



Department
of Energy &
Climate Change

Energy Consumption in the UK (2015)

Chapter 3: Domestic energy consumption in the UK
between 1970 and 2014

30 July 2015

Energy Consumption in the UK (2015)

Domestic energy consumption in the UK between 1970 and 2014

Statistician

Responsible: Liz Waters

Prepared by: Victoria Goodright

Emily Wilkes

Energy Consumption in the UK

EnergyEfficiency.Stats@decc.gsi.gov.uk

Contents

Background.....	4
Key terms used in this document.....	4
1. Overall domestic sector energy consumption in 2014.....	5
2. Domestic sector energy consumption by fuel type between 1970 and 2014.....	6
3. Average domestic gas and electricity consumption between 2008 and 2014	7
4. Domestic sector energy consumption per head and by income between 1970 and 2014.....	8
5. Use of electricity by appliance type between 1970 and 2014.....	9
6. Energy efficiency improvements in appliances between 1990 and 2014	11
7. Factors affecting domestic energy consumption between 1990 and 2014.....	13
Annex A Publication timetable for ECUK Chapter 3 tables in 2015.....	14
Annex B Related DECC publications.....	17

Background

This factsheet provides a brief overview of the trends and some key drivers that have influenced energy consumption within the domestic sector in the UK since 1970. Analysis is based on data from DECC's annual publication 'Energy consumption in the UK' published on Thursday 30 July 2015: <https://www.gov.uk/government/publications/energy-consumption-in-the-uk>.

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

- **Overall** domestic sector energy consumption in 2014.
- Domestic sector energy consumption by **fuel type** between 1970 and 2014.
- Average domestic gas and electricity consumption between 2008 and 2014.
- Domestic sector energy consumption **per head and by income** between 1970 and 2014.
- Use of electricity by **appliance type** between 1970 and 2014.
- **Energy efficiency improvements** in appliances between 1990 and 2014.
- **Factors** affecting domestic energy consumption between 1990 and 2014.

This factsheet also contains publication plans for each table and a summary of related DECC publications in the Annex. 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 to explain 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** – 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.
- **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)¹.

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

1. Overall domestic sector energy consumption in 2014

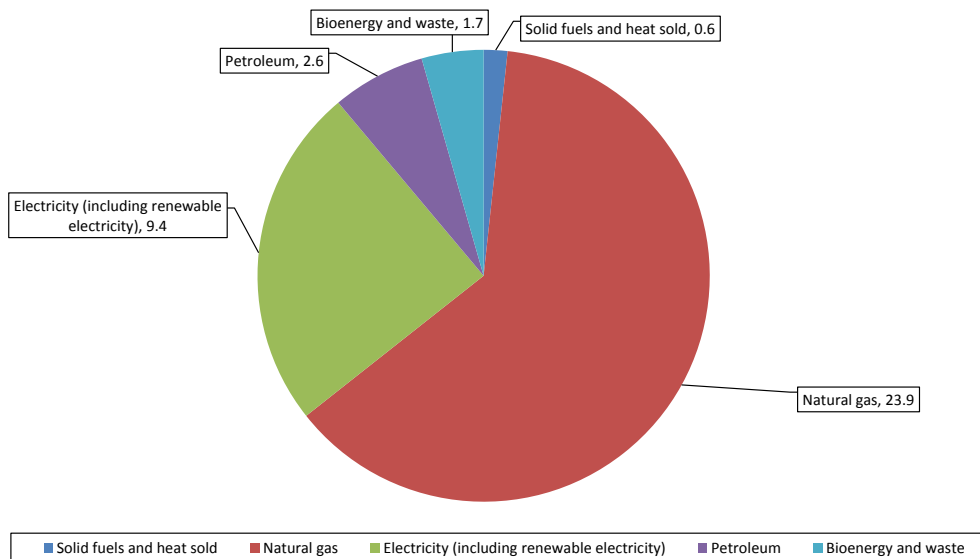
In 2014, energy consumption from the domestic sector (excluding transport use) was 38.2 million tonnes of oil equivalent (Mtoe), a fall of 6.4 Mtoe (14 per cent) compared to 2013. This coincides with the warmest average temperature since prior to 1970, particularly during the heating season, with average heating degree days 19 per cent lower than the long term mean (1981 to 2010).

Since 2000 domestic energy use has decreased by 19 per cent, whilst there has been an increase of 12 per cent in the number of UK households and a 9.7 per cent increase in the UK population. At a per household level, energy consumption is the lowest since prior to 1970 and has fallen by 37 per cent since 1970, with the bulk of the decrease occurring since 2004 (29 per cent). Since 2013, consumption per household has decreased by 15 per cent, consistent with warmer average temperatures, particularly during the winter months. This compares to a 21 per cent decrease from 2010 to 2011, also reflecting unusually warmer average temperature.

