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Energy Consumption in the UK (2013)

Chapter 3
Domestic energy consumption in the UK between 1970 and 2012

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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 25 July 2013: 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 2012;
- Domestic sector energy consumption by **fuel type** between 1970 and 2012;
- Domestic sector energy consumption by **end use** between 1970 and 2012;
- Average domestic gas and electricity consumption between 2008 and 2012;
- Domestic sector energy consumption **per head and by income** between 1970 and 2012;
- Use of electricity by **appliance type** between 1970 and 2012;
- **Energy efficiency improvements** in appliances between 1990 and 2012; and
- **Factors** affecting domestic energy consumption.

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.

Overall domestic sector energy consumption in 2012

In 2012, energy consumption from the domestic sector (excluding transport use) was 43,153 thousand tonnes of oil equivalent (ktoe), 11 per cent higher than consumption in 2011 (38,893 ktoe). Temperature is a key driver of domestic energy use. The growth witnessed in 2012 was mainly driven by colder weather than seen in 2011, with average air temperature being 1 degree Celsius lower. This compares with the fall in consumption seen in 2011 which was much warmer than 2010. Analysis has been included in this factsheet (page 4) which applies a temperature

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correction factor to derive average gas and electricity consumption values for households under "normal" temperature conditions.

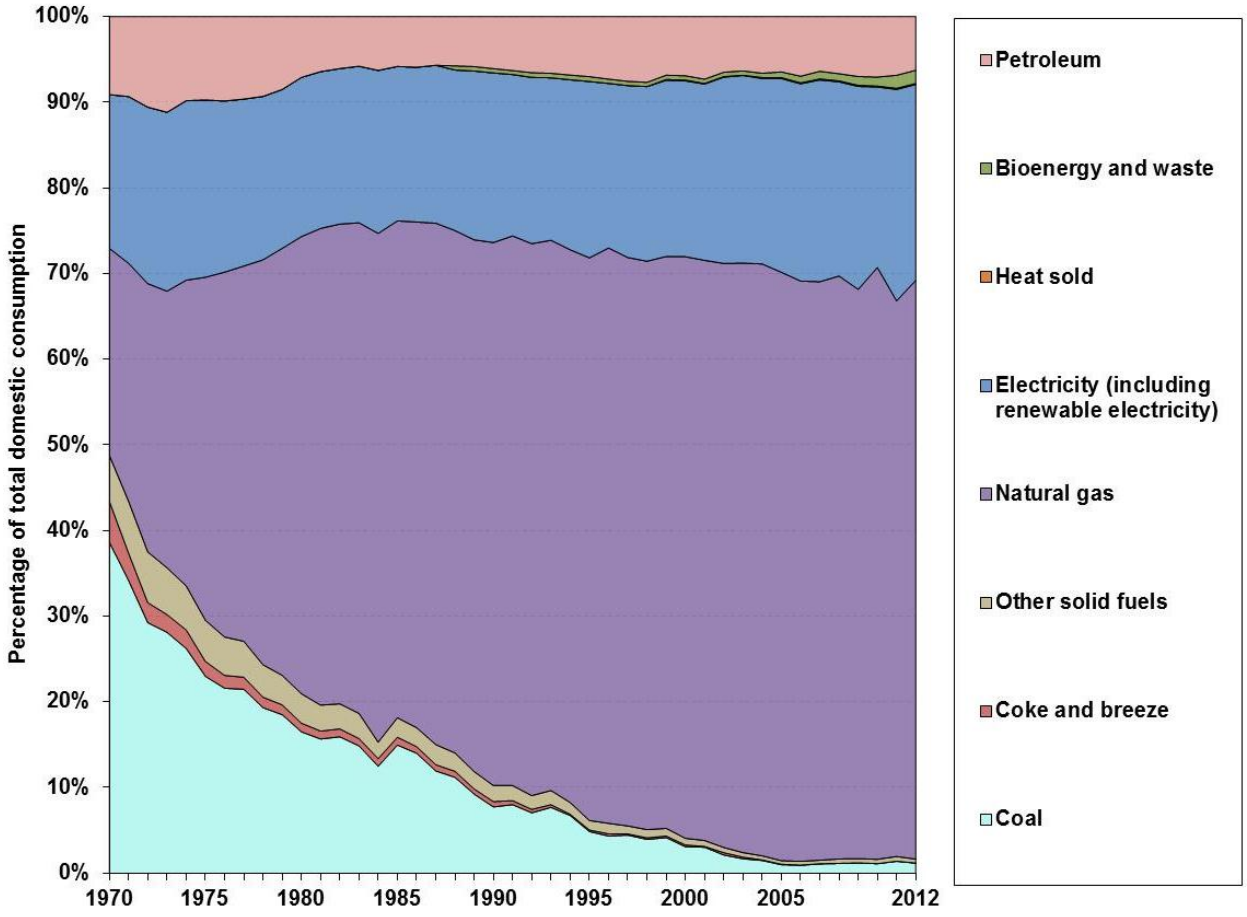
Since 1990 domestic energy use has increased by 6 per cent, whilst there has been an increase of 20 per cent in the number of UK households and a 12 per cent increase in the UK population. At a per household level, energy consumption has fallen by 12 per cent since 1990.

