



Department  
of Energy &  
Climate Change

# Energy Consumption in the UK (2015)

Chapter 1: Overall energy consumption in the UK  
since 1970

30 July 2015

# Energy Consumption in the UK (2015)

Overall energy consumption in the UK since 1970

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# Contents

Background.....	4
Key terms used in this document .....	4
1. Overall energy consumption in primary terms between 1970 and 2014 .....	6
2. Overall final energy consumption between 1970 and 2014.....	8
3. Factors affecting overall energy consumption between 2000 and 2013 .....	11
Annex A Publication timetable for ECUK Chapter 1 tables in 2015 .....	13
Annex B Related DECC publications.....	15

## Background

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' (ECUK) published on Thursday 30 July 2015: <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 between 1970 and 2014.
- **Overall** final energy consumption between 1970 and 2014.
- **Factors** affecting overall energy consumption between 1970 and 2013.

This factsheet also contains publication plans for each table and a summary of related DECC publications in the Annex.

Total final consumption of UK energy products can be divided into four sectors – transport, domestic, industrial and services. Consumption from the transport sector represents 38 per cent of overall consumption in 2014, the domestic sector 27 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](mailto:EnergyEfficiency.stats@decc.gsi.gov.uk).

## Key terms used in this document

The following terms have been used frequently in this factsheet and the data tables and have been defined below in order to aid the unfamiliar user in fully understanding the statistics.

- **Primary energy equivalents** - this is the amount of the fuel used directly for consumption in a sector prior to any loss of energy via conversion or transformation process. Therefore, the primary energy equivalent estimates will include any losses incurred during the transformation process and energy used by the energy industry, and will differ from final energy consumption estimates.
- **Final energy consumption (end use)** – this refers to energy consumed by final end users after energy has been transformed, as opposed to primary energy consumption which is energy in its original state.
- **Non-energy use** – this category includes the consumption of energy products which have not been used directly to provide energy. This category includes use for chemical feedstock, solvents, lubricants and road making material.
- **Million tonnes of oil equivalent (Mtoe)** – this is a common unit of measurement which enables different fuels to be compared and aggregated. A tonne of oil equivalent (toe) is a unit of energy.

A full glossary of terms used within the energy industry has been provided in Annex B of the DECC statistics publication 'Digest of UK Energy Statistics' (DUKES)<sup>1</sup>.

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<sup>1</sup> DUKES can be accessed here: <https://www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes>.

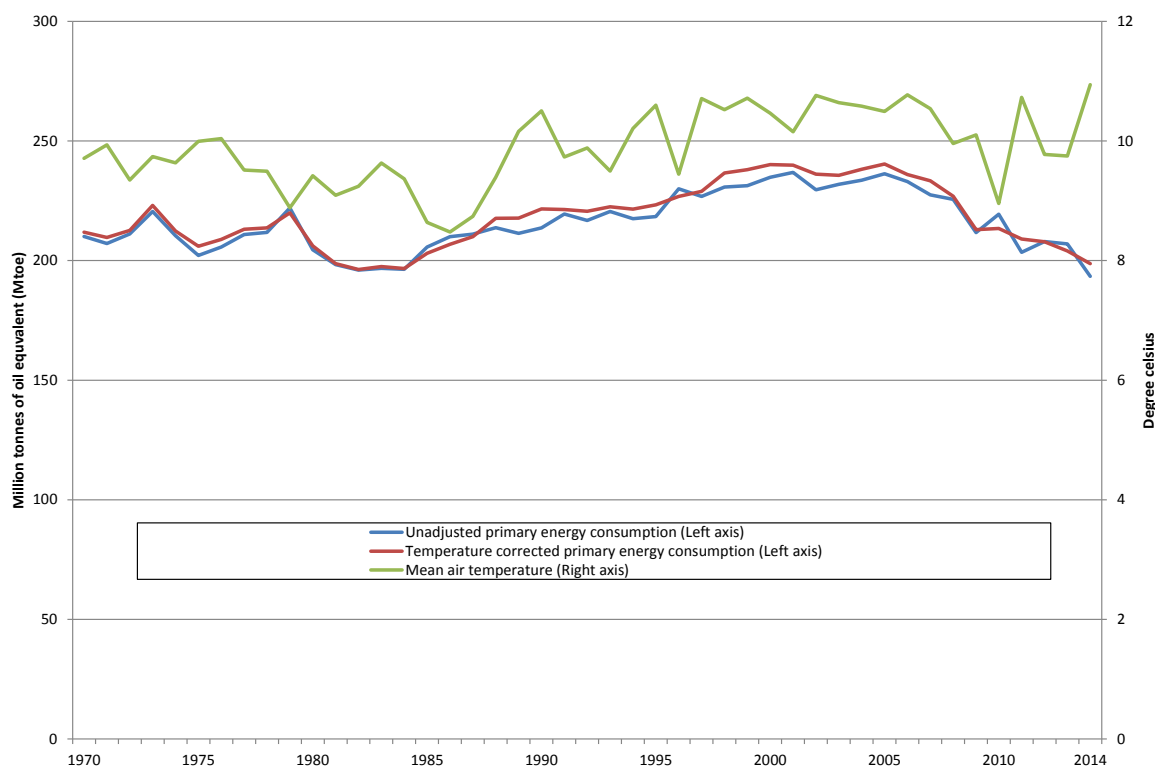
## 1. Overall energy consumption in primary terms between 1970 and 2014