Domestic consumption as a proportion of the total UK final consumption of energy products was 27 per cent, a 1 percentage point increase compared to 1990.

Chart 1 below shows final domestic consumption in 2014, by fuel type.

Chart 1 Domestic consumption by fuel (Mtoe), UK (2014)

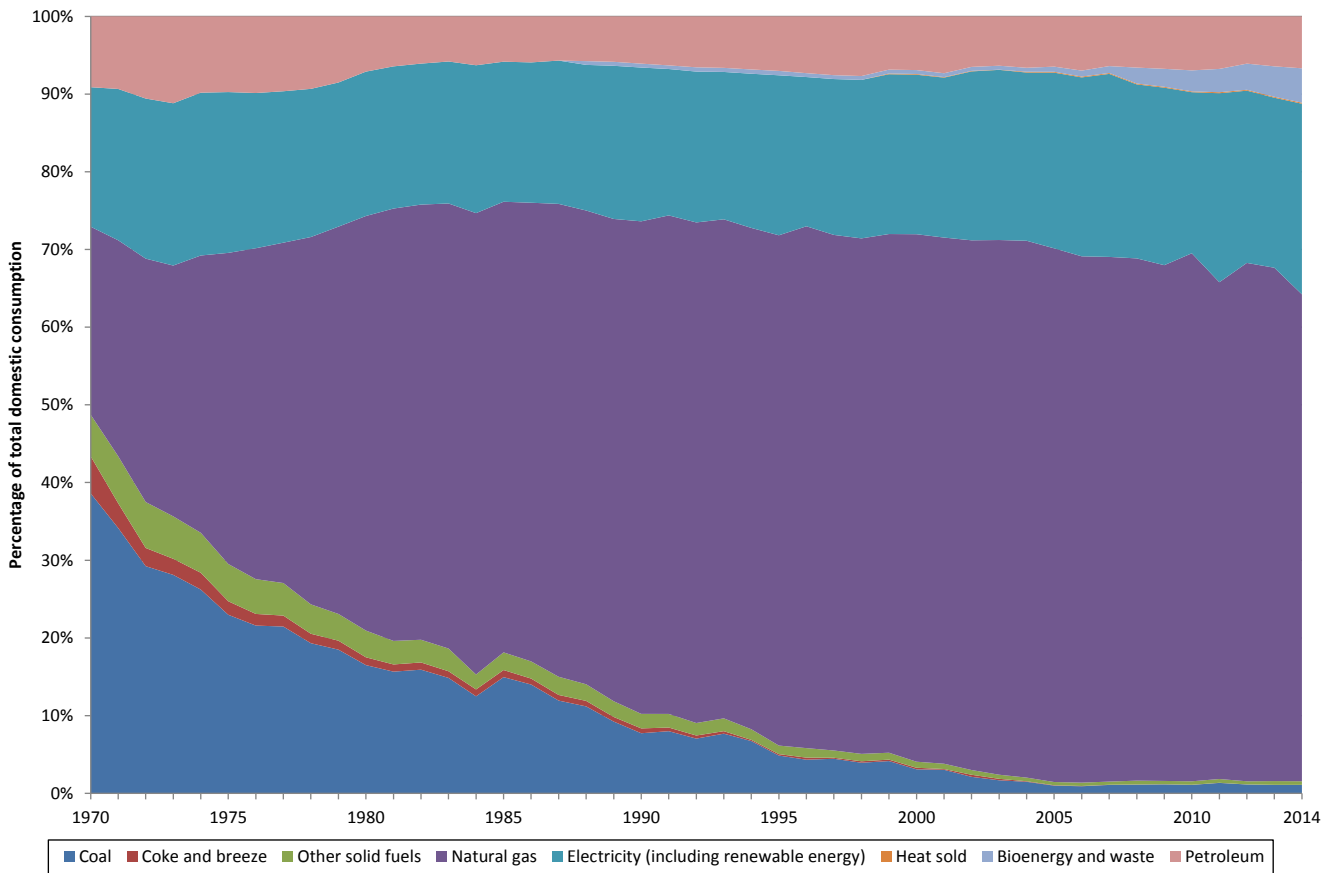


Source: DECC, ECUK Table 3.03

2. Domestic sector energy consumption by fuel type between 1970 and 2014

The fuel mix for domestic consumption has significantly changed since 1970 when 39 per cent of consumption was coal, 24 per cent natural gas and 18 per cent electricity; this changed to 3 per cent coal, 68 per cent natural gas and 21 per cent electricity in 2000; and to 1 per cent coal, 63 per cent natural gas and 25 per cent electricity in 2014 (Chart 2). There was a 19 per cent reduction in natural gas from 2013 to 2014. Bioenergy represents an increasing share of domestic consumption; from 0.5 per cent in 1988 to 4.4 per cent in 2014.