In 2012 domestic consumption was 29 per cent of total UK final consumption of energy products.

Domestic sector energy consumption by fuel type between 1970 and 2012

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 8 per cent coal, 63 per cent gas and 20 per cent electricity in 1990; and to 1 per cent coal, 68 per cent natural gas and 23 per cent electricity in 2012 as shown in Chart 1.

Chart 1 **Domestic consumption by fuel, UK (1970 to 2012)**



Source: DECC, ECUK Table 3.03

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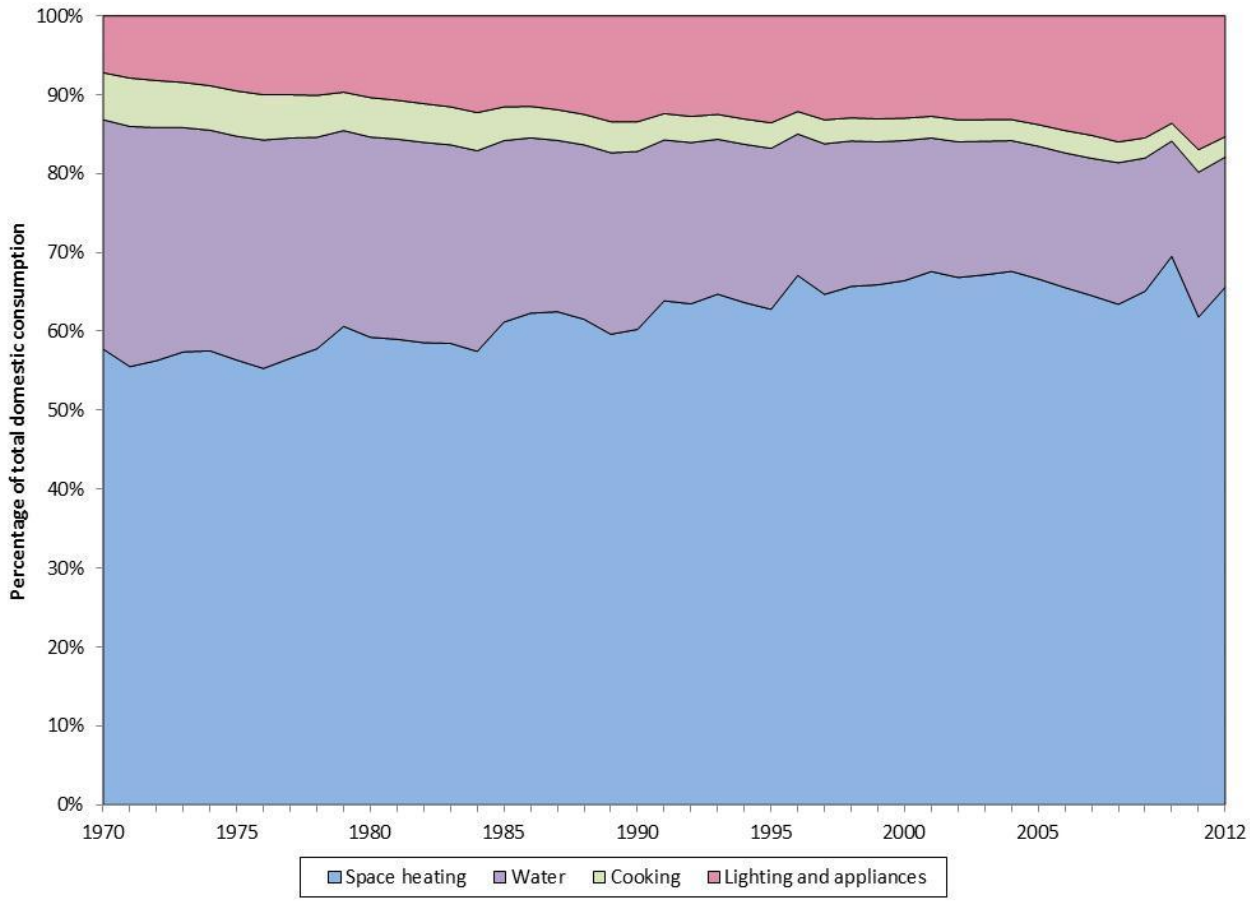
Domestic sector energy consumption by end use between 1970 and 2012

The majority of energy consumed in the domestic sector is for space heating which in 2012 represented 66 per cent of total domestic consumption. Water heating and lighting and appliances accounted for a further 17 and 15 per cent respectively with cooking accounting for a further 3 per cent.

