



Department for  
Business, Energy  
& Industrial Strategy



# UK ENERGY IN BRIEF 2018



July 2018

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This publication is available for download at [www.gov.uk/government/collections/uk-energy-in-brief#2018](http://www.gov.uk/government/collections/uk-energy-in-brief#2018).

# UK ENERGY IN BRIEF 2018

This booklet summarises the latest statistics on energy production, consumption, prices and climate change in the United Kingdom. Figures are primarily taken from the 2018 edition of the “Digest of UK Energy Statistics”, published on 26 July 2018. Details of the Digest and other Department for Business, Energy and Industrial Strategy (BEIS) statistical publications on energy and climate change can be found on pages 46 and 47 of this booklet and are available at:

[www.gov.uk/government/organisations/department-for-business-energy-and-industrial-strategy/about/statistics](http://www.gov.uk/government/organisations/department-for-business-energy-and-industrial-strategy/about/statistics)

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## INTRODUCTION TO THE CHARTS AND TABLES

UK Energy in Brief aims to provide a summary of some of the key developments in the UK energy system: how energy is produced and used and the way in which energy use influences greenhouse gas emissions. It takes data from the main Department for Business, Energy and Industrial Strategy (BEIS) energy and climate change statistical publications, the Digest of UK Energy Statistics, Energy Trends, Energy Prices, Energy Consumption in the UK, the annual Fuel Poverty statistics report and statistical releases on emissions, and combines these with data produced by the Office for National Statistics and other Government Departments.

The booklet contains separate sections on the economics of the energy industry, overall energy production and consumption and trends in production and consumption of the major fuel sources, climate change and fuel poverty. Also discussed are developments in combined heat and power, renewable energy and feed in tariffs. Information is also given on energy efficiency, energy prices and energy expenditure.

The detailed background data on energy production and consumption can be found in the Digest of UK Energy Statistics 2018 available at:

[www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes](http://www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes)

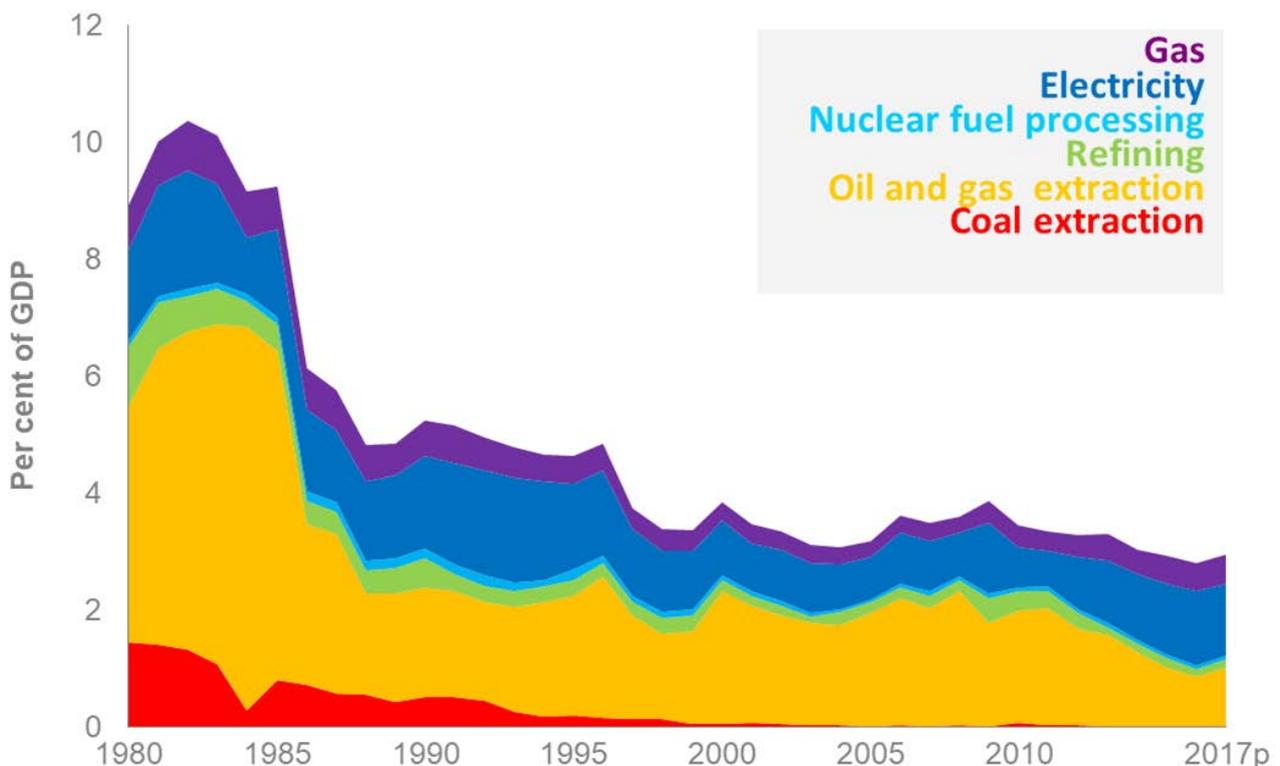
Other statistical outputs produced by BEIS and drawn on in this publication are listed on pages 46 and 47.

## ENERGY IN THE ECONOMY

### THE ENERGY INDUSTRIES' CONTRIBUTION TO THE UK ECONOMY IN 2017

- 2.9% of GDP.
- 9.8% of total investment.
- 33.6% of industrial investment.
- 1.9% of annual business expenditure on research and development in 2016.
- 181,000 people directly employed (6.3% of industrial employment) and more indirectly (e.g. an estimated 142,000 in support of UK Continental Shelf production).