Chart 2 Domestic consumption by fuel, UK (1970 to 2014)



Source: DECC, ECUK Table 3.03

3. Average domestic gas and electricity consumption between 2008 and 2014

Chart 3 displays average domestic electricity consumption per household and average gas consumption per gas customer. The chart also provides a temperature corrected average for both average gas and electricity consumption. When temperature is taken into account, the difference in average electricity consumption is minimal. However, temperatures have a bigger impact on domestic gas consumption.

Chart 3 Average domestic (unadjusted and temperature corrected) gas and electricity consumption, UK (2008 to 2014)



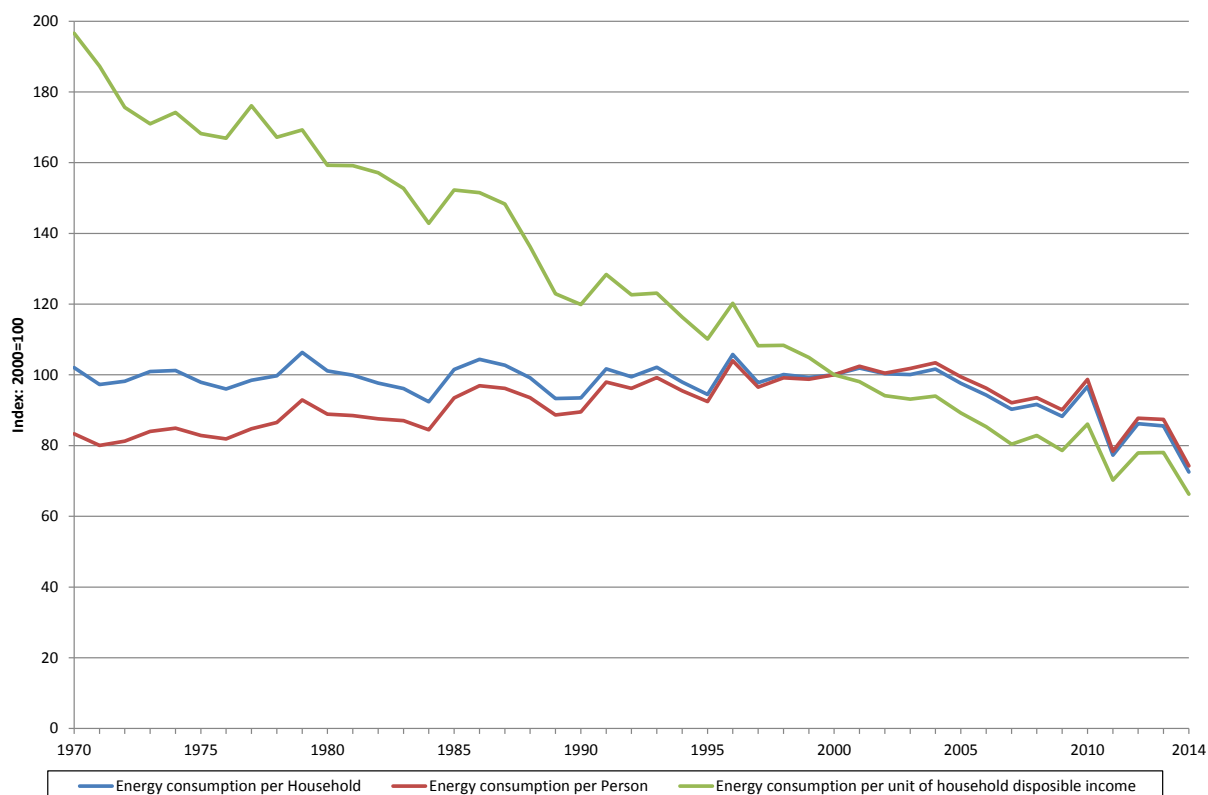
Source: DECC, ECUK Tables 3.07

The average unadjusted electricity consumption per household in 2014 was 4,001 kilowatt hours (kWh), which increases slightly to 4,115 kWh once a temperature factor has been applied to the data. Average unadjusted gas consumption per customer in 2014 was 12,404 kWh; this adjusts to 14,263 kWh once a temperature factor has been applied to the data, which takes into consideration that 2014 was warmer than average, specifically in the early months of the year.

4. Domestic sector energy consumption per head and by income between 1970 and 2014

Factors affecting domestic energy consumption include the number of households, the energy efficiency of households, the population and household income. These factors can be used to measure the energy intensity in the domestic sector and are shown in Chart 4 below.