Since 1970, there has been a continued fall in the proportion of energy used for water heating and cooking, and a continued rise in the proportion used for lighting and appliances. Space heating remained the primary use of energy in the home over the whole period. Compared to 2011, the amount of energy used for water heating, cooking and lighting and appliances has remained stable in 2012, with the only increase occurring in the amount of energy used for space heating. This increase in the amount used for space heating can be attributed to milder weather conditions in 2011 returning to more typical weather conditions in 2012.

Chart 2 **Domestic final energy consumption by end use, UK (1970 to 2012)**



Source: DECC, ECUK Table 3.04

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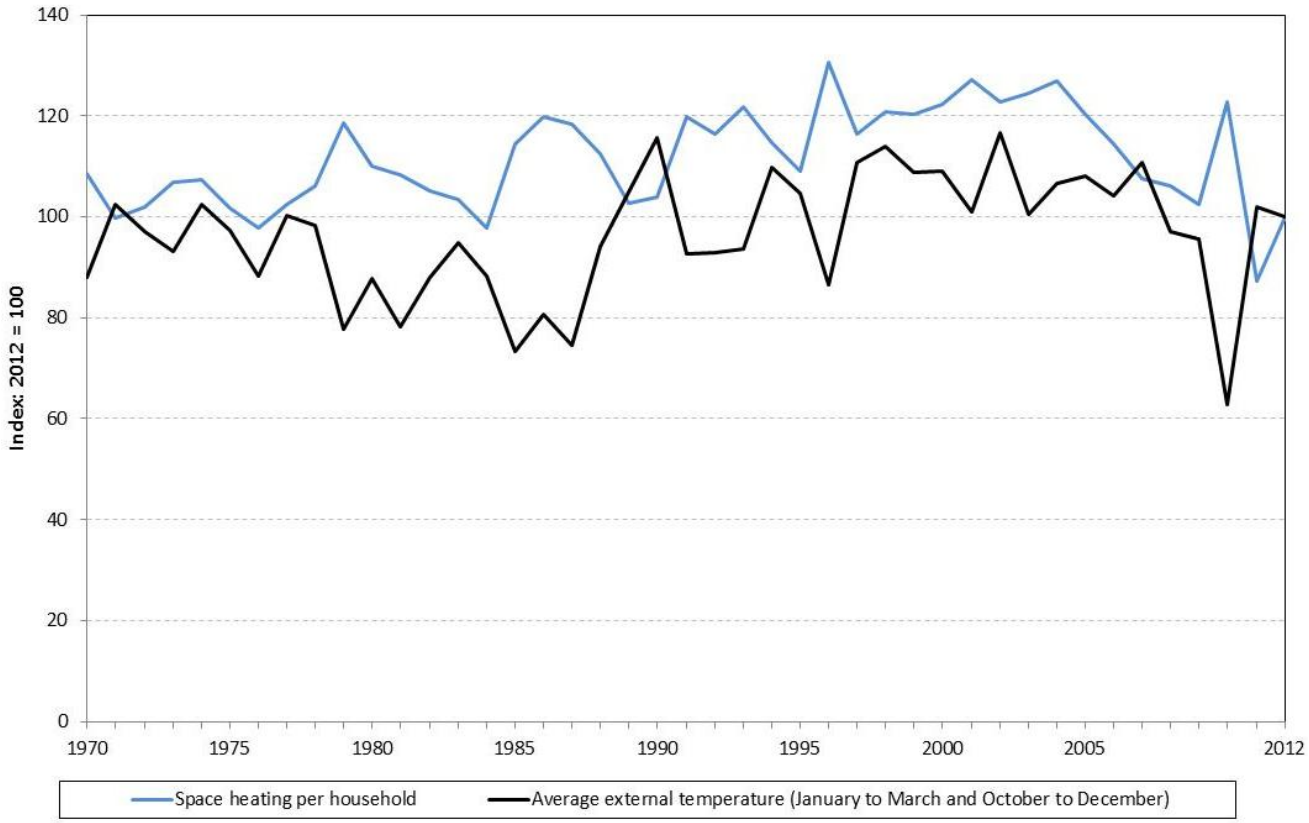
Chart 3 displays the inverse relationship between energy used per household for space heating and external temperature during the main heating season (January to March and October to December). Both series are indexed to 2012=100; the peaks and troughs in 1996 and 2010 clearly indicate the impact of low winter temperatures on household energy use.

Chart 3 **Space heating consumption per household and heating season outside temperatures, UK (1970 to 2012)**



Source: DECC, ECUK Tables 3.04, 3.06 and 3.08

Average domestic gas and electricity consumption between 2008 and 2012

Chart 4 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 play a bigger part on domestic gas consumption.

