



Department
of Energy &
Climate Change

Energy Consumption in the UK (2014)

Chapter 1: Overall energy consumption in the UK
since 1970

31 July 2014

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Overall energy consumption in the UK since 1970

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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' published on Thursday 31 July 2014:

<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 2013.
- **Overall** final energy consumption between 1970 and 2013.
- **Factors** affecting overall energy consumption between 1970 and 2012.

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 sector – where consumption from the transport sector represents 36 per cent of consumption in 2013, the domestic sector 29 per cent, the industrial sector 16 per cent and the services sector 14 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.

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.
- **Thousand tonnes of oil equivalent (ktoe)** – 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)¹.

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

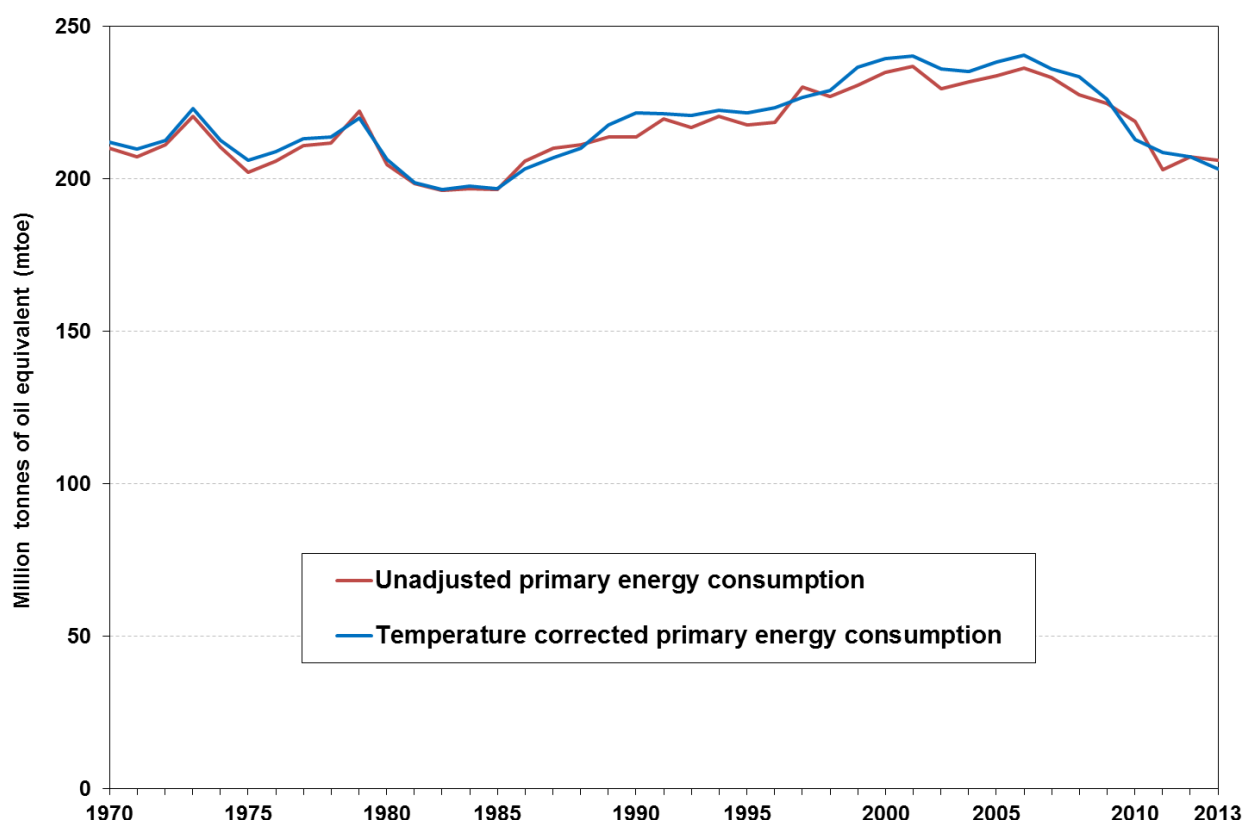
1. Overall energy consumption in primary terms between 1970 and 2013