Chart 4 Domestic energy consumption per person, per household and per unit of household income, UK (1970 to 2014)



Source: DECC, ECUK Table 3.35

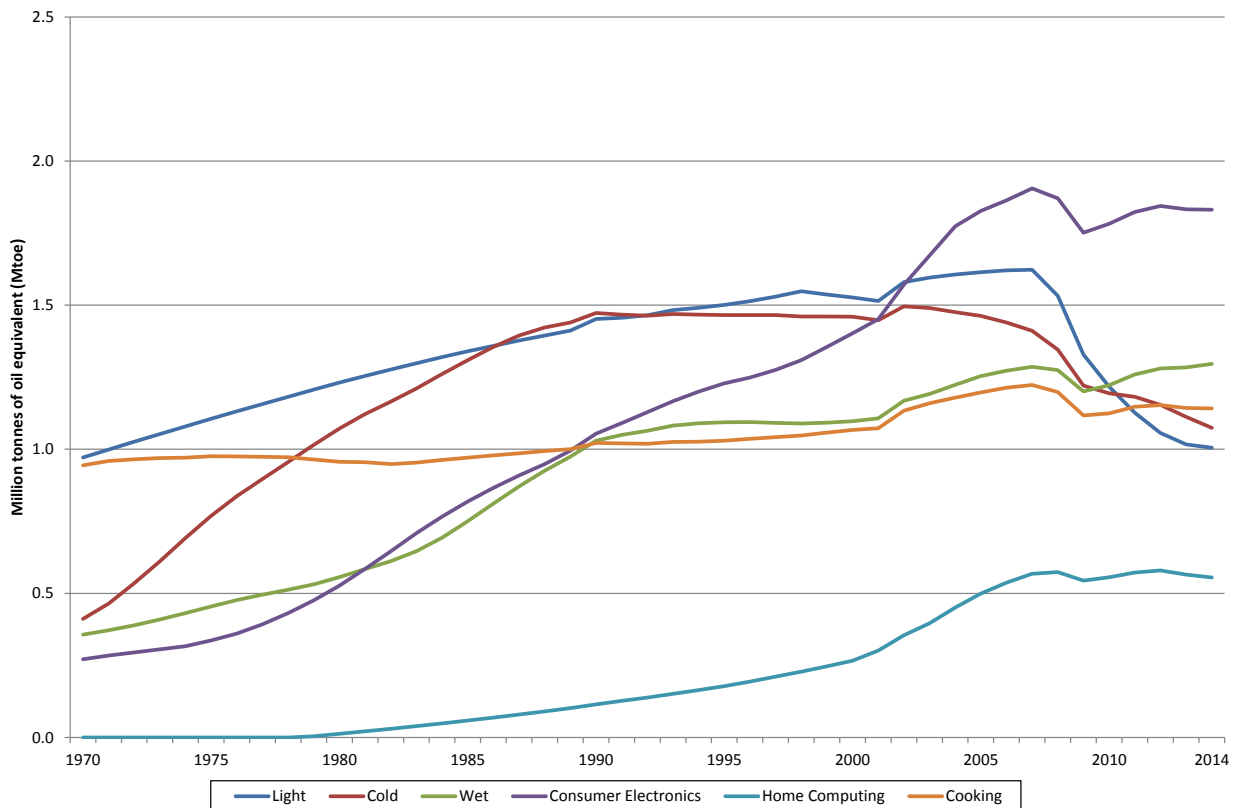
Energy consumption per unit of household disposable income has fallen by 34 per cent since 2000, whilst energy consumption per household has fallen by 27 per cent and energy consumption per person fallen by 26 per cent, reflecting an increase in energy efficiency. Compared with the previous year, 2013, a fall of 15 per cent in energy consumption per household and per person was recorded.

5. Use of electricity by appliance type between 1970 and 2014

The total amount of electricity consumption by household domestic appliances between 1970 and 2014 grew by around 2.0 per cent per year over this period.

Chart 6 shows that in 2014, consumer electronics were the largest consuming group of domestic appliances with an estimated consumption of 1.8 Mtoe, followed by wet appliances with an estimated consumption of 1.3 Mtoe. This is closely followed by cooking with an estimated consumption of 1.1 Mtoe, cold appliances, 1.1 Mtoe, and lighting with 1.0 Mtoe.

Chart 5 Electricity consumption by household domestic appliance, by broad type, UK (1970 to 2014)



Source: Market Transformation Programme

Between 1970 and 2014 electricity consumption from consumer electronics increased by a factor of almost seven, wet appliances by over three and a half times, and cold appliances by over two and a half times. Since 1990, electricity consumption from consumer electronics increased by 74 per cent and wet appliances by 26 per cent.