The average unadjusted electricity consumption per household in 2012 was 4,227 kilowatt hours (kWh). This adjusts very slightly to 4,226 kWh once a temperature factor has been applied to the data. Average unadjusted gas consumption per customer in 2012 was 15,281 kWh; this adjusts to

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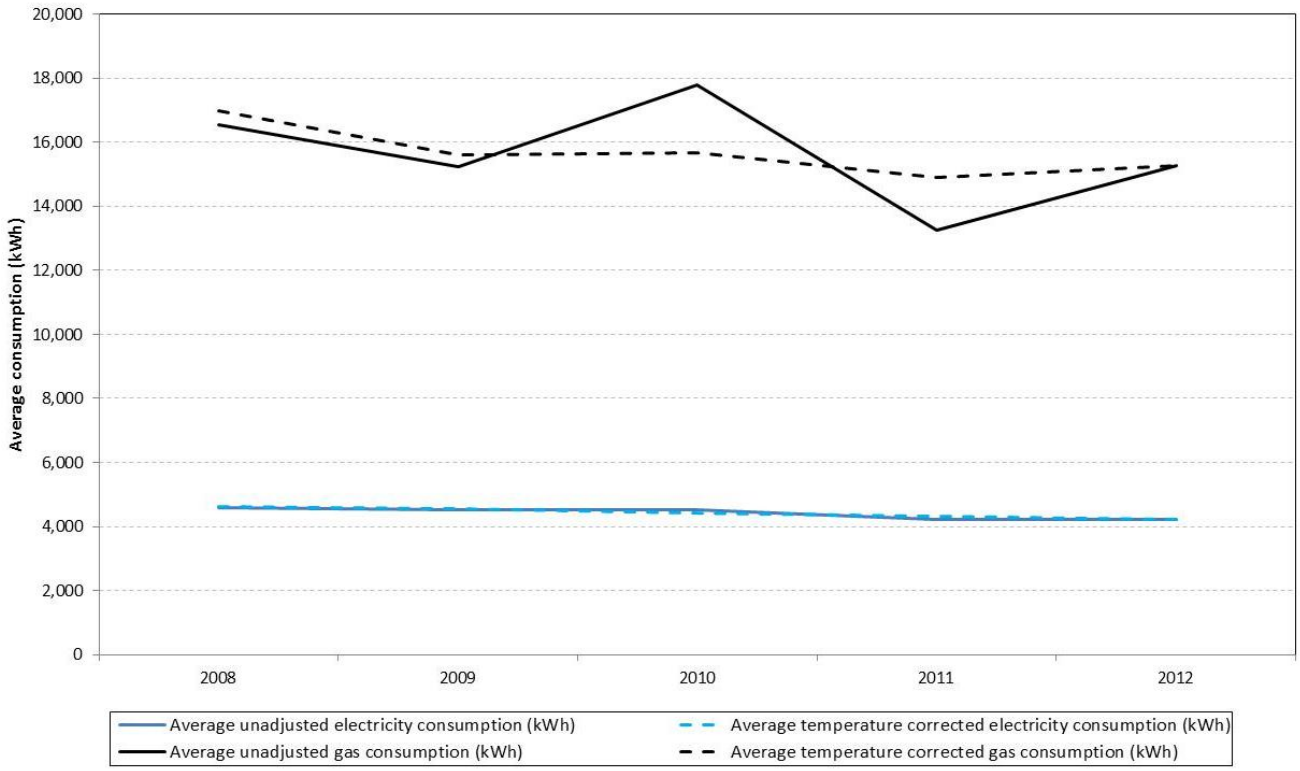
15,257 kWh once a temperature factor has been applied to the data. However in 2011 observed gas consumption was 13,252 kWh, but adjusted for the warmer weather, it was 14,914 kWh.

Chart 4 **Average domestic (unadjusted and temperature corrected) gas and electricity consumption, UK (2008 to 2012)**



Source: DECC, ECUK Tables 3.07

Domestic sector energy consumption per head and by income between 1970 and 2012

Factors affecting domestic energy consumption include the number 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 5 below.

Energy consumption per unit of household disposable income has fallen by 35 per cent since 1990, whilst energy consumption per household has fallen by 12 per cent and energy consumption per person fallen by 5 per cent.