In 2013, total UK overall primary energy consumption in primary energy terms (that is, fuels obtained directly from natural sources) was 205.9 million tonnes of oil equivalent (mtoe), ½ per cent lower than in 2012, and 1½ per cent higher than the 2011 level which – at 202.9 mtoe – had been the lowest level of UK primary energy consumption for over 25 years. The level of primary energy consumption in 2013 was 12 per cent lower than in 2000, 4 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 2013 was at its lowest since 1985 at 203.2 mtoe. Between 2000 and 2013 primary energy consumption on a temperature correct basis fell by 15 per cent; it was 8 per cent lower than in 1990, and was 4 per cent lower than in 1970. There was a 2 per cent fall in temperature adjusted consumption between 2012 and 2013.

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 2013)



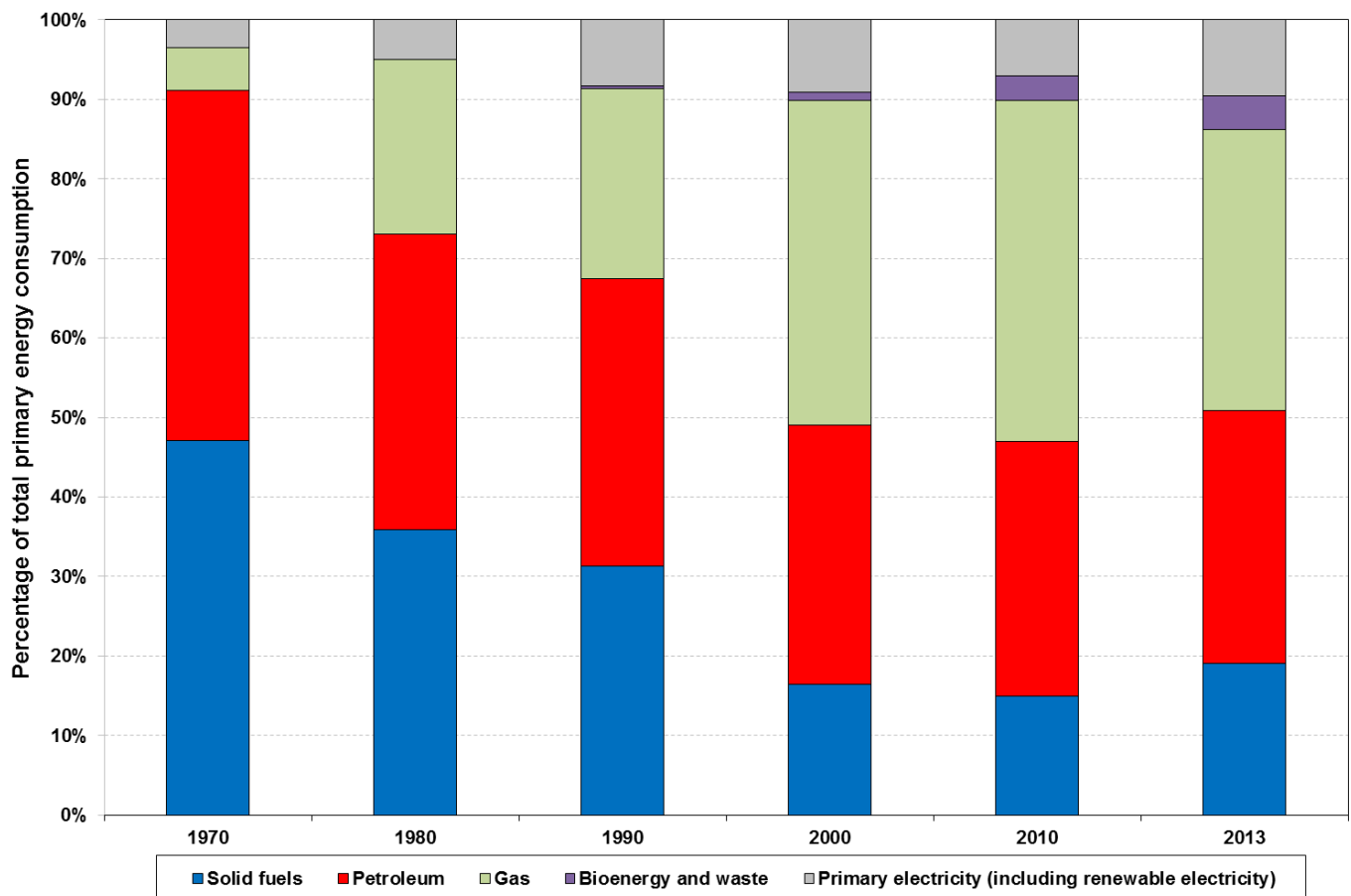
Source: DECC, ECUK Table 1.01

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 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 2013 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 