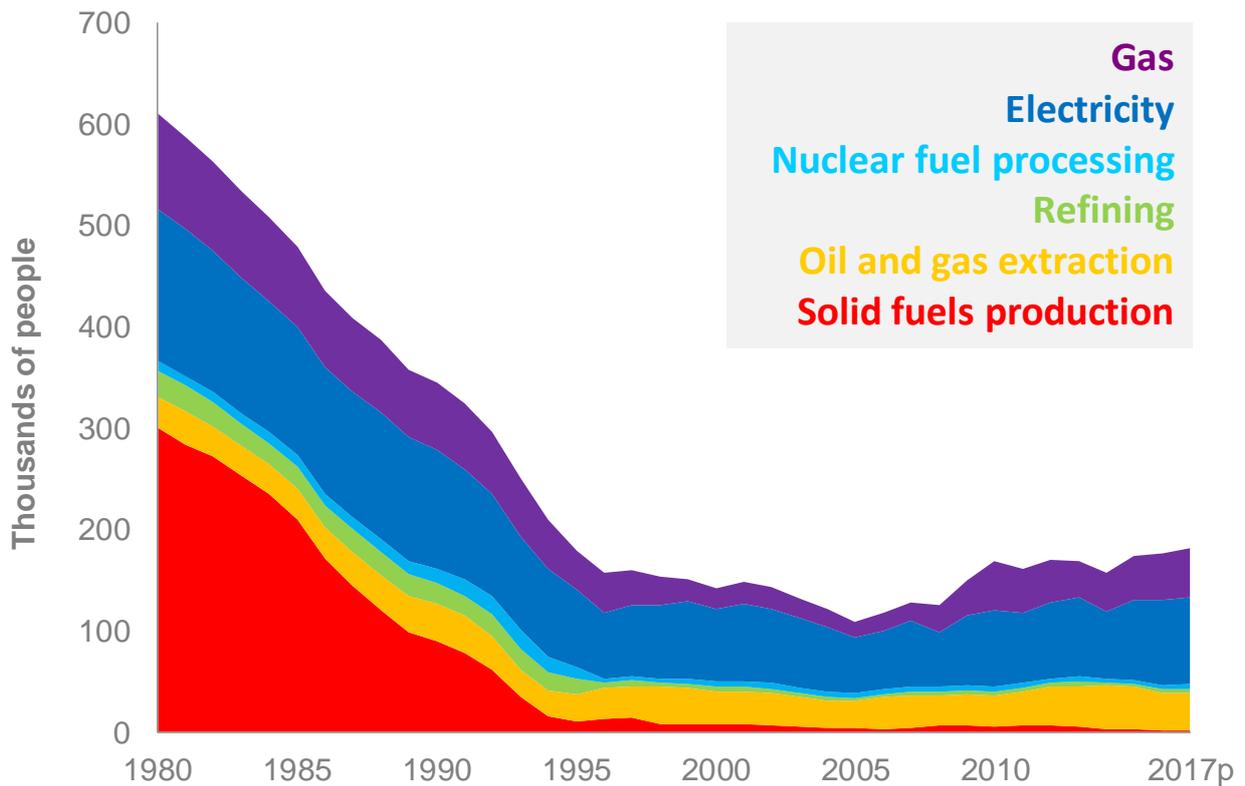
### Contribution to GDP by the energy industries, 1980 to 2017



Source: Office for National Statistics

The contribution to the UK economy by the energy industries peaked in 1982 at 10.4%. Despite its significant fall in 1986, oil and gas extraction has been the major energy contributor to the UK economy (with its value dependent both on production and the price of oil and gas). However, in 2015 and 2016 though oil production increased, the large fall in oil prices led to the contribution from the oil and gas sector falling below that of the electricity sector. However, in 2017 oil production fell and though oil prices increased, the oil and gas sector remained the second largest energy contributor. For 2017, the contribution by the energy industries to the UK economy was 2.9% of GDP (0.1 percentage points higher than in the previous year). Of the energy total in 2017 oil and gas extraction accounted for 29% (up 3.4 percentage point on the previous year), electricity (including renewables) accounted for 42% (down 2.9 percentage points) and gas accounted for 17% (down 0.7 percentage points).

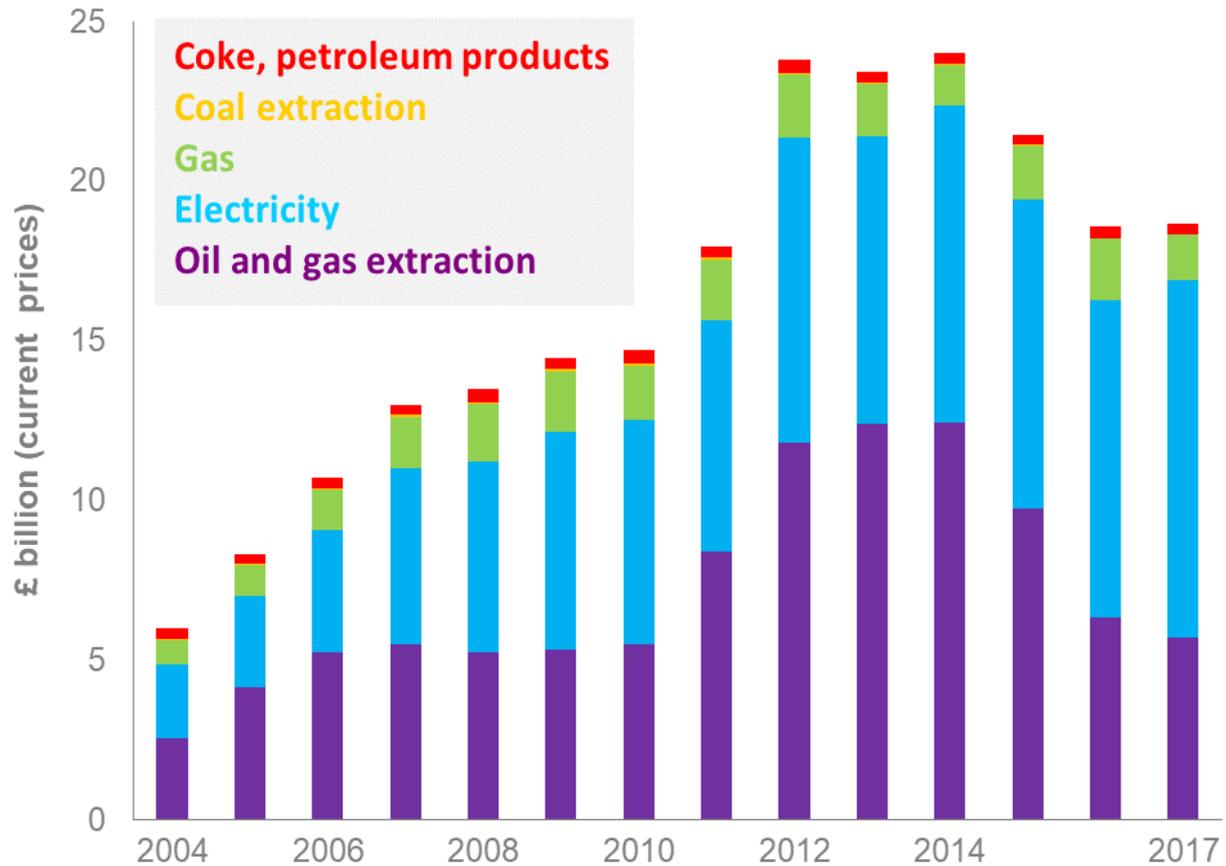
## Trends in employment in the energy industries, 1980 to 2017



Source: Office for National Statistics (Data from 1996 onwards based on SIC 2007 classifications)

Employment in the energy production and supply industries fell rapidly throughout the 1980s and mid-1990s largely as a result of closures of coal mines. Between 1995 and mid-2000s employment declined more slowly but since 2006 it has increased gradually, driven by growth in the electricity and gas sectors. In 2017 employment in the energy industries rose by 2.8% to 181,000 (66% above the 2005 level) and accounted for 6.3% of all industrial employment.