Electricity consumption from lighting fell by 31 per cent between 1990 and 2014, an average of 1.4 per cent per year. The reduction in electricity consumption for lighting is greater between 2009 and 2012 as The European Union regulated that the sale of conventional (clear) light bulbs would be phased out between 2009 and 2012, beginning with the highest wattage bulbs. Between 2009 and 2012, energy consumption for lighting decreased by 21 per cent, an average of 7.3 per cent per year. Between 2009 and 2012, the number of standard light bulbs fell by

almost 260,000 (77 per cent) and continued to fall in 2013 and 2014. This compares with an increase of 200,000 (132 per cent) of energy efficient light bulbs between 2009 and 2012.

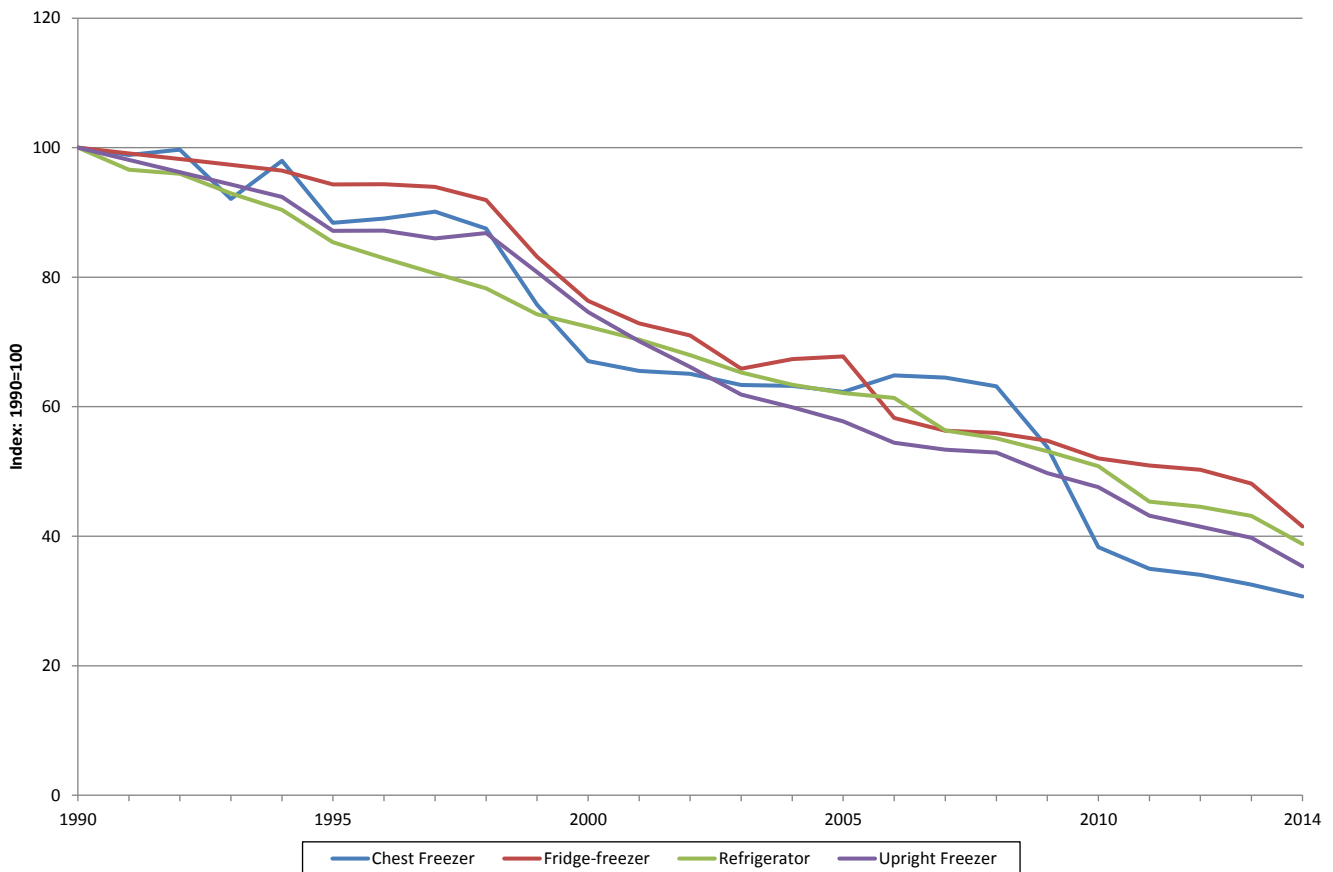
Home computing, which had no recorded energy use in 1970, more than doubled between 2000 and 2014. Consumption by home computing appliances fell for the first time between 2008 and 2009 by 5.1 per cent, and again between 2012 and 2014, by 4.3 per cent.

