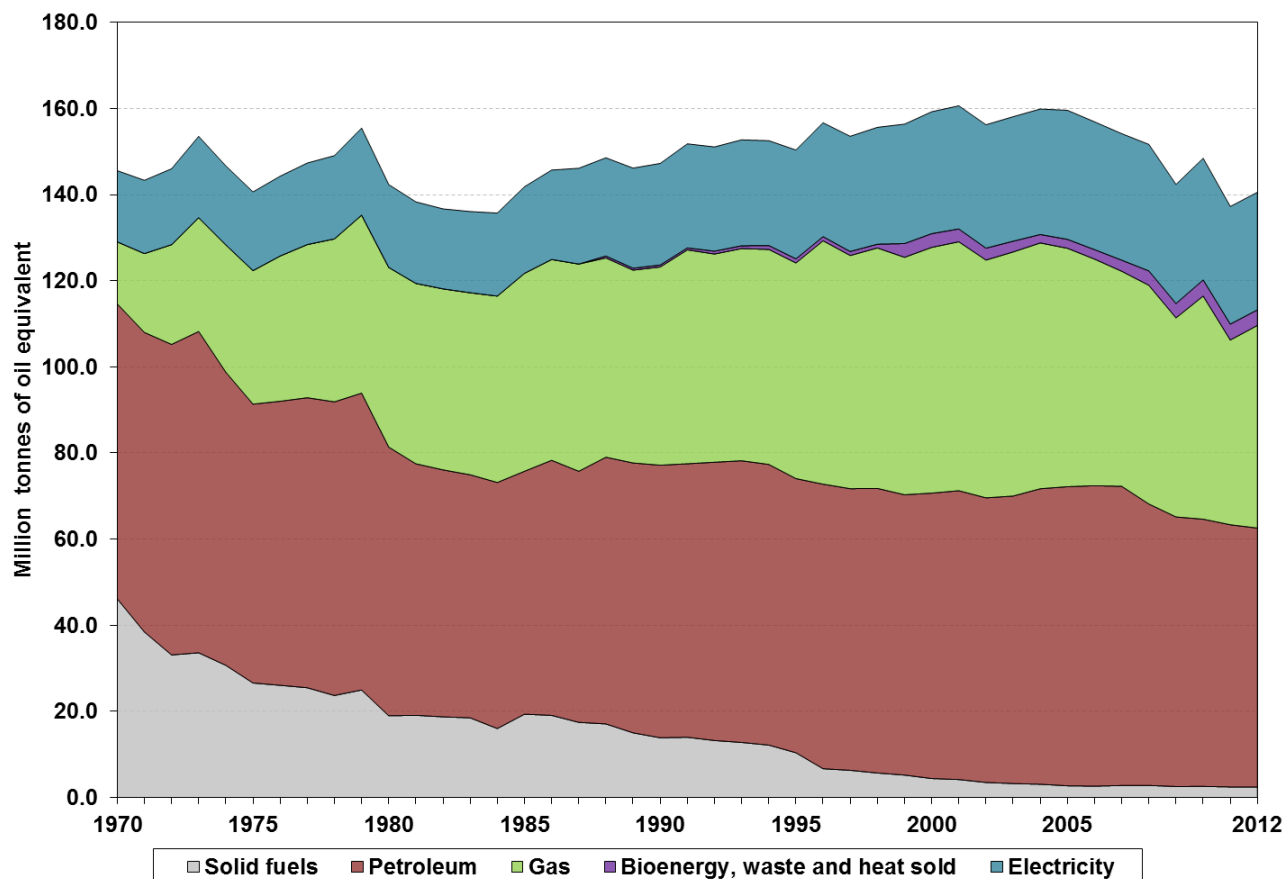
The most recent two years have shown the lowest level of final energy consumption in the UK since 1984. The decrease between 2010 and 2011 was mainly driven by the 17 per cent reduction



in gas consumption, resulting from a milder winter in 2011 requiring less fuel for heating purposes compared with the cold winter in 2010. This was reversed between 2011 and 2012, when more gas was used in the winter heating season as temperatures were cooler.