In 2014, total UK overall primary energy consumption in primary energy terms (that is, fuels obtained directly from natural sources) was 193.4 million tonnes of oil equivalent (Mtoe), 6.6 per cent lower than in 2013, and 7.0 per cent lower than the 2012 level. This is the lowest since prior to 1970. The year on year decrease (6.6 per cent from 2013 to 2014) was the third highest also since 1970; consumption saw a 7.9 per cent decrease between 1979 and 1980, and a 7.3 per cent decrease from 2010 to 2011.

On a temperature corrected basis (to remove the impact a hot or cold year has on energy consumption) primary energy consumption in 2014 fell by 5.3 Mtoe (2.6 per cent), to 198.7 Mtoe, the lowest since 1984. Between 2000 and 2014 primary energy consumption on a temperature correct basis fell by 17 per cent; it was 10 per cent lower than in 1990, and was 6.2 per cent lower than in 1970. In 2014, mean air temperature was the warmest year since 1970, 10.9 degrees Celsius.

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, & mean air temperature UK (1970 to 2014)



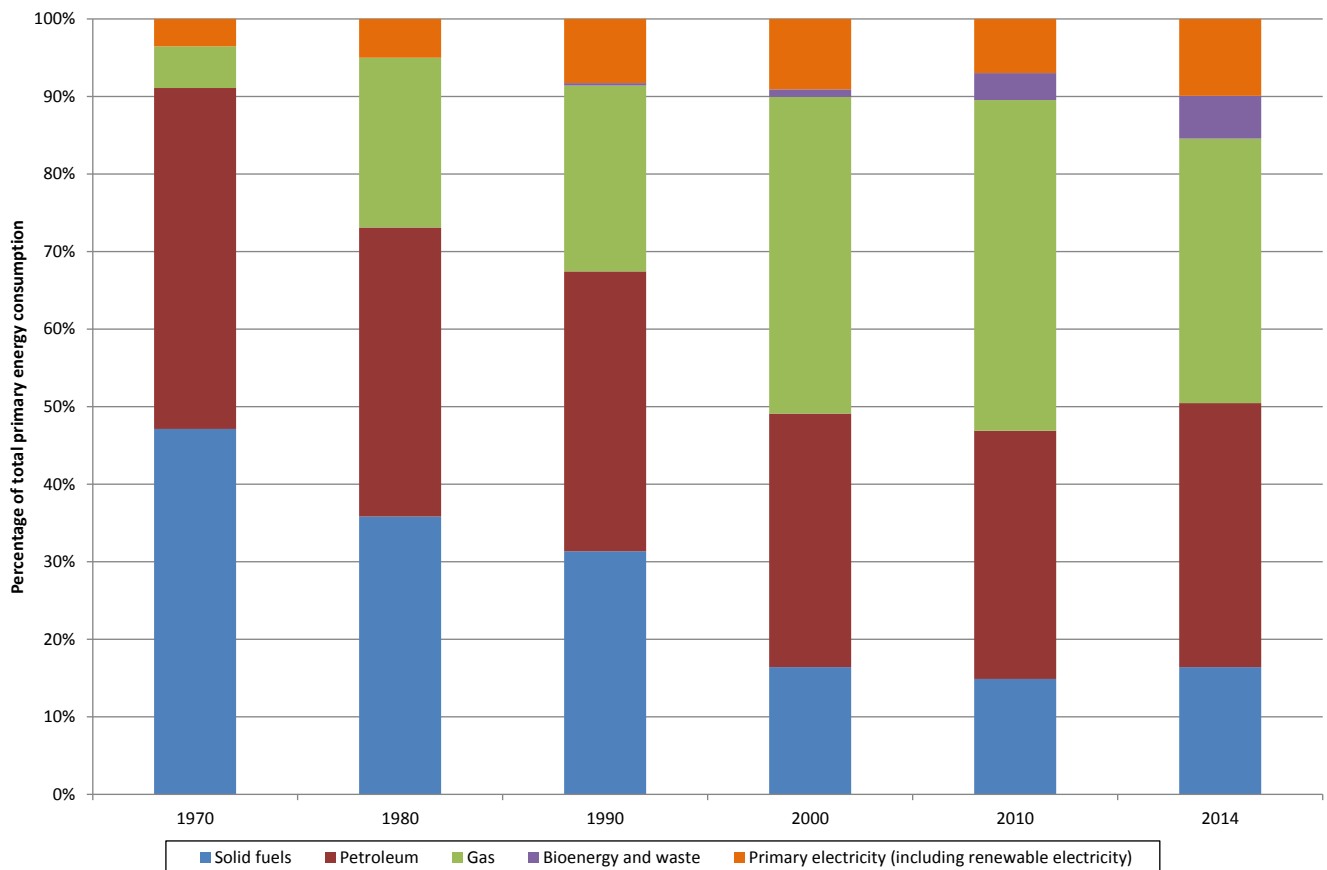
Source: DECC, ECUK Table 1.01

In 1970, primary 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 5.4 per cent and electricity 3.5 per cent, as can be seen in Chart 2.

By 1980 the fuel mix had evolved following North Sea gas coming on line; the proportion of solid fuel consumption fell to 36 per cent, petroleum to 37 per cent and natural gas' share increased to 22 per cent of all primary 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 2014 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 19 per cent of electricity generated in 2014 came from renewable sources, this is a 4.2 per cent increase from the previous year.

**Chart 2 Total primary energy consumption by fuel, UK, 1970 to 2014**



Source: DECC, ECUK Table 1.02

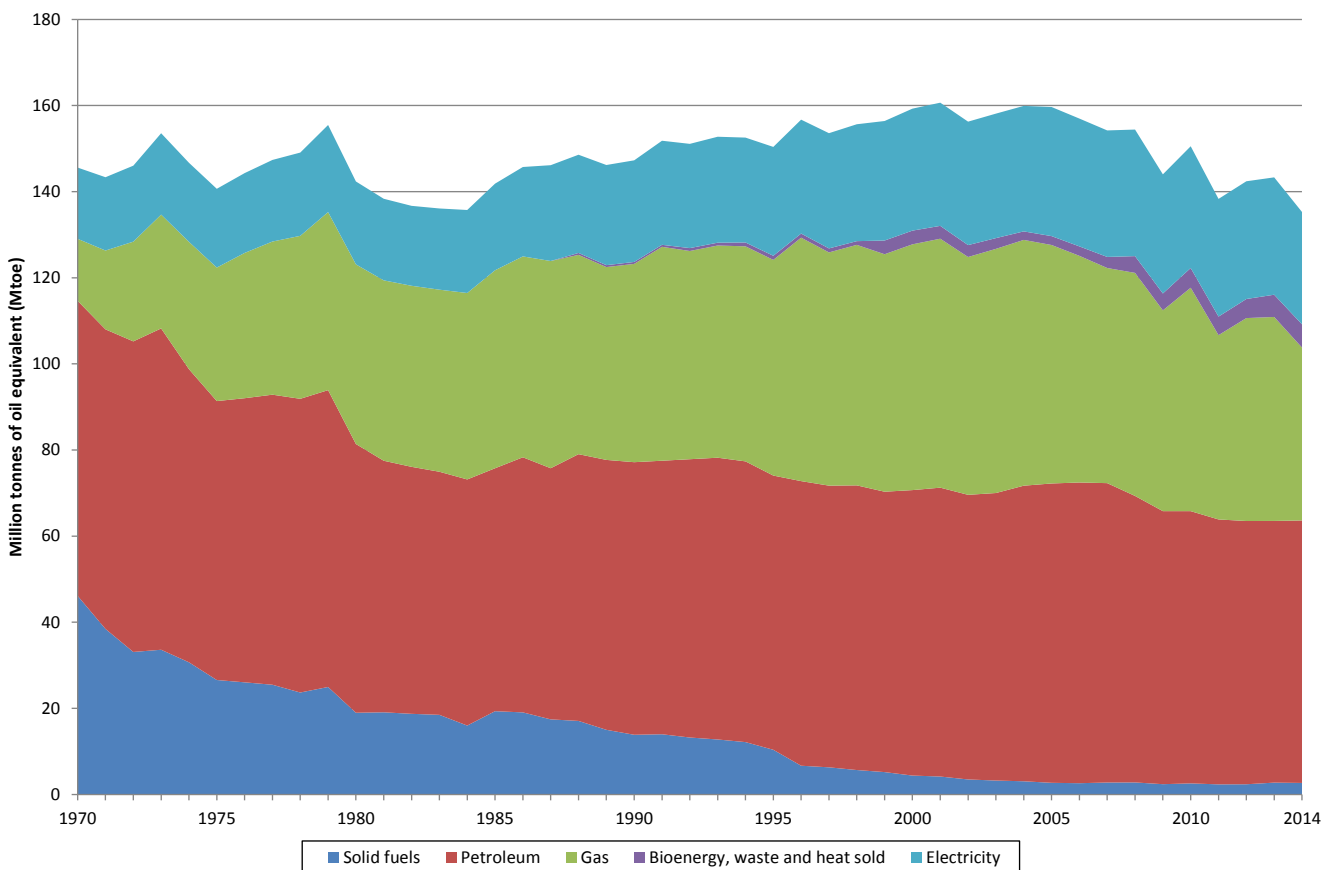
## 2. Overall final energy consumption between 1970 and 2014