## Investment in the energy industries, 2004 to 2017

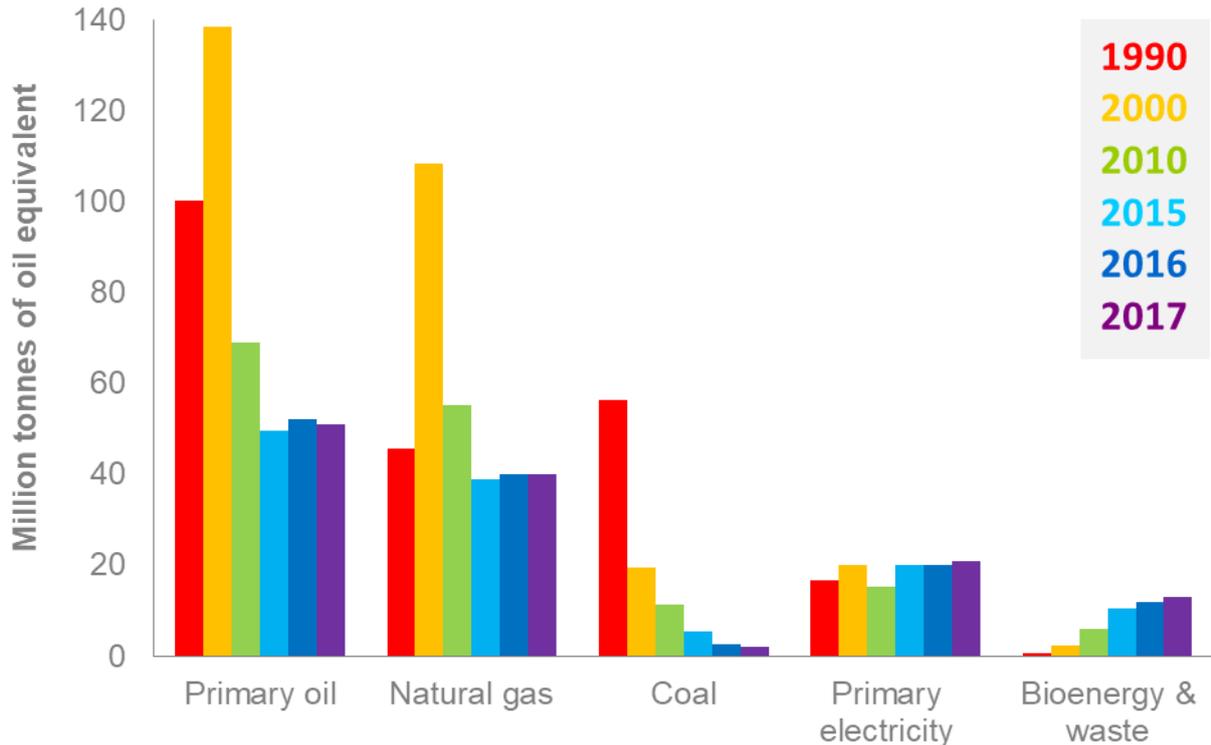


Source: Office for National Statistics

Since 2004 there has been increased investment in the energy industries, more specifically in the electricity sector, despite falls in recent years to below the 2014 level. In 2017 at £18.7 billion (at current prices) investment was 0.6% higher on the previous year and of that total 30% was in oil and gas extraction, 60% in electricity, 7.5% in gas, with the remaining in coal extraction, and coke & refined petroleum products industries.

## OVERALL ENERGY

### Production of primary fuels, 1990 to 2017



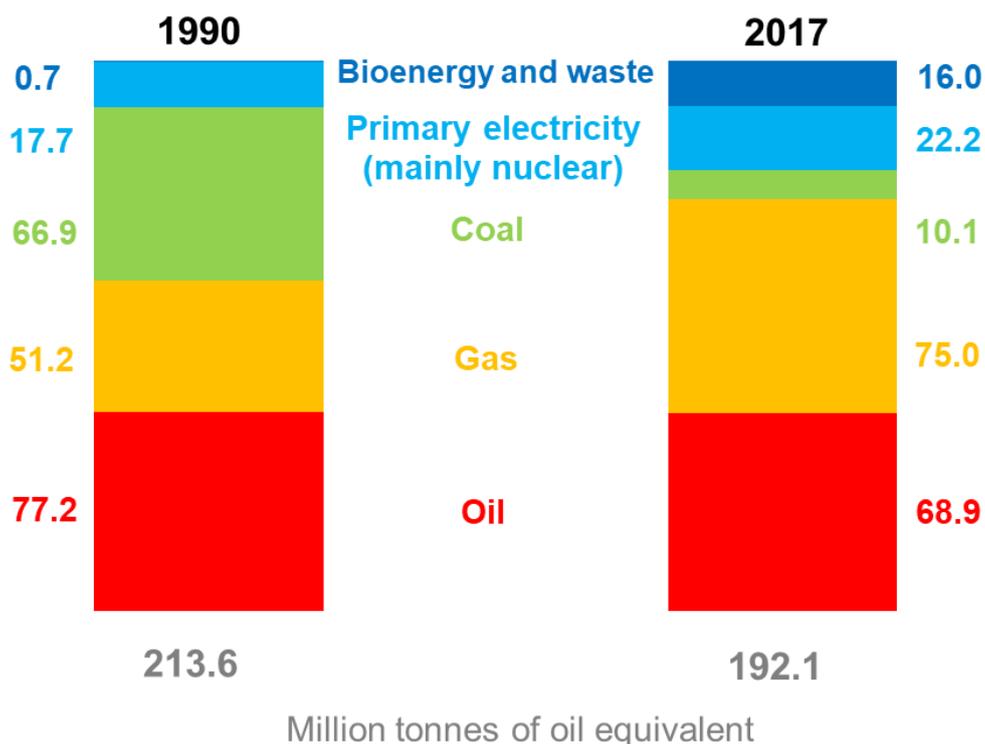
	Million tonnes of oil equivalent					
	1990	2000	2010	2015	2016	2017
Primary oil	100.1	138.3	69.0	49.5	52.0	50.9
Natural gas	45.5	108.4	55.3	38.8	39.9	40.0
Coal	56.4	19.6	11.4	5.4	2.6	1.9
Primary electricity	16.7	20.2	15.1	20.1	20.0	20.9
Bioenergy & waste	0.7	2.3	6.1	10.3	11.8	12.9
<b>Total</b>	<b>219.4</b>	<b>288.7</b>	<b>156.9</b>	<b>124.5</b>	<b>126.3</b>	<b>126.7</b>

Total production of primary fuels, when expressed in terms of their energy content, rose by 0.4% in 2017 compared to 2016. The rise was due to an increase in primary electricity from wind, solar and hydro production, mainly due to increased wind and solar capacity. There was also growth from gas and bioenergy and waste. However, oil and nuclear production both decreased. Coal production fell to a record low level in 2017. Primary oil (crude oil and Natural Gas Liquids) accounted for 40% of total production, natural gas 32%, primary electricity (consisting of nuclear, wind, solar and natural flow hydro) 17%, bioenergy and waste 10%, while coal accounted for the remaining 2%.