Chart 3 shows final energy consumption in the UK from 1970 to 2012 by fuel type.

Chart 3 Final energy consumption by fuel, UK (1970 to 2012)



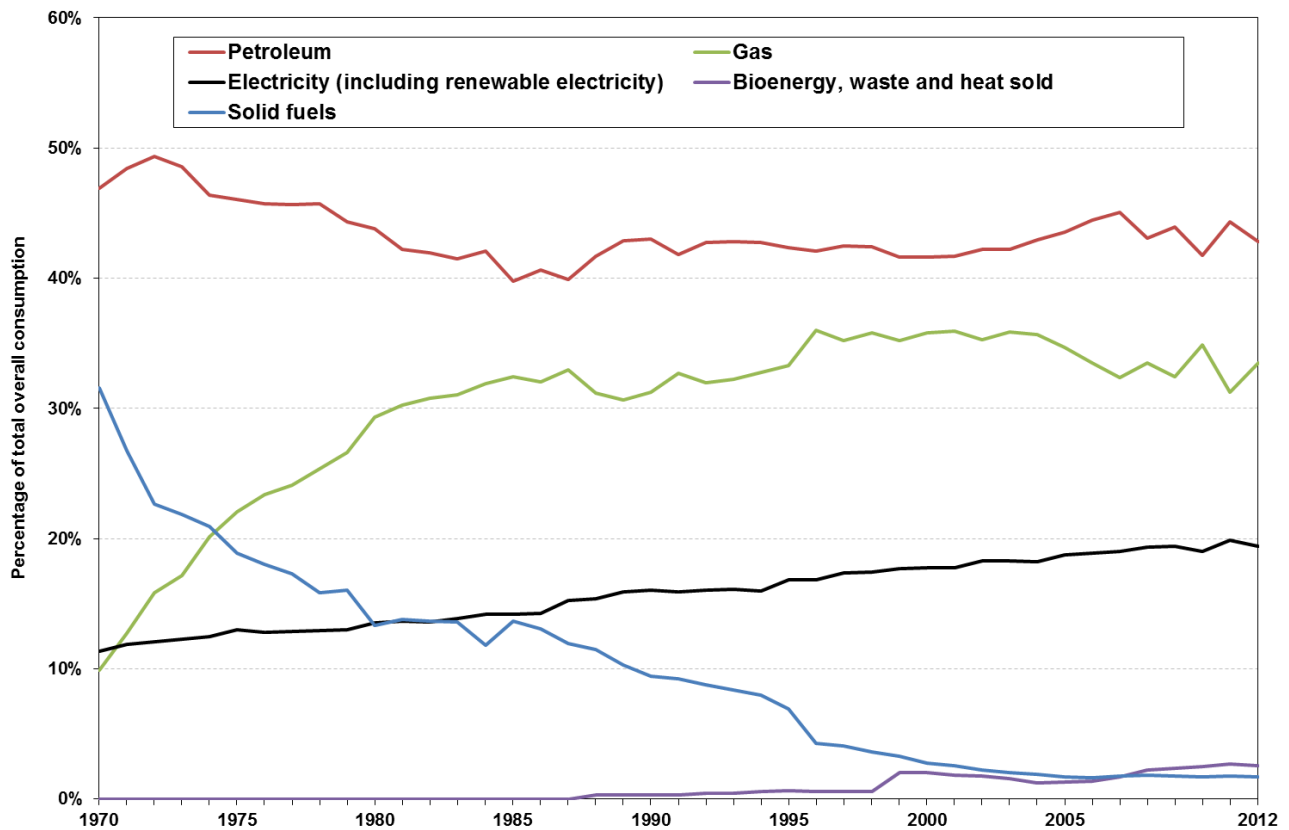
Source: DECC, ECUK Table 1.06

Since 1970, the overall fuel mix in the UK has significantly changed from solid fuels; accounting for 46.1 mtoe to only 2.4 mtoe in 2012, largely replaced by gas which grew from 14.4 mtoe in 1970 to 47.1 mtoe in 2012.