6. Energy efficiency improvements in appliances between 1990 and 2014

Improvements in energy efficiency have helped to reduce total domestic energy consumption in the UK, both through improvements to the energy efficiency of appliances (such as fridges/freezers, light bulbs, and so on) but also through improving the energy efficiency of buildings through insulation and more energy efficient heating systems.

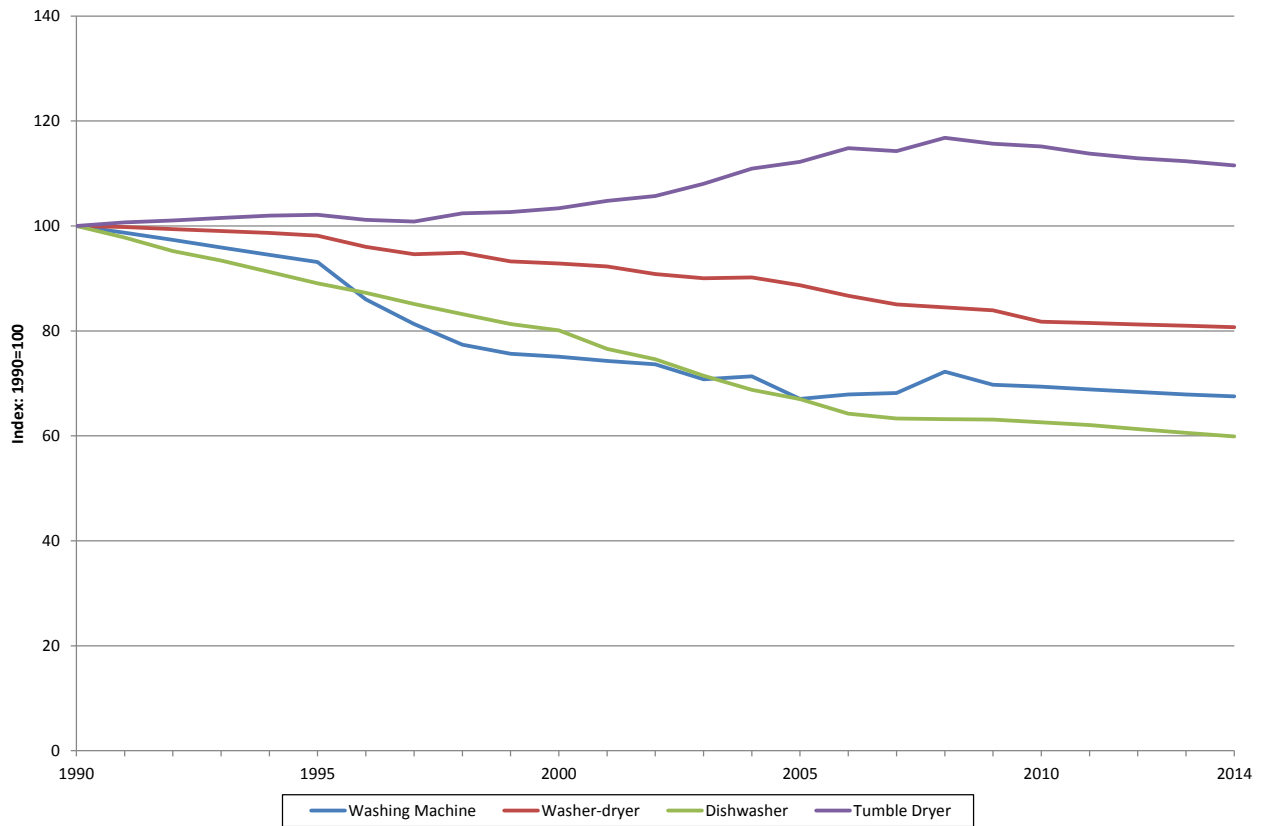
Energy efficiency for new cold appliances (Chart 6) improved most for chest freezers which consumed 69 per cent less electricity in 2014 than in 1990. Over the same period energy consumption for new upright freezers fell by 65 per cent and for new refrigerators by 61 per cent. For wet appliances (Chart 7), efficiency improvements have been greatest in new dishwashers which demonstrated a 40 per cent improvement, and washing machines with a 32 per cent improvement.