15 per cent of electricity generated in 2013 came from renewable sources.

Chart 2 Total primary energy consumption by fuel, UK, 1970 to 2013



Source: DECC, ECUK Table 1.02

2. Overall final energy consumption between 1970 and 2013

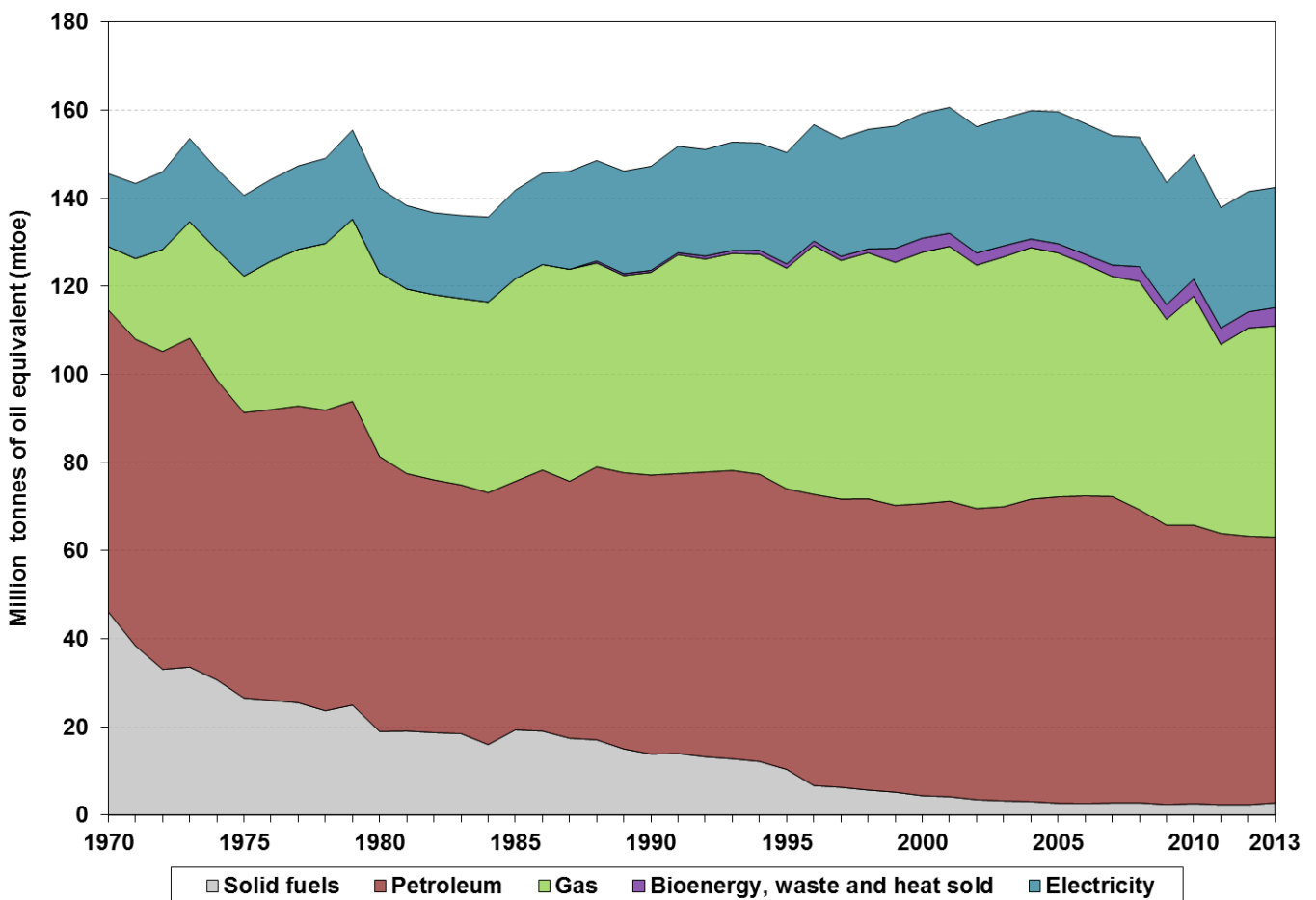
Final consumption of energy products in 2013 was 150.1 mtoe, of which 7.6 mtoe were used for non-energy purposes. The remaining 142.5 mtoe for energy purposes was 11 per cent lower than in 2000, 3 per cent lower than in 1990 and 2 per cent lower than in 1970.