Over the same period electricity consumption increased by 65 per cent, to 27.3 mtoe. Since 1990 consumption of bioenergy and waste had increased from 0.5 mtoe to 2.4 mtoe. Chart 4 illustrates the changing fuel mix, illustrating that petroleum products remain the most used fuel and that despite the fall between 1970 and 1980, their use has remained broadly flat since then. The “dash for gas” in the 1970’s and early 1980’s is also identifiable, as is the steady increase in electricity use since 1970.



Chart 4 Final energy consumption by fuel, UK (1970 to 2012)



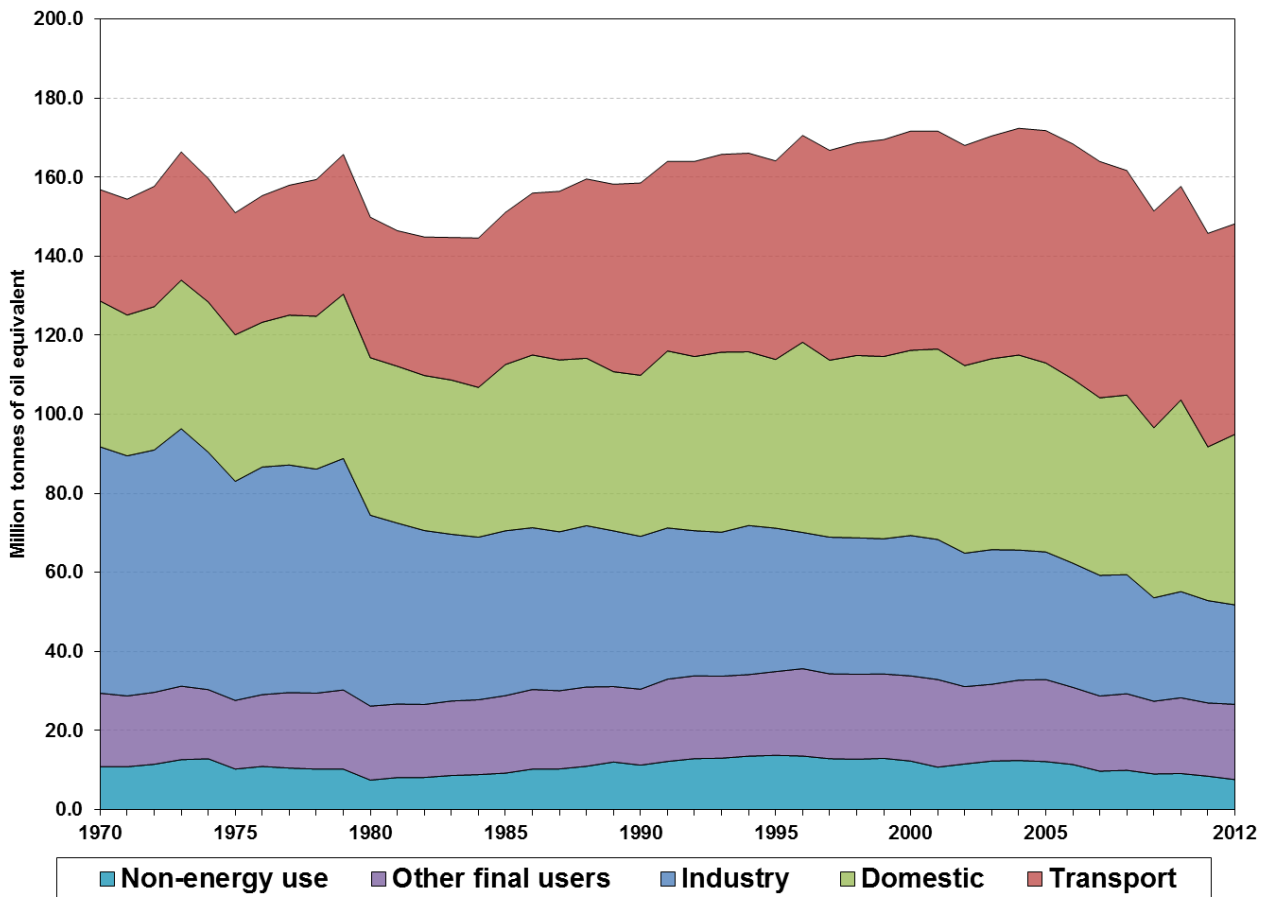
Source: DECC, ECUK Table 1.06

Chart 5 shows the changing levels of energy consumption by sector. In 1970, the industry sector was responsible for 40 per cent (62.3 mtoe) of total final UK consumption, followed by the domestic sector 24 per cent, transport 18 per cent and other final users 12 per cent (mainly agriculture, public administration and commerce), with 7 per cent being used for non-energy purposes.

However, by 1990 industrial consumption had fallen to 24 per cent of total final energy consumption in the UK, whilst transport consumption had risen to 31 per cent. Domestic use had increased slightly to 26 per cent whilst other final users and non-energy use remained at 12 per cent and 7 per cent respectively. The decreasing trend in industrial consumption continued and in 2012 was 17 per cent of total final energy consumption in the UK, with transport consumption responsible for 36 per cent and domestic 29 per cent.



Chart 5 Final energy consumption by sector, UK (1970 to 2012)



Source: DECC, ECUK Table 1.05

In 2011, 45 per cent of total final energy consumption was consumed for heating purposes (60.1 mtoe). Of this 54 per cent was consumed by the domestic sector, 19 per cent was consumed by the service sector and 27 per cent was consumed by the industrial sector. Provisional estimates for 2012 indicate that 64.1 mtoe were consumed for heating purposes, 47 per cent of total final energy consumption, with weather related factors being the driver for the change. The breakdown of total final energy consumption between the three sectors indicate that 57 per cent was attributed to the domestic sector, 19 per cent to the service sector and 24 per cent to the industrial sector.

Factors affecting overall energy consumption between 1990 and 2011

Overall energy consumption fell by 7 per cent (9.9 mtoe) between 1990 and 2011. Over this time energy consumption by the industry sector fell by one third (12.8 mtoe), the domestic sector by 5