Chart 6 Average energy consumption of new cold appliances, UK (1990 to 2014)



Source: Market Transformation Programme

Chart 7 Average energy consumption of new wet appliances, UK (1990 to 2014)



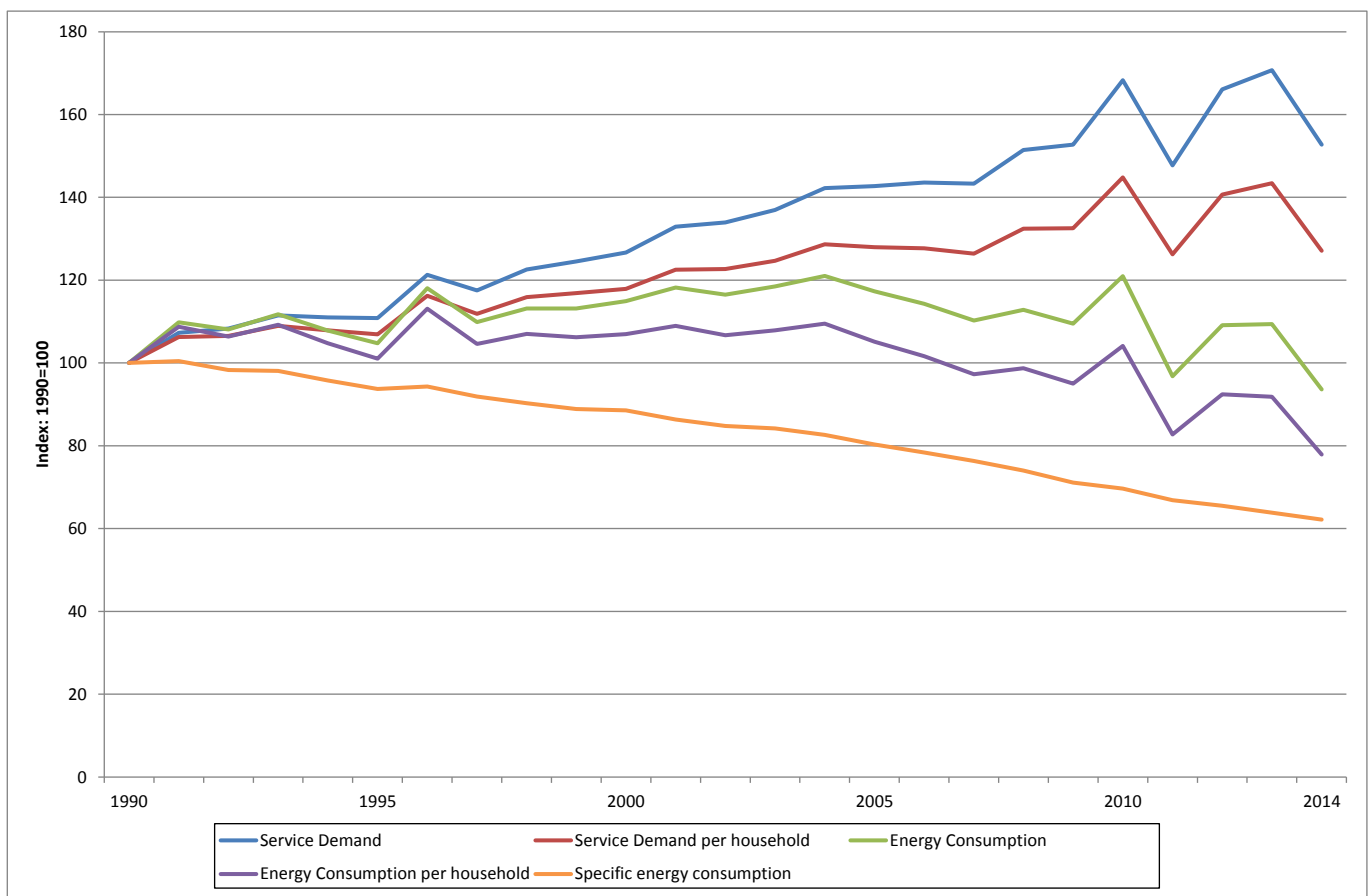
Source: Market Transformation Programme

7. Factors affecting domestic energy consumption between 1990 and 2014

Energy service demand reflects changes in the level of comfort and lifestyle requirements of households. Specific energy consumption is defined as the energy required to maintain a particular level of energy service in households. It is a modelled alternative to energy intensity, and takes account of changes in demand for individual energy services (such as level of household comfort or hot water use), and helps to remove the impact of higher and lower external temperatures on energy use.

Chart 8 shows that there has been a steady reduction in specific energy consumption, i.e. an improvement in domestic energy efficiency, since 1990 of an average of 2.0 per cent per year.

Chart 8 Specific energy consumption for households, UK (1990 to 2014)



Source: DECC, ECUK Table 3.36

Annex A Publication timetable for ECUK Chapter 3 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. In addition, tables that contain data directly available from other sources will not be updated. These tables will be clearly marked and web links to the published material will be provided. Also, where underlying information from the calculations is considered not to reflect the current situation tables will not be updated until more robust information becomes available.