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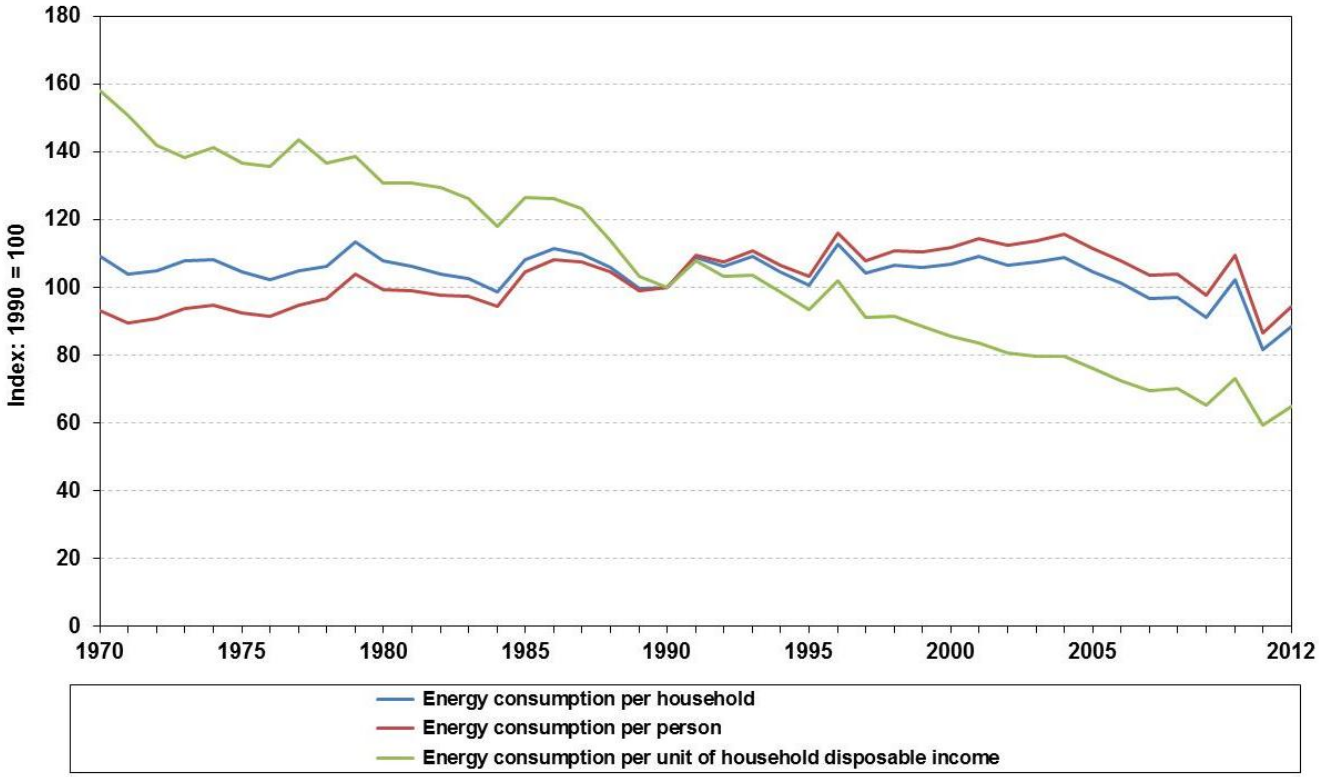
Chart 5 **Domestic energy consumption per person, per household and per unit of household income, UK (1970 to 2012)**



Source: DECC, ECUK Table 3.35

Use of electricity by appliance type between 1970 and 2012

The total amount of electricity consumption by household domestic appliances between 1970 and 2012 grew by around 1.7 per cent per year over this period. Chart 6 shows that in 2012, consumer electronics were the largest consuming domestic appliances group with an estimated consumption of 1,868 ktoe, followed by wet appliances with an estimated consumption of 1,296 ktoe and lighting with an estimated consumption of 1,181 ktoe.

Between 1970 and 2012, electricity consumption from consumer electronics increased by 376 per cent, wet appliances by 151 per cent and cold appliances by 96 per cent. Home computing, which had no recorded energy use in 1970, rose to 587 ktoe in 2012. Since 1990 electricity consumption from consumer electronics increased by 77 per cent and wet appliances by 26 per cent, whilst electricity consumption from lighting appliances and cold appliances fell by 14 per cent and 21 per cent respectively, reflecting improved efficiency. Home computing rose by 409 per cent between 1990 and 2012.