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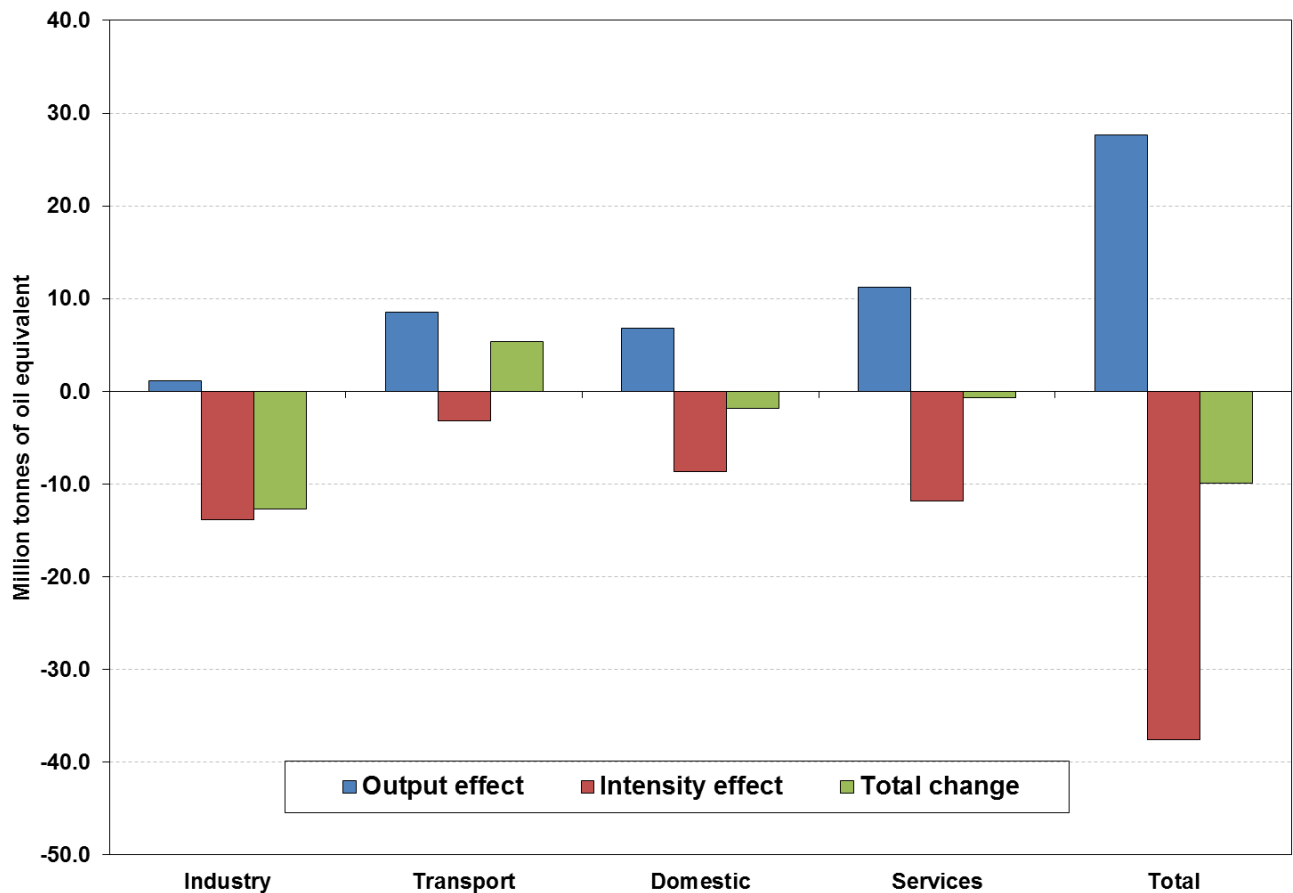


per cent (1.9 mtoe), and the services sector by 4 per cent (0.7 mtoe); in contrast the transport sector saw an increase of 11 per cent (5.4 mtoe).

Output from the economy, in terms of Gross Value Added, can be used to help measure changes in intensity in the industrial and services sectors, whilst the number of households can be used to help measure energy intensity in the domestic sector, and distance travelled for the road passenger transport sector and the distance travelled and weight carried can be used for the road freight transport sector.

Chart 6 uses these measures to estimate changes in energy intensity for each sector between 1990 and 2011¹, whilst Chart 7 shows the time series of intensity since 1970.

Chart 6 Factors affecting changes in final delivered by sector between 1990 and 2011



Source: DECC, ECUK Table 1.12

¹ Figures for 2012 are not available to calculate transport output and intensity. At time of publication, the latest published data by the Department for Transport were for 2011.



If the energy required to produce a unit of 'output' was the same in 2011 as in 1990, then it is estimated² that the energy consumption would have risen by an additional 27.7 mtoe, however this increase was offset by a fall in energy intensity of 37.6 mtoe, resulting in a net decrease in energy consumption of 9.9 mtoe.