Final consumption of energy products in 2014 was 142.8 Mtoe, of which 7.6 Mtoe were used for non-energy purposes. The remaining 135.3 Mtoe for energy purposes was the lowest since prior to 1970, and 25.6 Mtoe (16 per cent) lower than the peak in 2001 (160.9 Mtoe). Consumption was 8.1 per cent lower than in 1990 and 7.3 per cent lower than in 1970.

Final energy consumption in the UK has been decreasing since 2005 and has now returned to similar levels observed in the mid 1980s. The largest decrease occurred between 2010 and 2011 (8.1 per cent) which was mainly driven by the 18 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. Final energy consumption fell by 5.6 per cent between 2013 and 2014, the majority of which was due to a 7.2 Mtoe (15 per cent) decrease in gas consumption. As with the decrease from 2010 to 2011, warmer mean temperatures resulted in lower heating demand in 2014, though this didn't account for the total decrease in energy consumption; on a temperature adjusted basis, consumption fell by 2.6 per cent.

Chart 3 shows final energy consumption in the UK from 1970 to 2014 by fuel type.

**Chart 3 Final energy consumption by fuel, UK (1970 to 2014)**



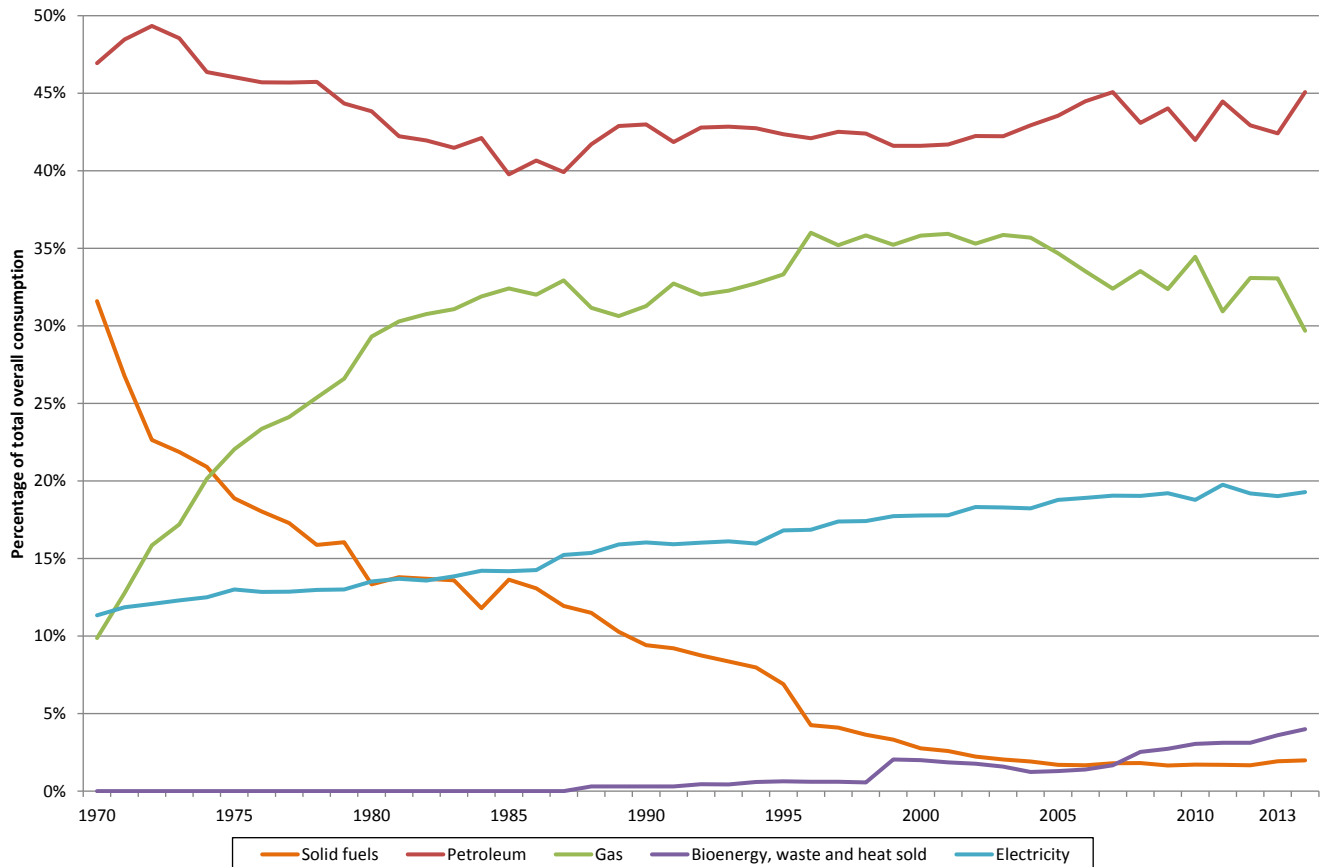
Source: DECC, ECUK Table 1.06

Since 1970, the overall final fuel mix in the UK has significantly changed from solid fuels; accounting for 45.0 Mtoe to only 2.6 Mtoe in 2014, largely replaced by gas which grew from 14.4 Mtoe in 1970 to 40.2 Mtoe in 2014.



Over the same period electricity consumption increased by 58 per cent, to 26.1 Mtoe, growing at a steady pace during the period. Since 1990 consumption of bioenergy and waste increased by 3.6 Mtoe (8.0 per cent). Chart 4 shows the changing fuel mix illustrating the increasing use of gas since the 1970s, specifically North Sea gas, being offset by declining solid fuels. Gas consumption growth began levelling off in the mid 1990s with consumption peaking in 2001. Since then, consumption has been falling with some volatility reflecting changes in average temperatures. Following a period of declining use of petroleum products from the 1970s to the mid 1980s, consumption has remained fairly steady since though continues to provide the largest source of energy consumption.