Total production increased rapidly between 1980 and 2000, mainly due to the growth of oil and gas. Production in 2000 was at record levels for natural gas, whilst in 1999 it was at record levels for overall energy and petroleum. Production has since been on a general decline as a number of oil and gas fields become exhausted and also due to increased maintenance activity. Production is now 57% lower than its peak in 1999. Since 2000, oil and gas production together have fallen by an average of 5.7% per year.

## OVERALL ENERGY

### Inland energy consumption, 1990 and 2017



	Million tonnes of oil equivalent				
	1990	2000	2010	2016	2017
<b>Total inland primary energy consumption<sup>1</sup>:</b>	213.6	234.8	219.5	194.5	192.1
<b>Conversion losses:</b>		53.8	50.3	37.4	35.8
<b>Distribution losses and energy industry use:</b>	66.4	20.7	18.0	15.0	15.0
<b>Total final energy consumption:</b>	147.3	159.4	150.5	142.2	141.2
<b>Final consumption of which:</b>					
<b>Industry</b>	38.7	35.5	27.0	23.7	24.1
<b>Domestic sector</b>	40.8	46.9	49.4	41.7	40.1
<b>Transport</b>	48.6	55.5	54.6	56.0	56.5
<b>Services<sup>2</sup></b>	19.2	21.5	19.4	20.8	20.5
<b>Temperature corrected total inland consumption:</b>	221.6	240.2	213.7	195.7	195.2

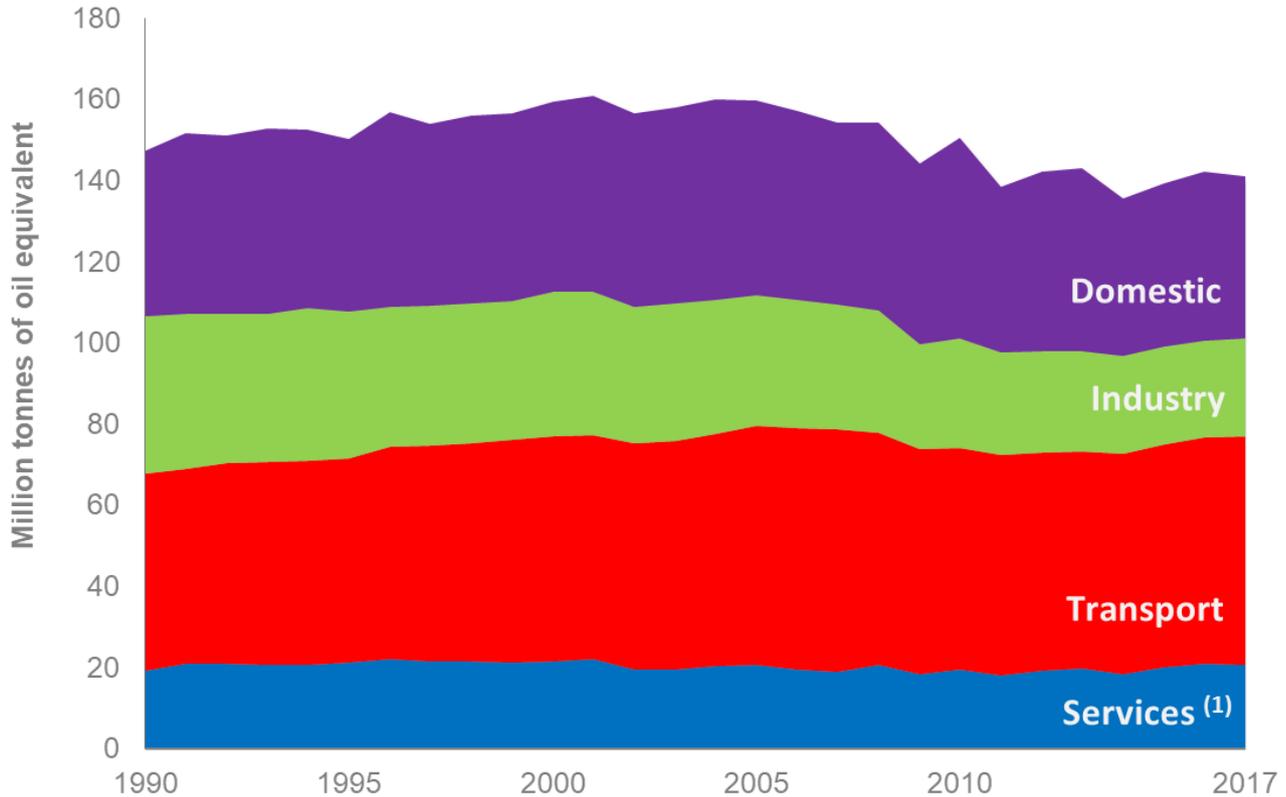
(1) Excludes non-energy use

(2) Includes agriculture

Primary energy consumption was 1.2% lower in 2017 than in 2016. The average temperature in 2017 was 0.3 degrees Celsius warmer than in 2016, though the summer months of July to September were cooler. On a temperature corrected basis, primary energy consumption was 0.3% lower than in 2016, continuing the general fall seen since 2005. In the last 30 years or so, consumption of natural gas and primary electricity has risen considerably, whilst consumption of oil and coal have fallen. However, over the past decade or so, consumption of bioenergy and waste has also grown.

## OVERALL ENERGY

### Final energy consumption, 1990 to 2017



**2017**

**Million tonnes of oil equivalent**

	Industry	Domestic	Transport	Services <sup>1</sup>	Total
Coal & manufactured fuels	1.3	0.6	0.0	0.0	1.9
Gas	8.7	25.5	-	8.0	42.2
Oil	4.3	2.5	55.1	2.0	63.9
Electricity	8.0	9.1	0.4	8.4	25.9
Bioenergy and heat	1.9	2.5	1.0	2.1	7.4
<b>Total</b>	<b>24.1</b>	<b>40.1</b>	<b>56.5</b>	<b>20.5</b>	<b>141.2</b>