The most recent three years have shown the lowest level of final energy consumption in the UK since the mid 1980s. 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 in the two most recent years, when more gas was used in the winter heating season as temperatures were cooler.

Final energy consumption, excluding non-energy use, was 1 per cent higher than in 2012 reflecting in part the cold early months of the year, but was 2 per cent lower on a temperature controlled basis.

Chart 3 shows final energy consumption in the UK from 1970 to 2013 by fuel type.

Chart 3 Final energy consumption by fuel, UK (1970 to 2013)

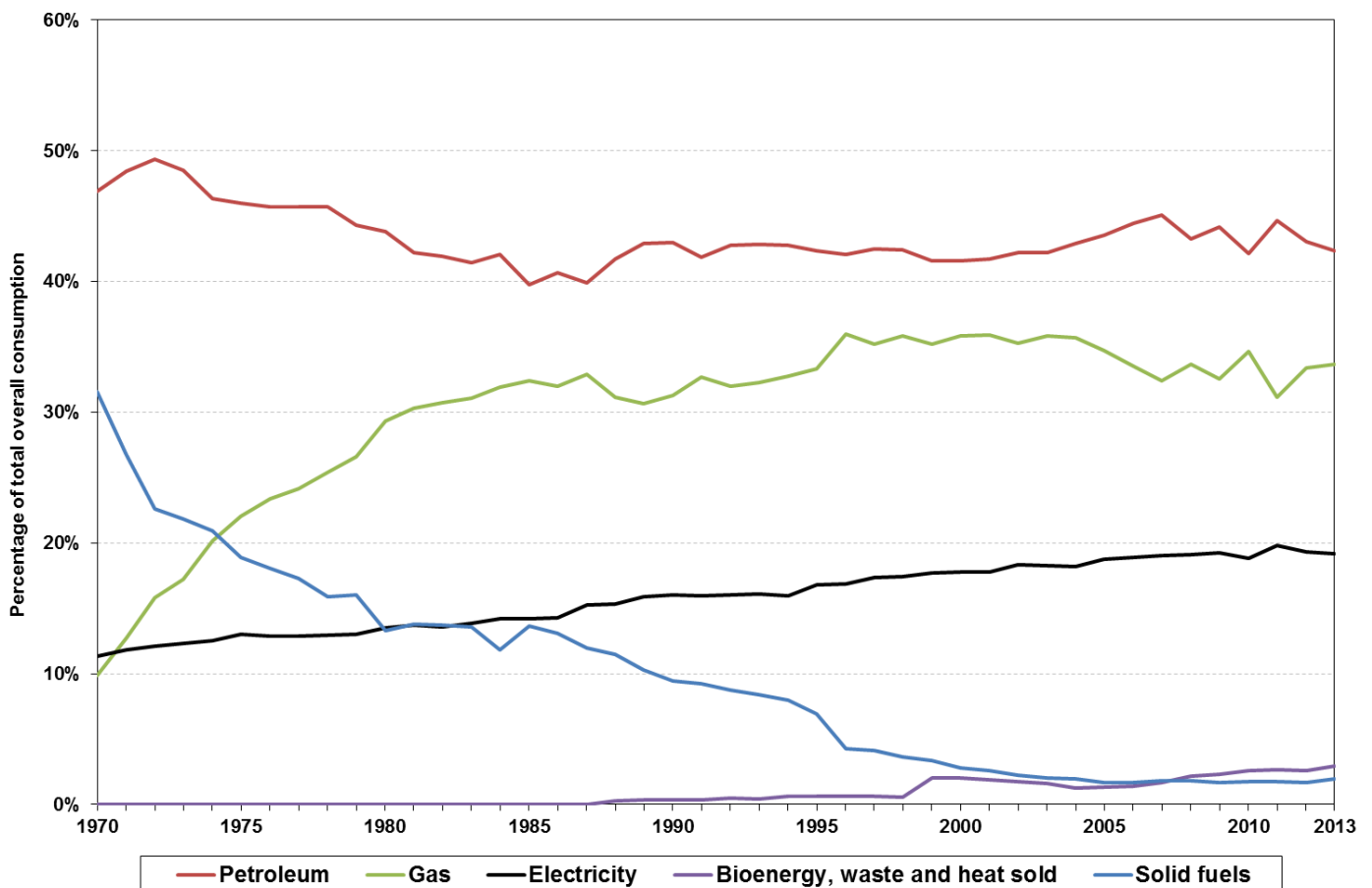


Source: DECC, ECUK Table 1.06

Since 1970, the overall final fuel mix in the UK has significantly changed from solid fuels; accounting for 46.1 mtoe to only 2.8 mtoe in 2013, largely replaced by gas which grew from 14.4 mtoe in 1970 to 47.9 mtoe in 2013.

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 2.9 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 2013)