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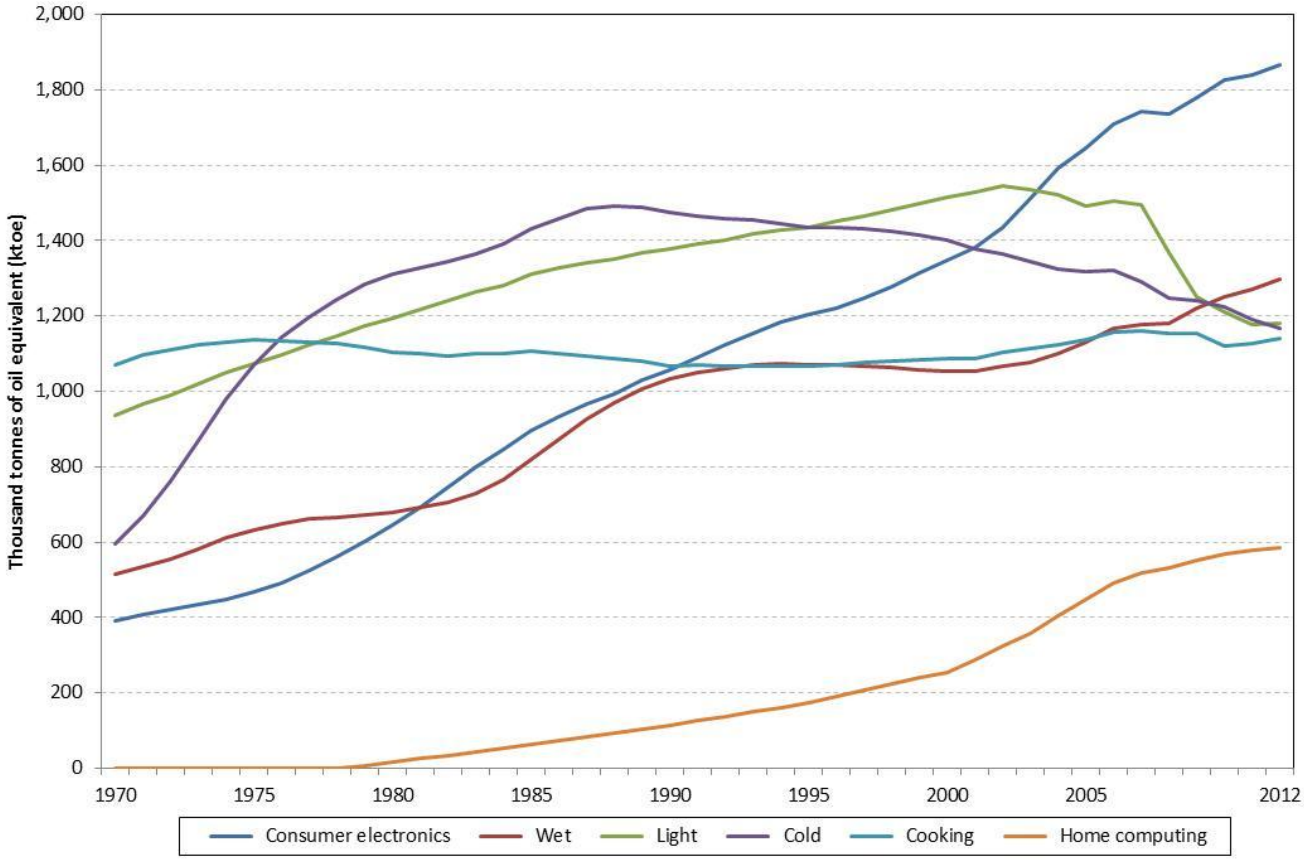
Chart 6 **Electricity consumption by household domestic appliance, by broad type, UK (1970 to 2012)**



Source: DECC, ECUK Table 3.10

Energy efficiency improvements in appliances between 1990 and 2012

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 7) improved most for chest freezers which consumed 66 per cent less electricity in 2012 than in 1990. Over the same period energy consumption for new upright freezers fell by 59 per cent and for new refrigerators by 55 per cent. For wet appliances (Chart 8), efficiency improvements have been greatest in new dishwashers which demonstrated a 39 per cent improvement, and washing machines with a 32 per cent improvement.