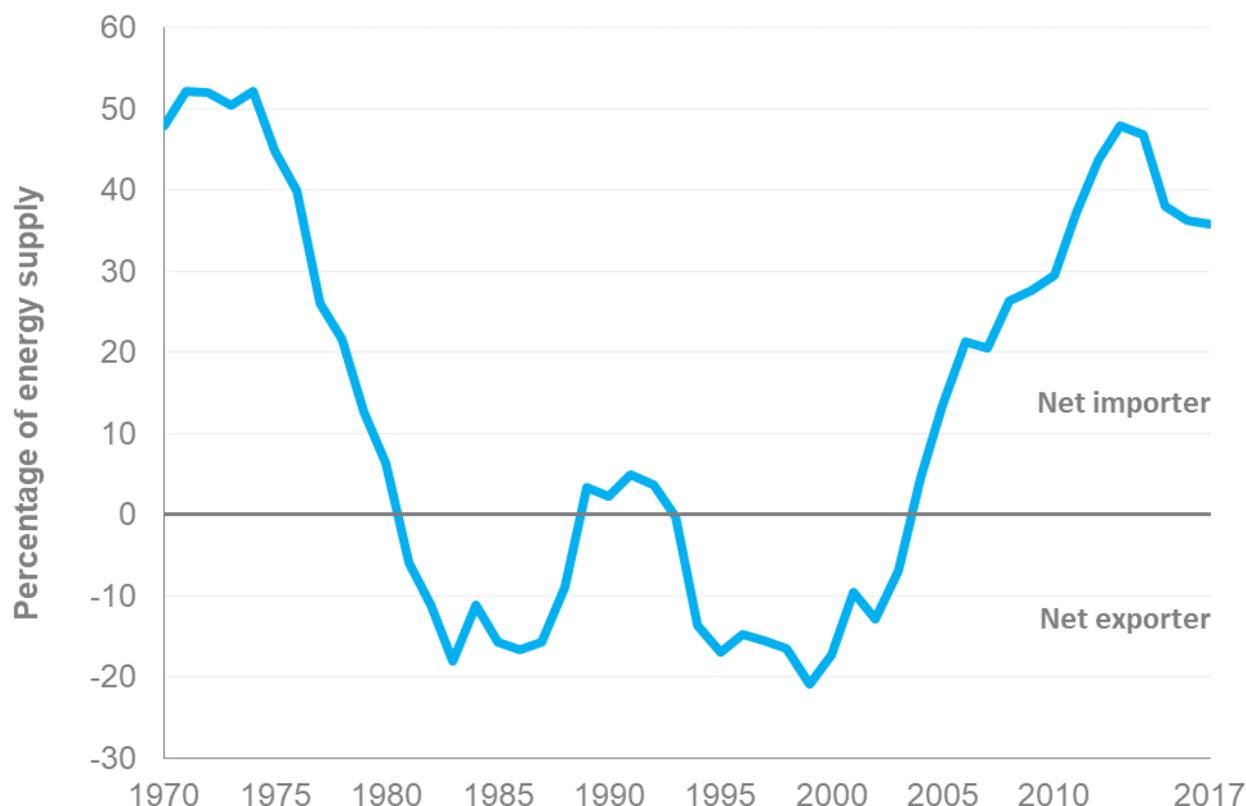
(1) Includes agriculture

Total final energy consumption (excluding non-energy use) was 0.7% lower in 2017 compared to 2016. It fell by 3.7% in the domestic sector, and by 1.4% in the service sector, but rose by 0.9% in the transport sector, and by 1.6% in the industry sector. The falls in the domestic and service sectors were due to reduced demand for heat reflecting the warmer winter period (October to December) in 2017. Overall final energy consumption, when adjusted for temperature, was up by 0.9%, in 2017.

In terms of fuel types, final consumption of gas, the main fuel used for heating, fell by 3%. Oil use rose by 1%, with a 1% increase in fuel used for transport. Electricity consumption fell by 1%, however there was increased use of bioenergy in all sectors except transport.

## OVERALL ENERGY

### Import dependency, 1970 to 2017



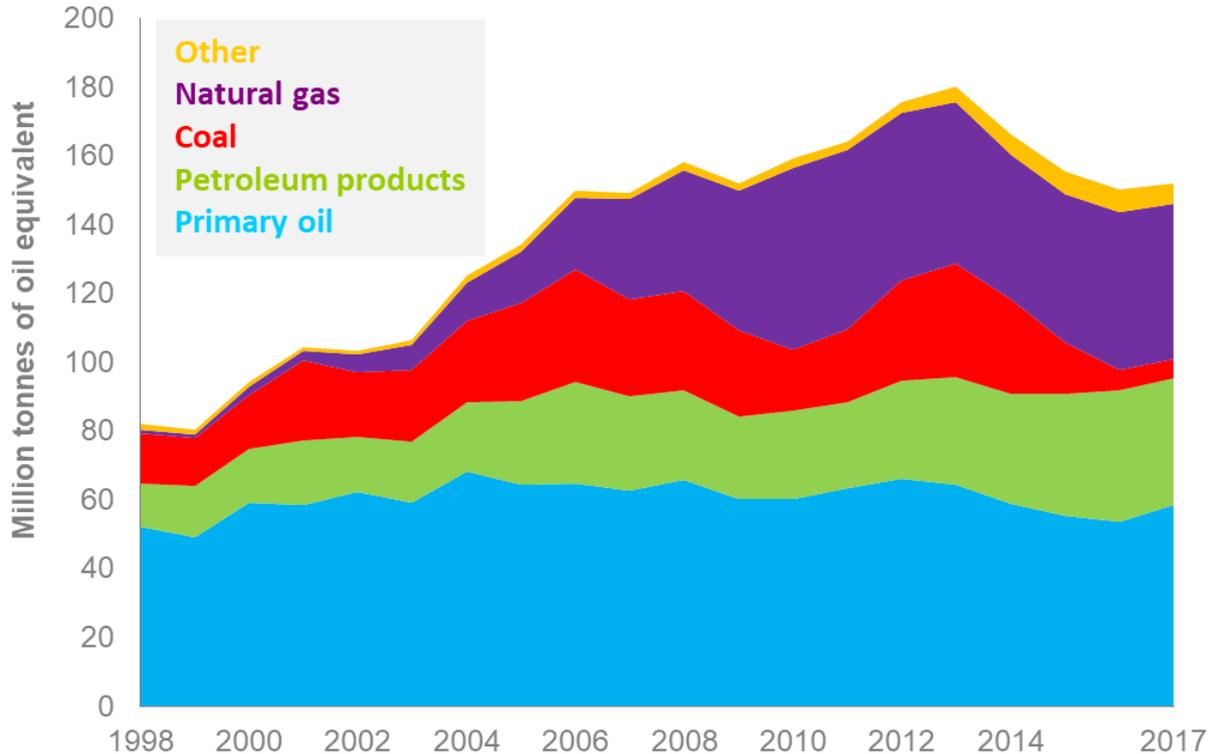
	<b>Percentage</b>					
	<b>2000</b>	<b>2010</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
Coal	39%	52%	87%	60%	47%	57%
Gas	-11%	40%	47%	43%	47%	46%
Oil	-55%	14%	43%	37%	34%	35%
<b>Total</b>	<b>-17%</b>	<b>29%</b>	<b>47%</b>	<b>38%</b>	<b>36%</b>	<b>36%</b>

In the 1970's the UK was a net importer of energy. Following development of oil and gas production in the North Sea, the UK became a net exporter of energy in 1981. Output fell back in the late 1980's following the Piper Alpha disaster, with the UK regaining a position as a net exporter in the mid 1990's. North Sea production peaked in 1999, and the UK returned to being an energy importer in 2004. In 2013 imports of petroleum products exceeded exports following the closure of the Coryton refinery; the UK is now a net importer of all main fuel types although remains a net exporter of some products such as petrol and fuel oil. In 2017, 36% of energy used in the UK was imported, down sharply from the 2014 level due to increases in indigenous oil and gas output and, more recently, renewables.