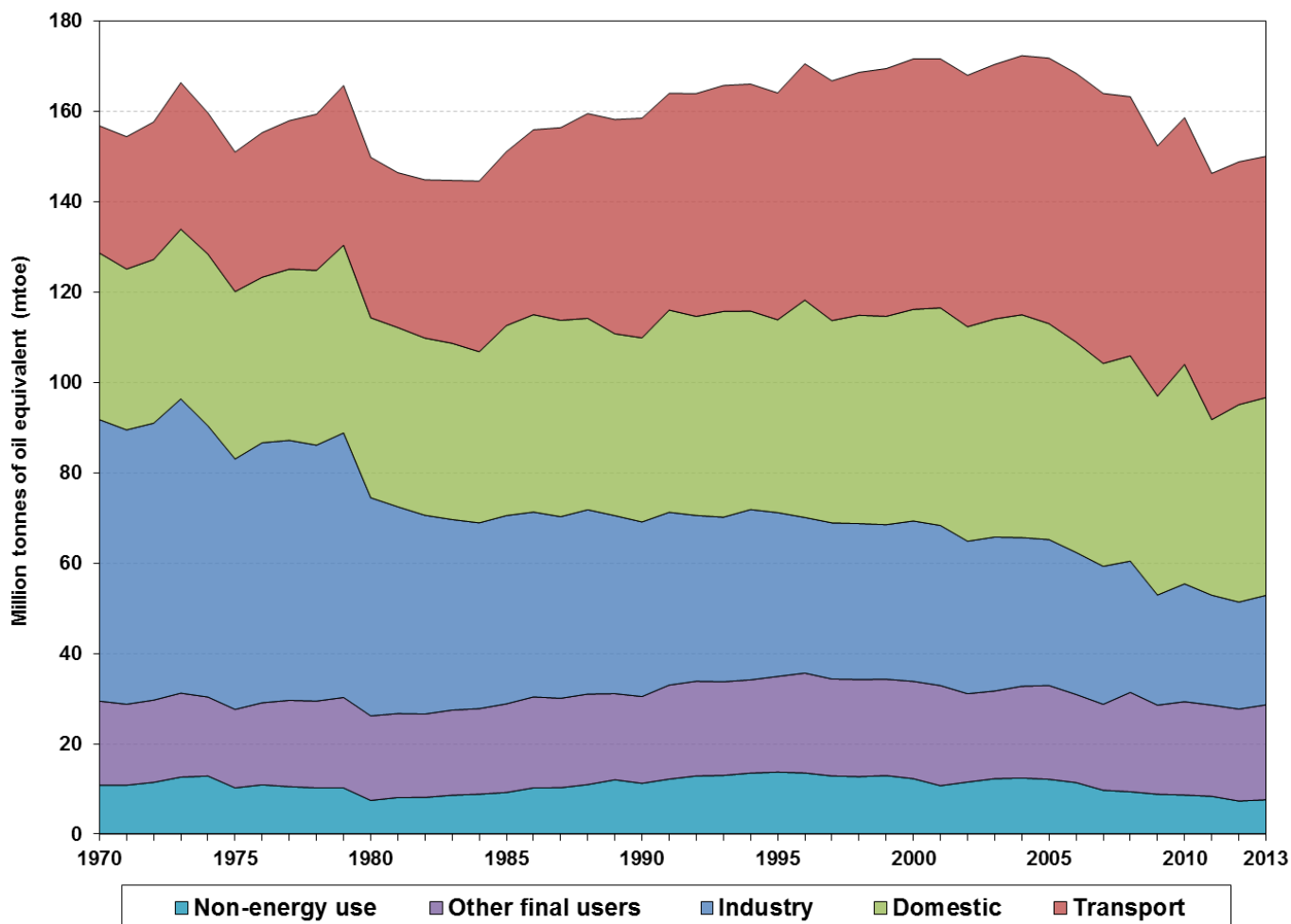
Source: DECC, ECUK Table 1.06

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. 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 and in 2013 accounted for 16 per cent of total final energy consumption in the UK, with transport consumption responsible for 36 per cent, domestic use was 29 per cent and other use at 14 per cent.

Chart 5 Final energy consumption by sector, UK (1970 to 2013)