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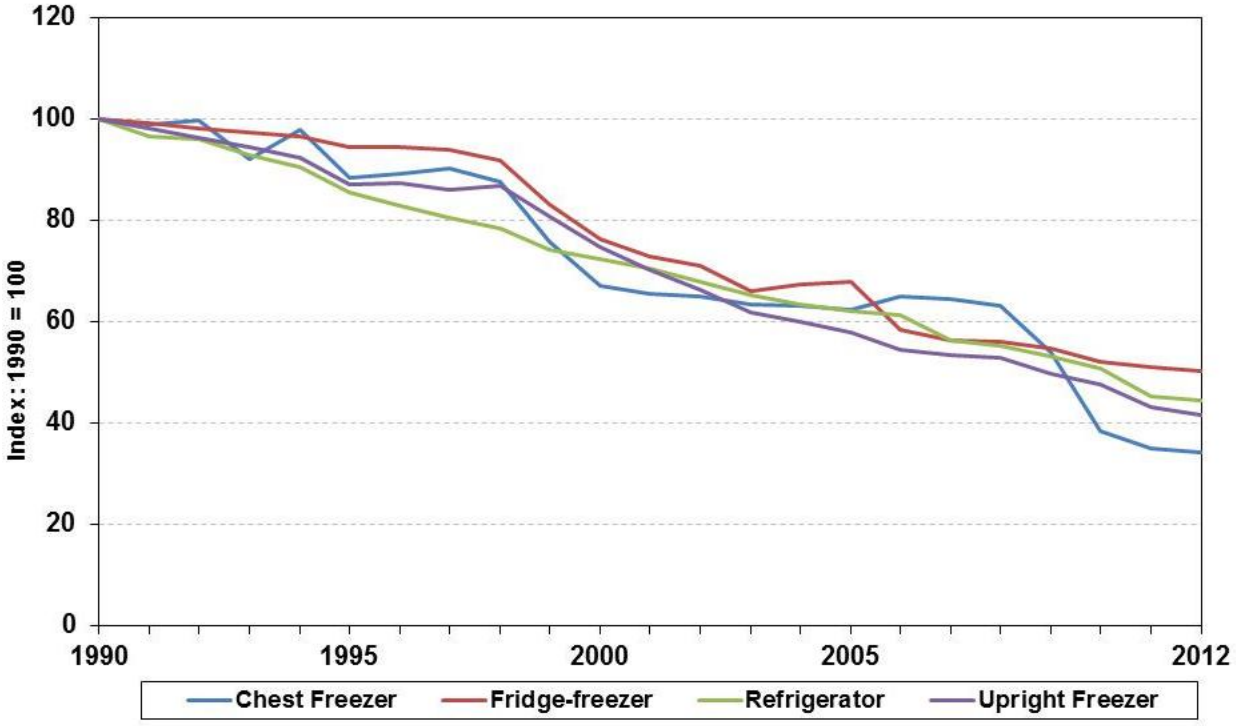
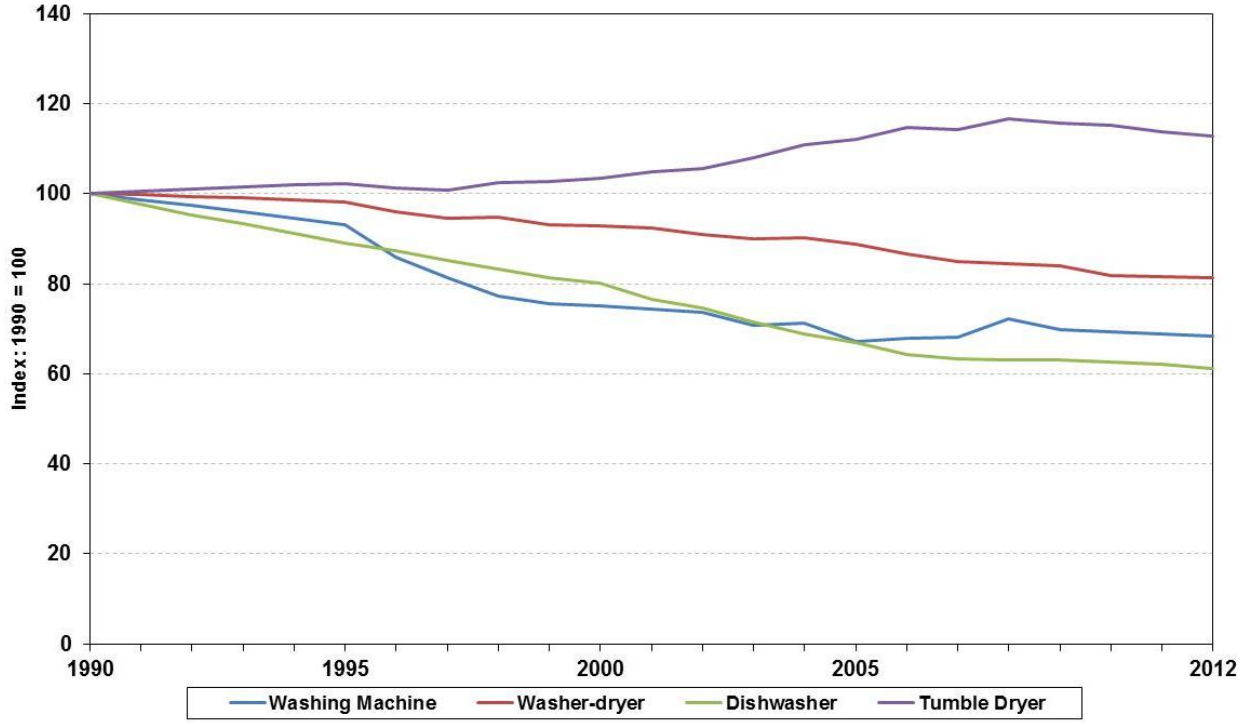
Chart 7 **Average energy consumption of new cold appliances, UK (1990 to 2012)**