Latest comparable data from Eurostat, for 2016, show that the UK had the seventh lowest level of import dependency in the EU. All EU countries are now net importers of energy.

## OVERALL ENERGY

### Key sources of imports, 1998 to 2017



Since 1999, when UK energy production peaked, there has been a sharp rise in imports. Over this period imports doubled, although they have fallen back since 2013. In 2010 imports exceeded UK production, but because the UK still exports large volumes net imports still remain below production levels. By fuel type the largest growth in the past 10 years has come from gas imports, though there have been increases from most fuels.

In 2017 imports rose by 1%, with falls in imports of petroleum products and in gas, more than offset by the rise in imports of primary oil which were up by 9% to meet UK refinery demand, as OPEC production cuts made it cheaper for Asian refineries to use UK crude oil resulting in an increase of exports by 10%.

Imports are sourced from a wide variety of countries.

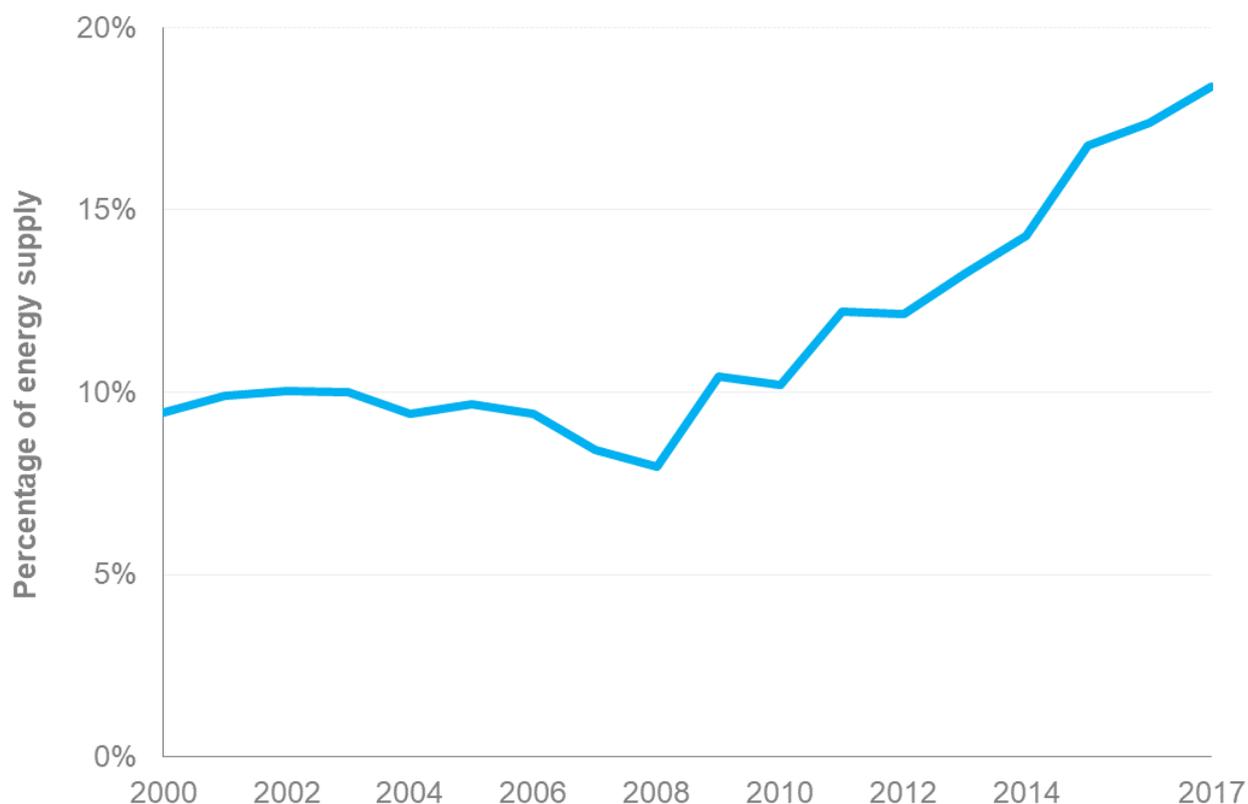
**Crude oil:** The key source of imports has historically been Norway – while Norway remained the primary source of crude in 2017, its share of UK imports fell from 62 to 48 per cent. Imports from OPEC countries increased by more than a quarter to contribute to the increase in total imports in 2017.

**Petroleum products:** The UK imports a wide variety of petroleum products, while remaining a net exporter of certain fuels including petrol. Traditionally the Netherlands, which acts as a major trading hub, has been the largest source of imports. As such, the Netherlands is the largest supplier of transport fuels. Aviation turbine fuel is generally sourced from the Middle East.

**Gas:** Norway accounted for 75% of UK gas imports in 2017, with pipelines from Netherlands and Belgium supplying 6% and 4% respectively. The remaining 15% arrived as Liquefied Natural Gas (LNG), of which 84% was from Qatar.

## OVERALL ENERGY

### Proportion of UK energy supplied from low carbon sources, 2000 to 2017



	Percentage					
	2000	2010	2014	2015	2016	2017
Nuclear	8.4%	6.3%	7.1%	7.9%	7.9%	7.9%
Wind	0.0%	0.4%	1.4%	1.8%	1.6%	2.2%
Solar	0.0%	0.0%	0.2%	0.4%	0.5%	0.5%
Hydro	0.2%	0.1%	0.3%	0.3%	0.2%	0.3%
Bioenergy	0.9%	2.7%	4.6%	5.5%	6.0%	6.4%
Transport fuels	0.0%	0.6%	0.6%	0.5%	0.5%	0.5%
Other	0.0%	0.0%	0.1%	0.5%	0.5%	0.5%
<b>Total</b>	<b>9.4%</b>	<b>10.2%</b>	<b>14.3%</b>	<b>16.8%</b>	<b>17.4%</b>	<b>18.4%</b>