Source: DECC, ECUK Table 1.05

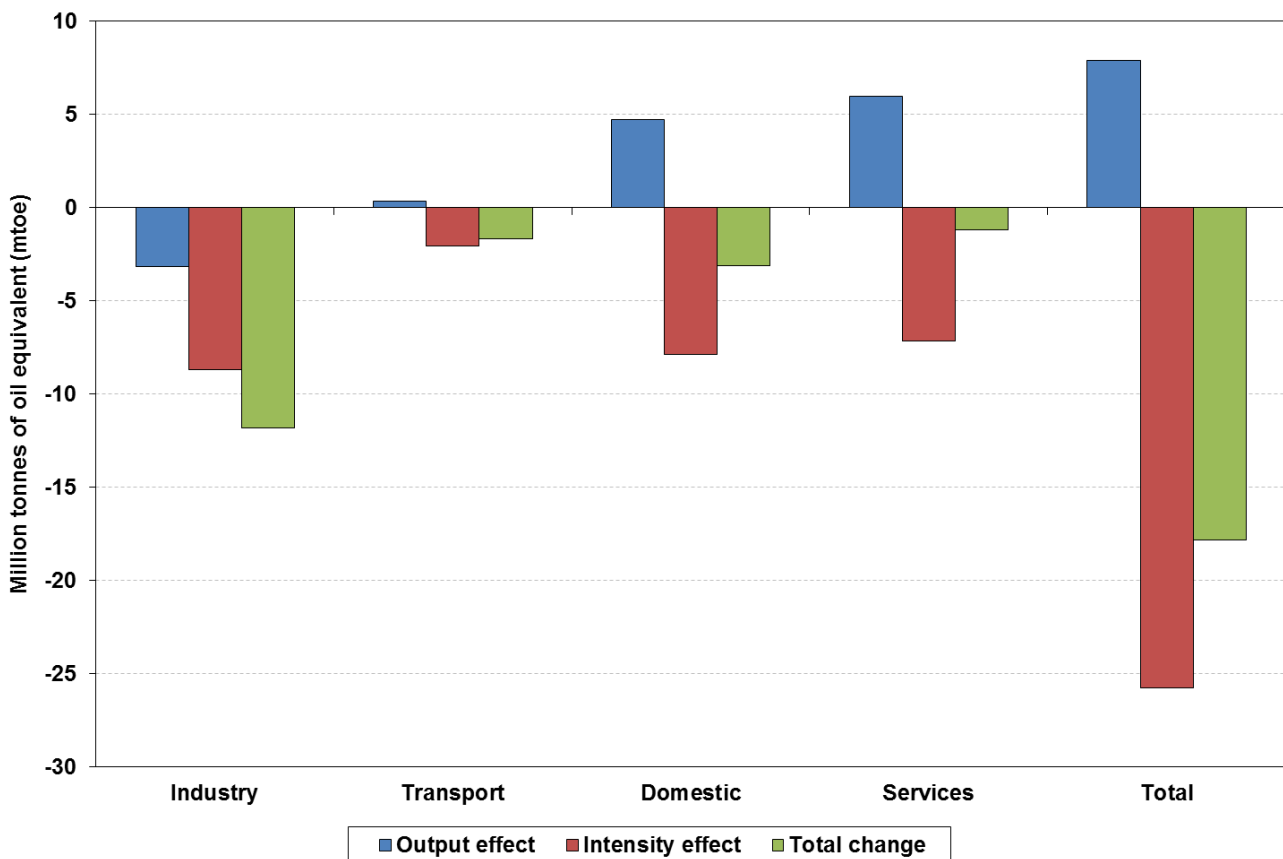
3. Factors affecting overall energy consumption between 2000 and 2012

Overall energy consumption fell by 11 per cent (17.8 mtoe) between 2000 and 2012. Over this time energy consumption by the industry sector fell by one third (11.8 mtoe), the domestic sector by 7 per cent (3.1 mtoe), and the services sector by 5 per cent (1.2 mtoe); the transport sector saw the smallest percentage decrease of 3 per cent (1.7 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 2012², whilst Chart 7 shows the time series of intensity since 1970.

Chart 6 Factors affecting changes in final delivered by sector between 2000 and 2012