**Chart 4 Final energy consumption by fuel, UK (1970 to 2014)**

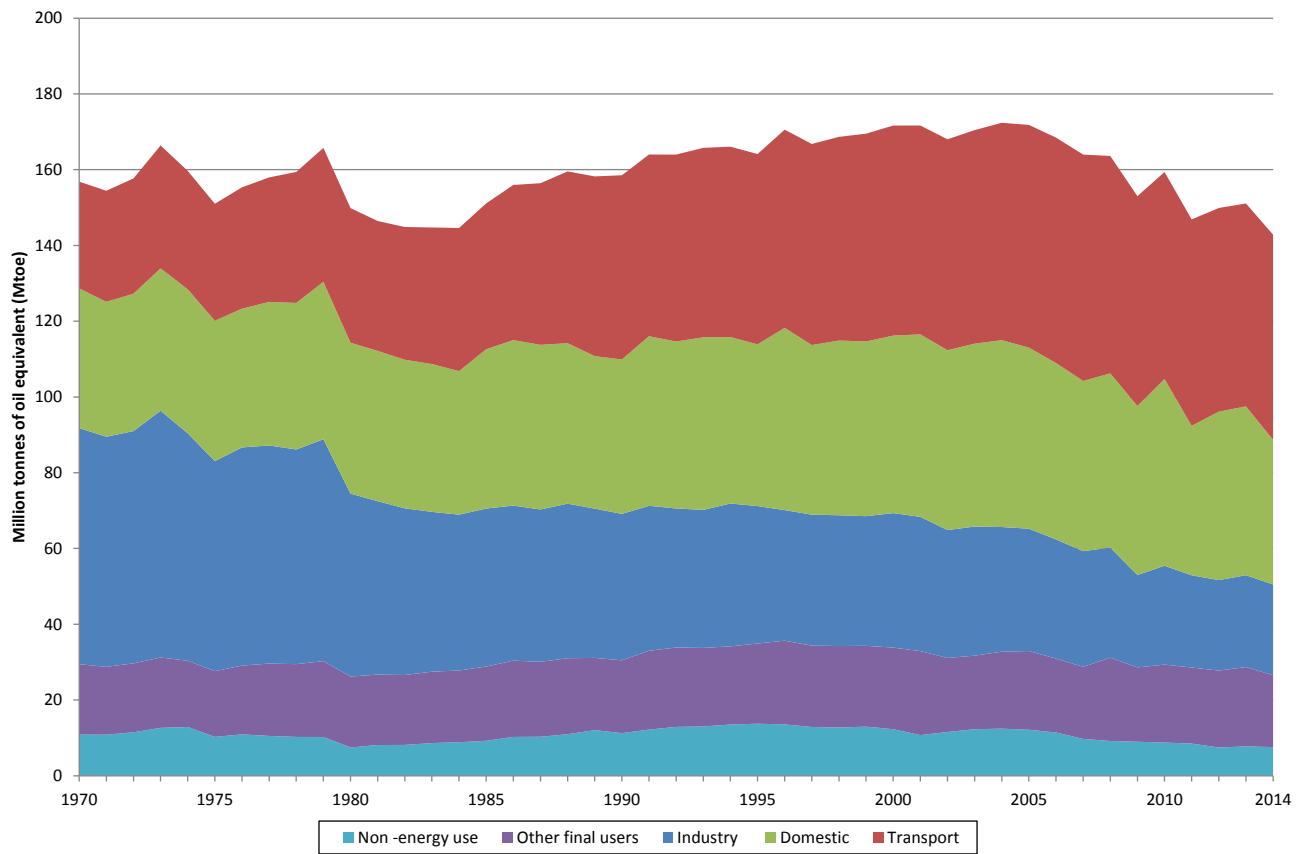


Source: DECC, ECUK Table 1.06

Chart 5 shows the changing levels of energy consumption by sector. In 1970, the industrial 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. By 2000 industrial use had reduced to 21 per cent of total final energy consumption, with transport, domestic and other users all increasing by one percentage point each. The decreasing trend in industrial consumption continued though in 2014 increased from 16 per cent in 2013 to 17 per cent. Transport consumption was responsible for 38 per cent, domestic use was 27 per cent and other use was 13 per cent.