The table below illustrates when each table for this chapter will be published, and if it is not going to be updated, alternate links to the data are provided.

Publication timetable for ECUK Chapter 3 tables in 2015

Table number in publication (2015)	Table Name	Link provided to another publication:	To be published:
3.01	Domestic energy consumption by fuel in terms of primary energy equivalents, 1970 to 2014	-	July
3.02	Domestic energy consumption by end use and fuel in primary energy equivalents, 1990 to 2013	-	To be confirmed
3.03	Domestic energy consumption by fuel, 1970 to 2014	-	July
3.04	Domestic energy consumption by end use, 1970 to 2013	-	To be confirmed
3.05	Domestic energy consumption by end use and fuel, 1990 to 2013	-	To be confirmed
3.06	Internal and external temperatures, 1970 to 2013	-	To be confirmed
3.07	Average domestic gas and electricity UK, 2008 to 2014	-	July
3.08	Overall drivers of energy consumption, 1970 to 2013	-	To be confirmed
3.09	Standard Assessment Procedure (SAP) ratings, 1970 to 2013	-	July
3.10	Total electricity consumption by household domestic appliances, 1970 to 2014	-	July
3.11	Household average daily electrical use, 2010-11	-	<i>Not updated</i>
3.12	Number of appliances owned by households in the UK, 1970 to 2014	-	July
3.13	Total stock by energy rating in the UK, 1996 to 2014	-	July
3.14	Percentage of households owning household domestic appliances, 1970 to 2013	-	July
3.15	Energy consumption of new appliances, 1990 to 2014	-	July
3.16	Installed central heating by type in UK, 1970 to 2012	-	To be confirmed
3.17	Boiler types by tenure in UK, 1975 to 2012	-	To be confirmed
3.18	Boiler types by tenure in the UK, 2008 to 2012	-	To be confirmed
3.19	Ownership of loft insulation in the UK, 1976 to 2015	-	July
3.20	Ownership of cavity wall insulation in the UK, 1976 to 2015	-	July

Table number in publication (2015)	Table Name	Link provided to another publication:	To be published:
3.21	Installed double glazing in UK, 1976-2012	-	To be confirmed
3.22	Installed hot water tank insulation in UK, 1976-2012	-	To be confirmed
3.23	Ownership of solid wall insulation in the UK, 2008 to 2015	-	July
3.24	Number of measures installed and energy savings in the Energy Efficiency Commitment (EEC)/Carbon Emissions Reduction Target (CERT)	https://www.ofgem.gov.uk/ofgem-publications/58682/finalcertupdate19300413.pdf (May update)	Not updated
3.25	Number of measures delivered by suppliers in the CERT programme	https://www.ofgem.gov.uk/ofgem-publications/58682/finalcertupdate19300413.pdf (May update)	Not updated
3.26	Mean and median electricity and gas consumption by dwelling type, England 2005 to 2011	https://www.gov.uk/government/collections/national-energy-efficiency-data-need-framework	Not updated
3.27	Mean and median electricity and gas consumption by property age, England 2005 to 2011	https://www.gov.uk/government/collections/national-energy-efficiency-data-need-framework	Not updated
3.28	Mean and median electricity and gas consumption by floor area (metres squared), England 2005 to 2011	https://www.gov.uk/government/collections/national-energy-efficiency-data-need-framework	Not updated
3.29	Mean and median electricity and gas consumption by number of bedrooms, England 2005 to 2011	https://www.gov.uk/government/collections/national-energy-efficiency-data-need-framework	Not updated
3.30	Mean and median electricity and gas consumption by tenure, England 2005 to 2011	https://www.gov.uk/government/collections/national-energy-efficiency-data-need-framework	Not updated
3.31	Mean and median electricity and gas consumption by household income, England 2005 to 2011	https://www.gov.uk/government/collections/national-energy-efficiency-data-need-framework	Not updated
3.32	Mean and median electricity and gas consumption by number of adults, England 2005 to 2011	https://www.gov.uk/government/collections/national-energy-efficiency-data-need-framework	Not updated
3.33	Housing Characteristics: Heat Loss Parameter	-	To be confirmed
3.34	Housing Characteristics: Boiler Efficiency	-	To be confirmed
3.35	Domestic energy intensity, 1970 to 2014	-	July
3.36	Specific energy consumption for households, 1990 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

- **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, 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.

- **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 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.

© Crown copyright 2015
Department of Energy & Climate Change
3 Whitehall Place
London SW1A 2AW
www.gov.uk/decc

URN: 15D/377