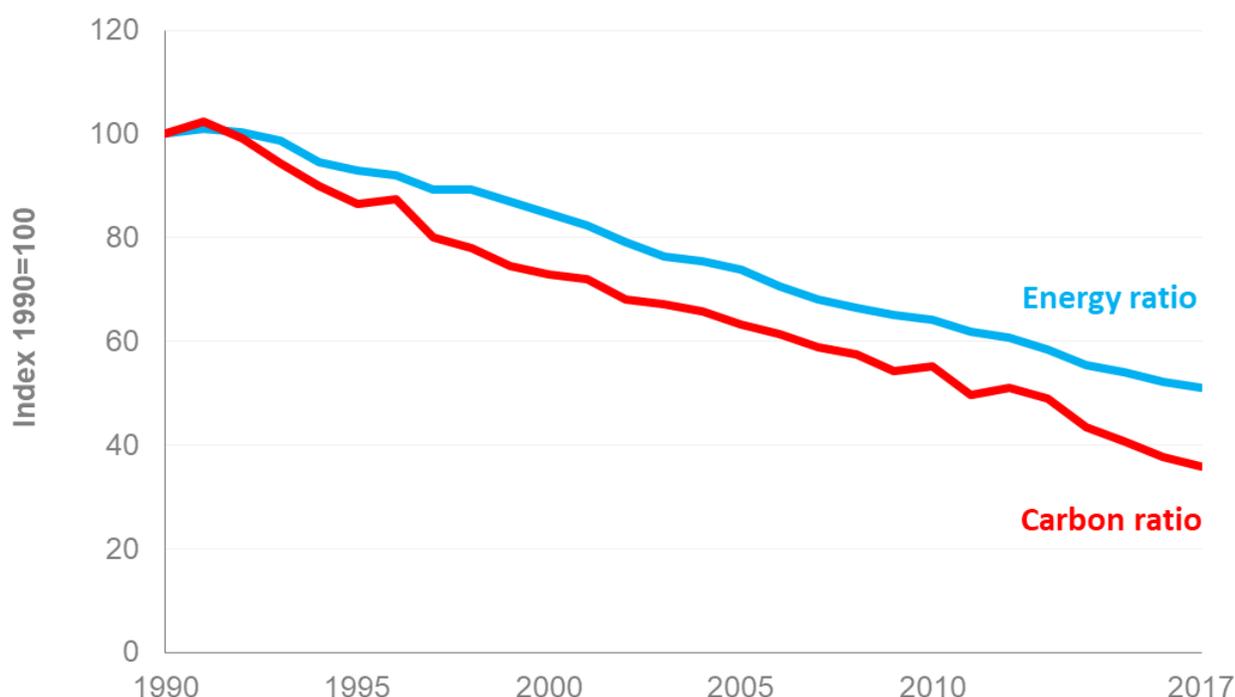
In 2017 the UK obtained 18% of its primary energy from low carbon sources, with 43% of this from nuclear power. The second largest component of low carbon was bioenergy, accounting for 35% of the total low carbon energy sources.

Energy supply from biofuels increased by 5%; with more use of anaerobic digestion, wood pellets and energy from waste. Solar was up by 10% reflecting increased capacity. The supply of nuclear fell by 2% due to outages, but with its share remaining broadly similar to 2016.

Energy supply from wind increased by 34% in 2017, with capacity up by 23% and wind speeds 0.4 knots higher than in 2016.

## OVERALL ENERGY

### Energy and carbon ratios, 1990 to 2017



	Index 1990=100				
	1990	2000	2010	2016	2017
Primary energy consumption*	100	108.4	96.4	88.3	88.1
Carbon dioxide emissions	100	93.2	82.9	63.8	61.8
GDP	100	127.9	150.1	169.4	172.2
<b>Energy ratio</b>	<b>100</b>	<b>84.8</b>	<b>64.3</b>	<b>52.1</b>	<b>51.1</b>
<b>Carbon ratio</b>	<b>100</b>	<b>72.9</b>	<b>55.3</b>	<b>37.7</b>	<b>35.9</b>

\* Temperature corrected primary energy consumption.

The energy ratio is calculated by dividing temperature corrected primary energy consumption by GDP at constant prices, with the carbon ratio similarly calculated by dividing carbon dioxide emissions by GDP. Both ratios have fallen steadily, with the energy ratio declining by around 2½% per year and the carbon ratio declining at a faster pace of just over 3½% per year.

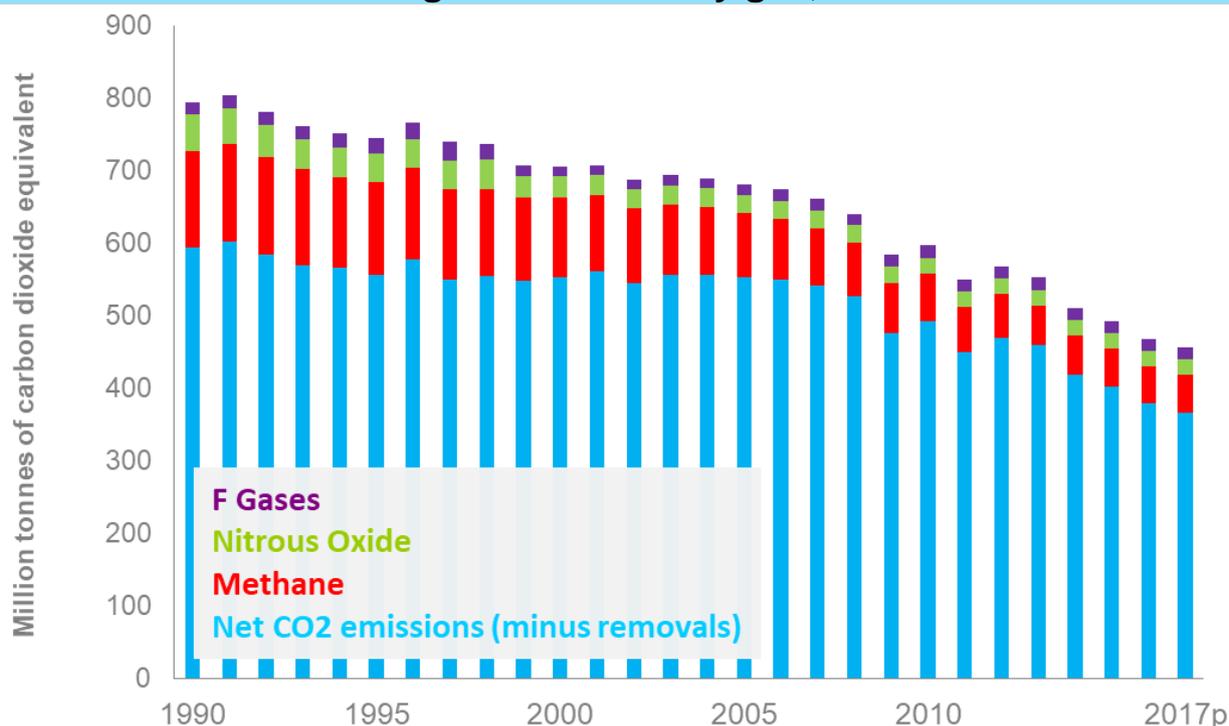
The downward trends are due to a number of factors, with improvements in energy efficiency and the decline in the relative importance of energy intensive industries affecting both ratios. The carbon ratio has been improved further by the increased use of more carbon efficient fuels and renewables.