**Chart 5** Final energy consumption by sector, UK (1970 to 2014)



Source: DECC, ECUK Table 1.05

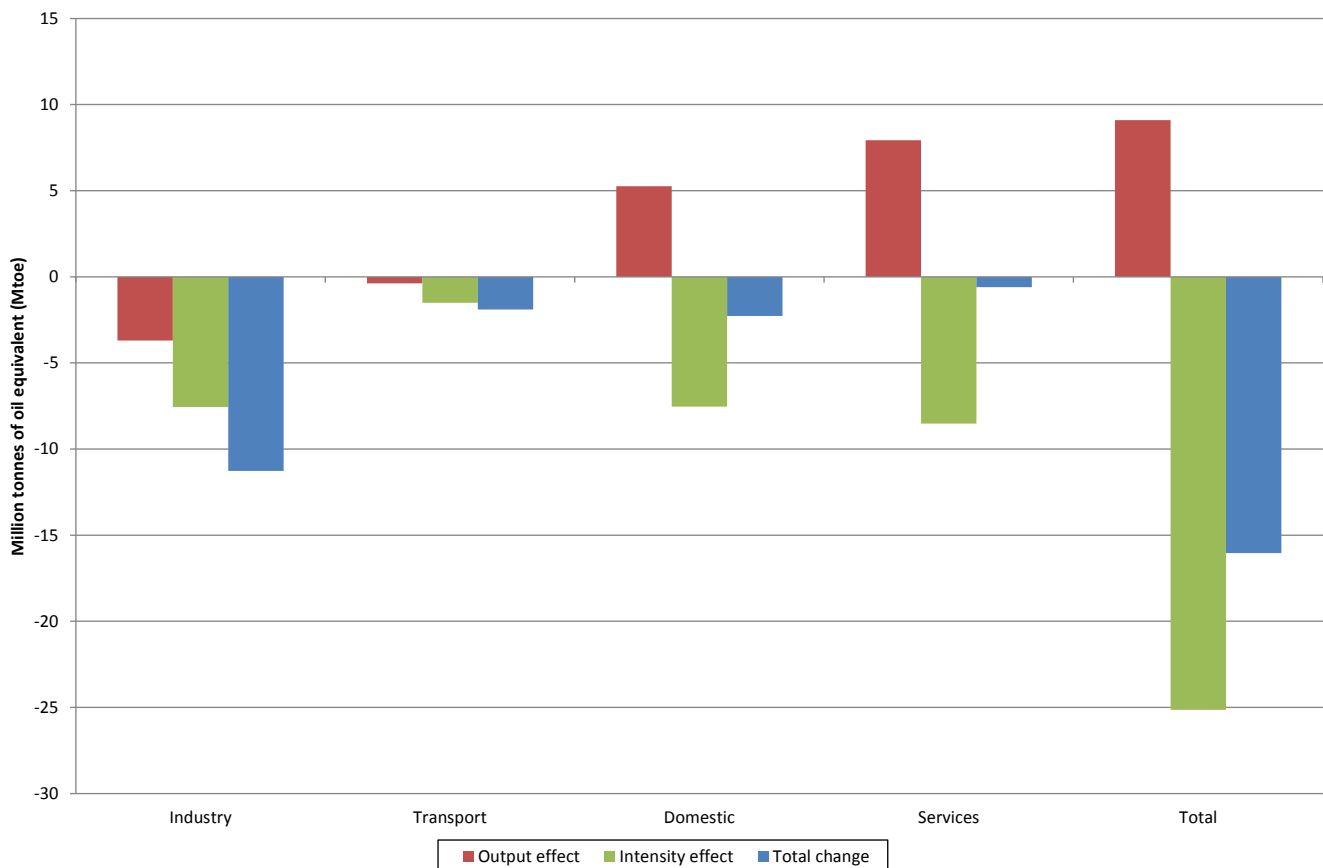
### 3. Factors affecting overall energy consumption between 2000 and 2013

Overall final energy consumption fell by 10 per cent (16.0 Mtoe) between 2000 and 2013. Over this time energy consumption by the industrial sector fell by almost one third (11.3 Mtoe), the domestic sector by 4.9 per cent (2.3 Mtoe), and the transport sector by 3.4 per cent (1.9 Mtoe); the services sector saw a percentage decrease of 2.8 per cent (0.6 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 2000 and 2013<sup>2</sup>, whilst Chart 7 shows the time series of intensity since 1970.