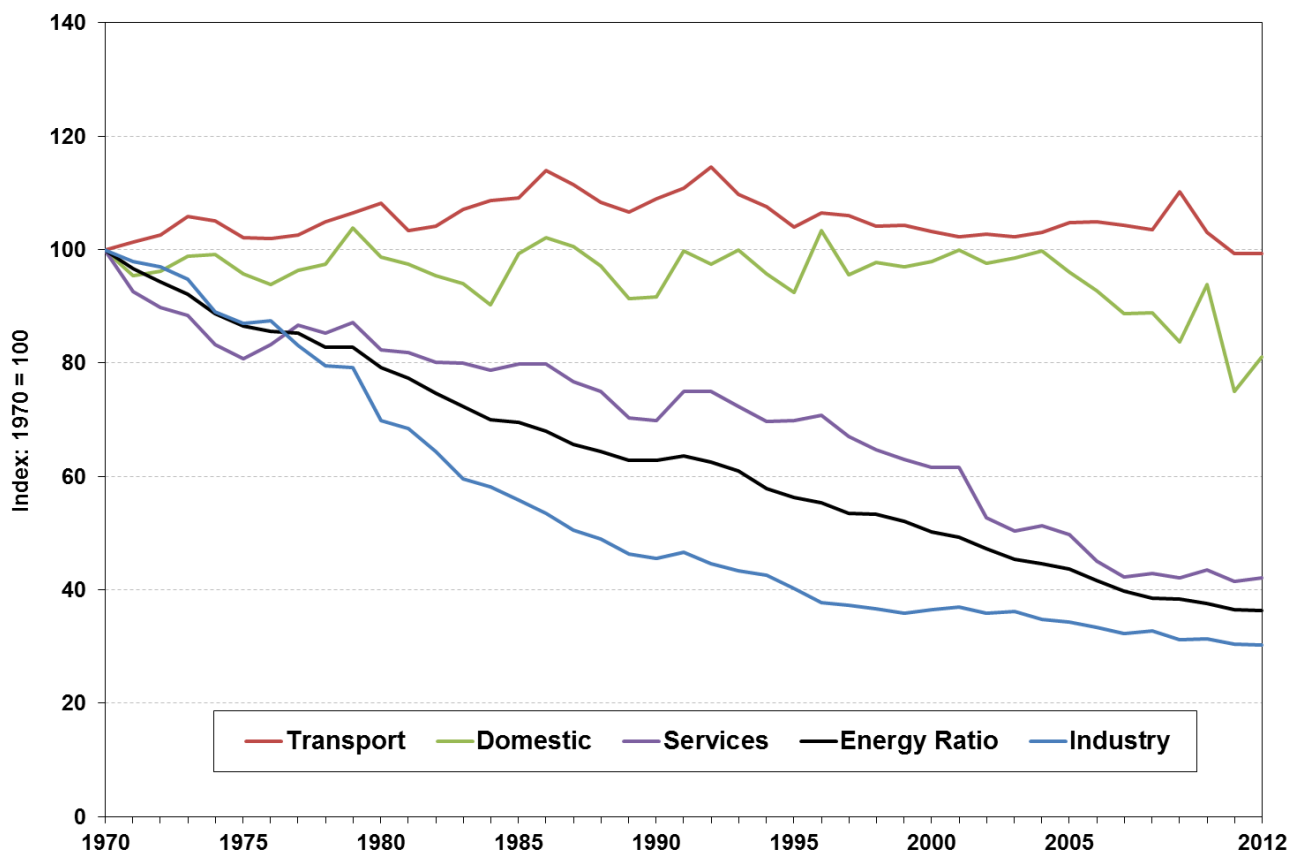
Chart 7 indicates that energy intensity in the industrial sector had fallen by 70 per cent between 1970 and 2012, a quicker rate than all other sectors (service sector down 58 per cent and the domestic sector down 19 per cent). However, since 1995 the rate of decline in the industrial sector has slowed, whilst the service sector has continued to decrease at an even rate, with the domestic sector being dominated by weather related factors and the impact of recent energy efficiency improvements to the housing stock.

The only sector to see no significant change between 1970 and 2012 was the transport sector which showed a fall of 1 per cent, with peaks in this series occurring at times of economic slowdowns. It should be noted that an improving long-term trend in energy intensity can be partially explained by improved energy efficiency or fuel switching.

² For further details of the estimation please see Chapter 4 (page 20) 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 intensity indicators by sector, UK (1970 to 2012)**



Source: DECC, ECUK Table 1.14

New tables included in Chapter 1 of the 2013 edition of ECUK

The following table is a new addition to this chapter of ECUK:

- Table 1.10 Temperature corrected final energy consumption by sector and fuel 2002 to 2012.