Source: DECC, ECUK Table 1.12

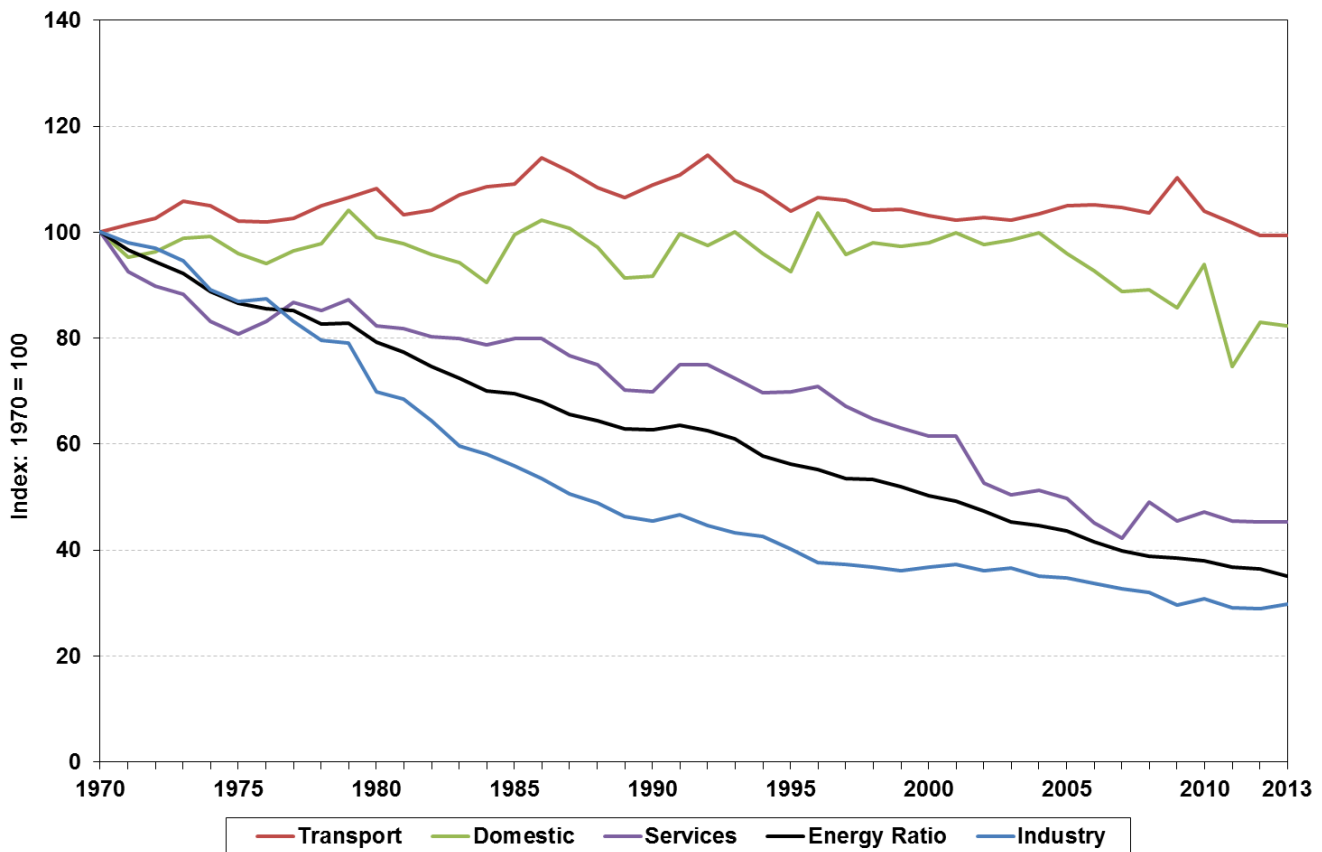
² Figures for 2013 are not available to calculate transport output and intensity. At time of publication, the latest published data by the Department for Transport were for 2012.

If the energy required to produce a unit of ‘output’ was the same in 2012 as in 2000, then it is estimated³ that the energy consumption would have risen by an additional 7.9 mtoe, however this increase was offset by a fall in energy intensity of 25.8 mtoe, resulting in a net decrease in energy consumption of 17.8 mtoe.

Chart 7 indicates that energy intensity in the industrial sector had fallen by 70 per cent between 1970 and 2013, a quicker rate than all other sectors (service sector down 55 per cent and the domestic sector down 18 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 and 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 2013 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.

Chart 7 Energy intensity indicators by sector, UK (1970 to 2013)



Source: DECC, ECUK Table 1.15

³ 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 2014

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.

Table **Publication timetable for ECUK Chapter 1 tables in 2014**

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

- **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

- **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, alongwith 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.

- **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

Comparisons between DUKES, ECUK and sub-national consumption statistics are summarised in Annex C (page 76) 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.

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