**Chart 6 Factors affecting changes in final energy consumption delivered by sector between 2000 and 2013**



Source: DECC, ECUK Table 1.13

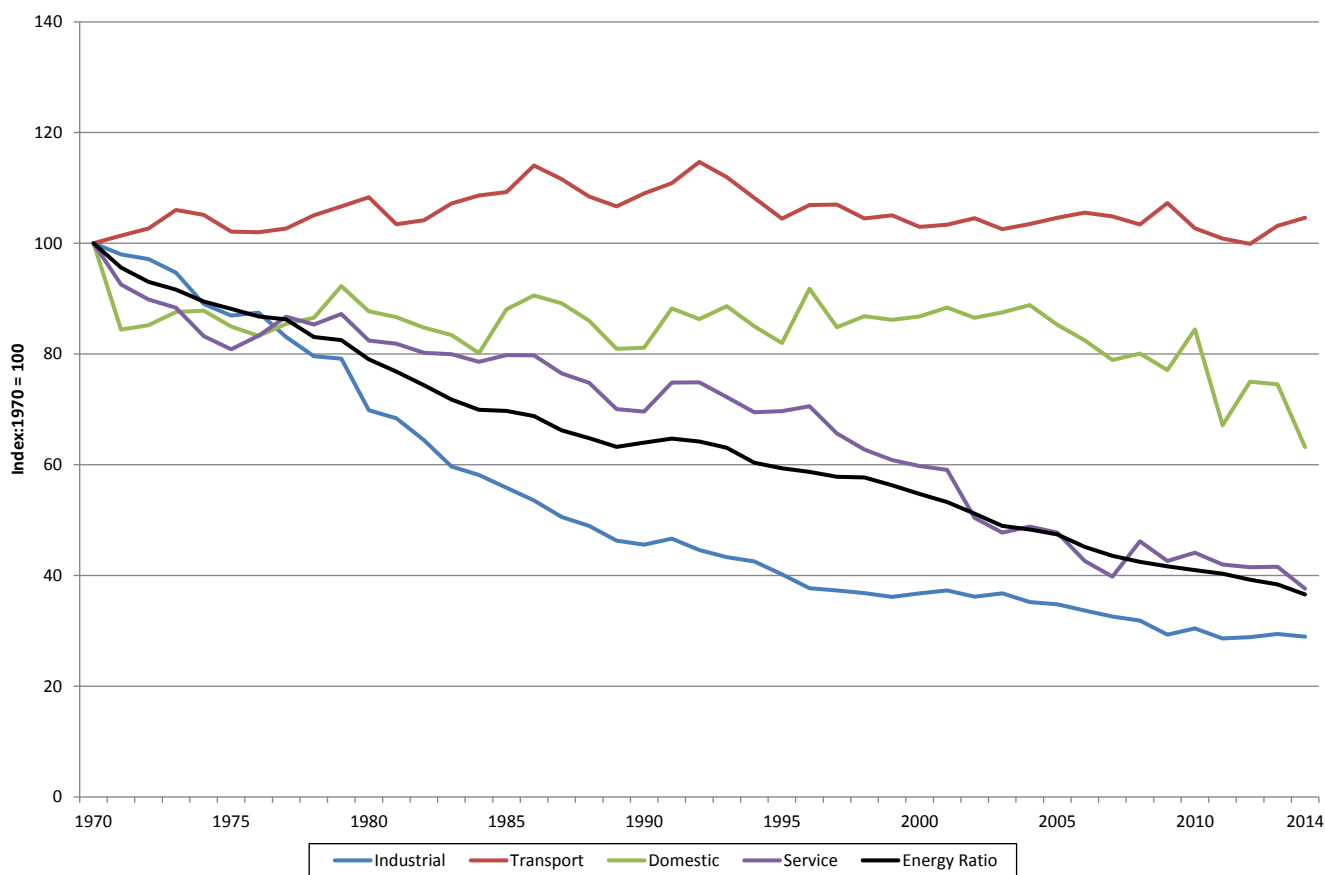
<sup>2</sup> Figures for 2014 are not available to calculate transport output and intensity. At time of publication, the latest published data by the Department for Transport were for 2013.

If the energy required to produce a unit of ‘output’ was the same in 2013 as in 2000, then it is estimated<sup>3</sup> that the energy consumption would have risen by an additional 9.1 Mtoe, however this increase was offset by a fall in energy intensity of 25.1 Mtoe, resulting in a net decrease in energy consumption of 16.0 Mtoe.