Source: DECC, ECUK Table 3.15

Chart 8 **Average energy consumption of new wet appliances, UK (1990 to 2012)**



Source: DECC, ECUK Table 3.15

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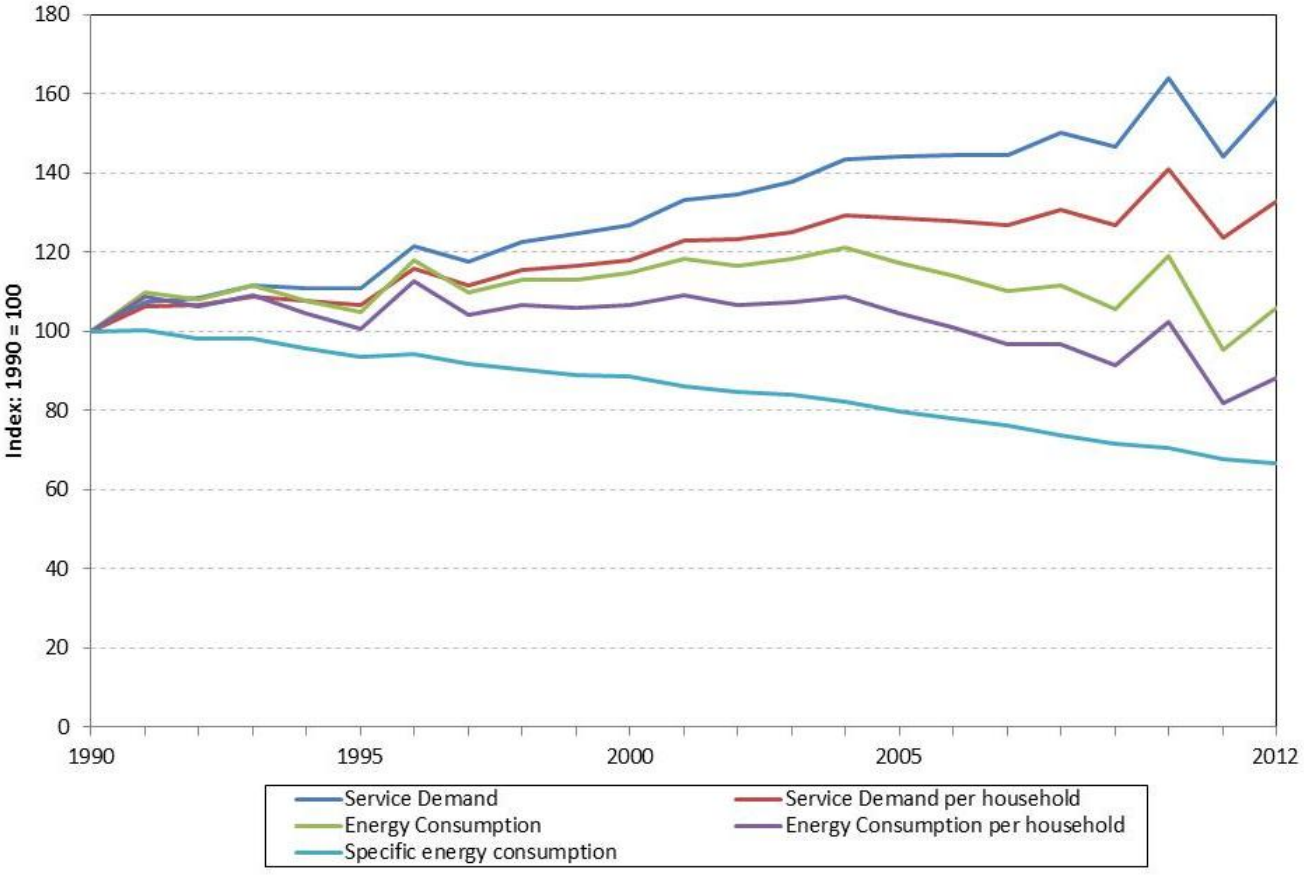
Factors affecting domestic energy consumption

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 high and lower temperatures on energy use.

Chart 9 shows that there has been a steady reduction in specific energy consumption, i.e. an improvement in domestic energy efficiency, since 1990.

Chart 9 **Specific energy consumption for households, UK (1990 to 2012)**



Source: DECC, ECUK Table 3.36

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New tables included in Chapter 3 of the 2013 edition of ECUK

The following tables are new additions to this chapter of ECUK:

- Table 3.07: Average domestic gas and electricity consumption.
- Table 3.11: Household Average Daily Electrical Use.
- Table 3.30: Mean and median electricity and gas consumption by tenure, England 2005 to 2011.
- Table 3.31: Mean and median electricity and gas consumption by household income, England 2005 to 2011.
- Table 3.32: Mean and median electricity and gas consumption by number of adults, England 2005 to 2011.
- Table 3.33: Housing Characteristics: Heat Loss Parameter.
- Table 3.34: Housing Characteristics: Boiler Efficiency.

Further details about these tables have been provided in the User Guide.