Chart 7 indicates that energy intensity in the industrial sector had fallen by 71 per cent between 1970 and 2014, a quicker rate than all other sectors (service sector down 62 per cent and the domestic sector down 37 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 changes in the domestic sector being dominated by weather related factors. Also contributing to the rate of decline in the domestic sector is the impact of recent energy efficiency improvements to the housing stock, especially since 2004.

The only sector to see no significant change between 1970 and 2014 was the transport sector which showed an increase of 5 per cent, with most 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.

**Chart 7 Energy intensity indicators by sector, UK (1970 to 2014)**



Source: DECC, ECUK Table 1.16

<sup>3</sup> For further details of the estimation please see Chapter 4 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>.

## Annex A Publication timetable for ECUK Chapter 1 tables in 2015

Users should note that in this edition of ECUK tables and analysis will be updated on a phased basis, so not all data will be available from the end of July as has been the case in previous editions.

The table below illustrates when each table for this chapter will be published.

## Publication timetable for ECUK Chapter 1 tables in 2015

Table number in publication (2015)	Table Name	To be published:
1.01	Total primary energy consumption unadjusted and temperature corrected and mean air temperatures 1970 to 2014	July
1.02	Final energy consumption by fuel, by sector in primary energy equivalents 1970 to 2014	July
1.03	Primary energy required per 1 tonne of oil equivalent of final energy demand 1970 to 2013	To be confirmed
1.04	Non transport energy consumption by end use 1990, 2000, 2010, 2011, 2012 and 2013	To be confirmed
1.05	Final energy consumption of energy products by sector 1970 to 2014	July
1.06	Final energy consumption by fuel 1970 to 2014	July
1.07	Overall energy consumption for heat and other end uses by fuel 2014 - provisional estimate	To be confirmed
1.08	Overall energy consumption for heat and other end uses by fuel 2013 - provisional estimate	To be confirmed
1.09	Overall energy consumption for heat and other end uses by fuel 2012 - provisional estimate	To be confirmed
1.10	Overall energy consumption for heat and other end uses by fuel 2011	July
1.11	Overall energy consumption for heat and other end uses by fuel 2010	July
1.12	Temperature corrected final energy consumption by sector and fuel 2002 to 2014	July
1.13	Output and intensity factors affecting the change in final energy consumption 2000 to 2013	July
1.14	Factors affecting the overall change in primary energy demand between 2000 and 2014	July
1.15	Factors affecting conversion losses between 2000 and 2014	July
1.16	Energy intensity by sector, and Gross Domestic Product 1970 to 2014	July

## Annex B Related DECC publications

Energy consumption statistics are also available in:

- **The Digest of UK Energy Statistics (DUKES).**

Much of the data contained in ECUK are based on estimates from DUKES. DUKES is an annual publication which includes tables, charts and commentary covering all the major aspects of energy, it provides a detailed and comprehensive picture of fuel production and consumption during the last three years.

The Digest is also available on the Internet. This includes some additional information including data (available in MS Excel format) from earlier years which are not contained in the printed copy publication. Available from The Stationery Office (0870 600 5522) or [www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes](http://www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes)

- **Energy Trends**

A quarterly publication which includes tables, charts and commentary covering all the major aspects of energy, it provides a comprehensive picture of energy production and use. Available on subscription (together with Quarterly Energy Prices) from DECC (0300 068 5041).

[www.gov.uk/government/collections/energy-trends](http://www.gov.uk/government/collections/energy-trends)

- **Sub-national consumption statistics**

The sub-national data contain estimates at regional, local authority and MSOA/LSOA (for electricity and gas consumption statistics) geographies. However, it is worth noting that the data are not comparable with DUKES and ECUK due to differing data sources.

A full summary of the sub-national consumption datasets available, along with links to relevant datasets, is included on pages 10 and 11 of the sub-national methodology and guidance booklet, which can be accessed here:

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/324877/Sub-national\\_methodology\\_and\\_guidance\\_booklet.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/324877/Sub-national_methodology_and_guidance_booklet.pdf).

- **National Energy Efficiency Data-framework (NEED)**

The National Energy Efficiency Data-Framework (NEED) was set up by DECC to provide a better understanding of energy use and energy efficiency in domestic and non-domestic buildings in Great Britain. The data framework matches gas and electricity consumption data with information on energy efficiency measures installed in homes. It also includes data about property attributes and household characteristics.

[www.gov.uk/government/collections/national-energy-efficiency-data-need-framework](http://www.gov.uk/government/collections/national-energy-efficiency-data-need-framework)

Comparisons between DUKES, ECUK and sub-national consumption statistics are summarised in Annex C (page 77) of the sub-national guidance and methodology booklet:

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/324877/Sub-national\\_methodology\\_and\\_guidance\\_booklet.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/324877/Sub-national_methodology_and_guidance_booklet.pdf).

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