The sharp downward ticks in the carbon ratio in both 2011 and 2014 are due, in the main, to temperatures, with energy consumption decreasing in response to the warmer weather. The reduction in 2017 is mainly down to fuel switching with less coal used for generation.

Latest International Energy Agency data shows that the energy ratio is falling in all G8 countries. The UK is estimated to have the lowest energy ratio in the G8.

## CLIMATE CHANGE

### Greenhouse gas emissions by gas, 1990 to 2017



**Million tonnes of carbon dioxide equivalent**

	1990	2000	2010	2015	2016	2017p
Carbon dioxide (net emissions)	594.1	553.7	492.7	402.5	378.9	366.9
Methane	133.2	109.1	64.5	51.6	51.6	51.6
Nitrous oxide	49.6	29.9	22.5	21.5	21.4	21.4
HFC	14.4	9.8	16.4	15.9	15.2	15.2
PFC	1.7	0.6	0.3	0.3	0.4	0.4
SF <sub>6</sub>	1.3	1.8	0.7	0.5	0.5	0.5
NF <sub>3</sub>	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total Greenhouse gas emissions</b>	<b>794.2</b>	<b>705.0</b>	<b>597.1</b>	<b>492.4</b>	<b>467.9</b>	<b>455.9</b>

*Source: Ricardo Energy and Environment, BEIS (2017 provisional figures)*

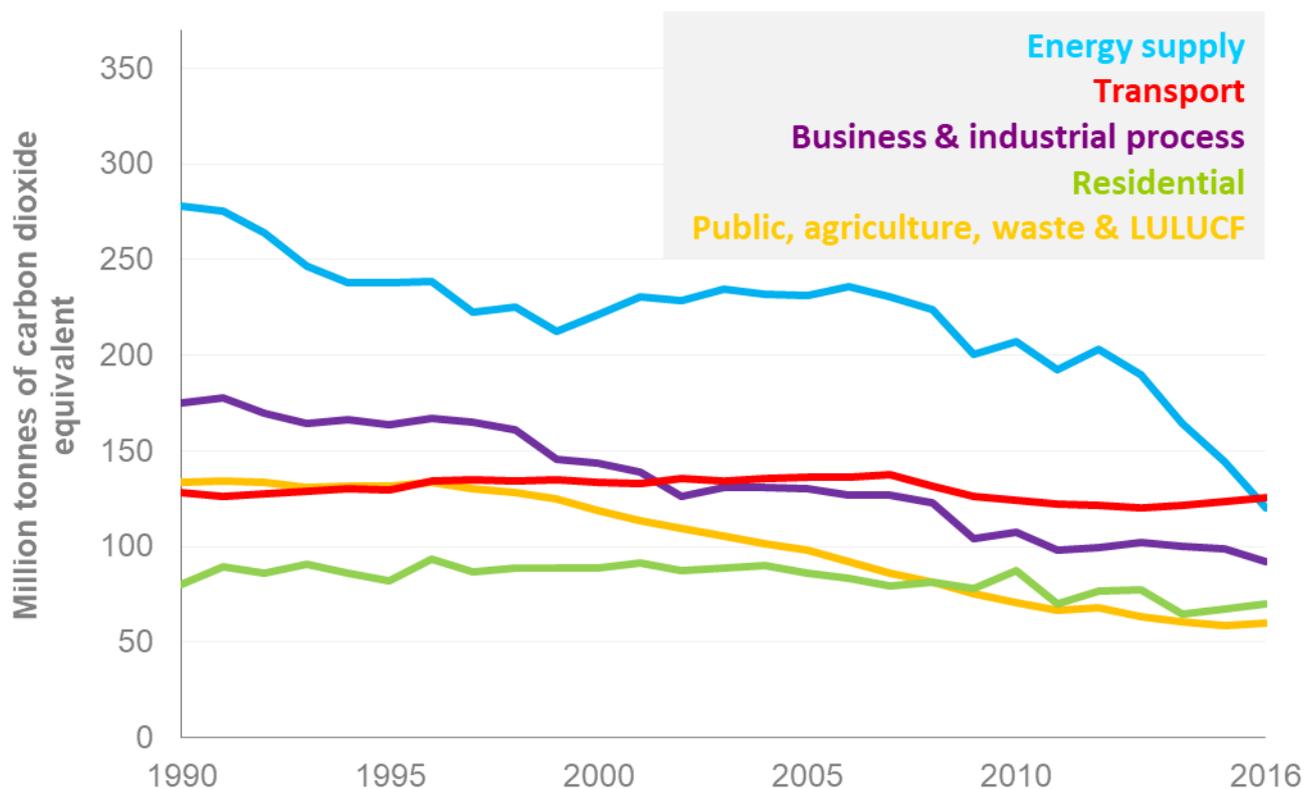
*All figures are for the UK only and exclude Crown Dependencies and Overseas Territories*

In 2017 UK emissions were provisionally estimated to be 455.9 million tonnes of carbon dioxide equivalent. This was 2.6% lower than the 2016 figure of 467.9 million tonnes and 43% lower than the 1990 figure of 794.2 million tonnes. Carbon dioxide emissions, which are primarily created when fossil fuels are burned, were estimated to account for about 80% of total UK anthropogenic greenhouse gas emissions in 2017. Estimates based on energy production and consumption in 2017 indicate that carbon dioxide emissions were 3.2% lower than the previous year and 38% lower than in 1990.

The decrease in emissions since 2016 can largely be attributed to a change in the fuel mix for electricity generation, with less use of coal and gas and increased use of renewables.

## CLIMATE CHANGE

### Greenhouse gas emissions by National Communication sector, 1990 to 2016



**Million tonnes of carbon dioxide equivalent**

	1990	2000	2005	2010	2015	2016
Energy supply	277.9	221.0	231.3	207.2	144.4	120.2
Residential	80.2	88.7	85.7	87.5	67.4	69.8
Public, Agriculture, Waste Management and LULUCF	133.4	118.7	98.0	70.6	58.2	60.0
Business and Industrial process	174.7	143.3	130.4	107.4	98.9	92.1
Transport	128.1	133.3	136.0	124.4	123.4	125.8
<b>Total greenhouse gas emissions</b>	<b>794.2</b>	<b>705.0</b>	<b>681.3</b>	<b>597.1</b>	<b>492.4</b>	<b>467.9</b>

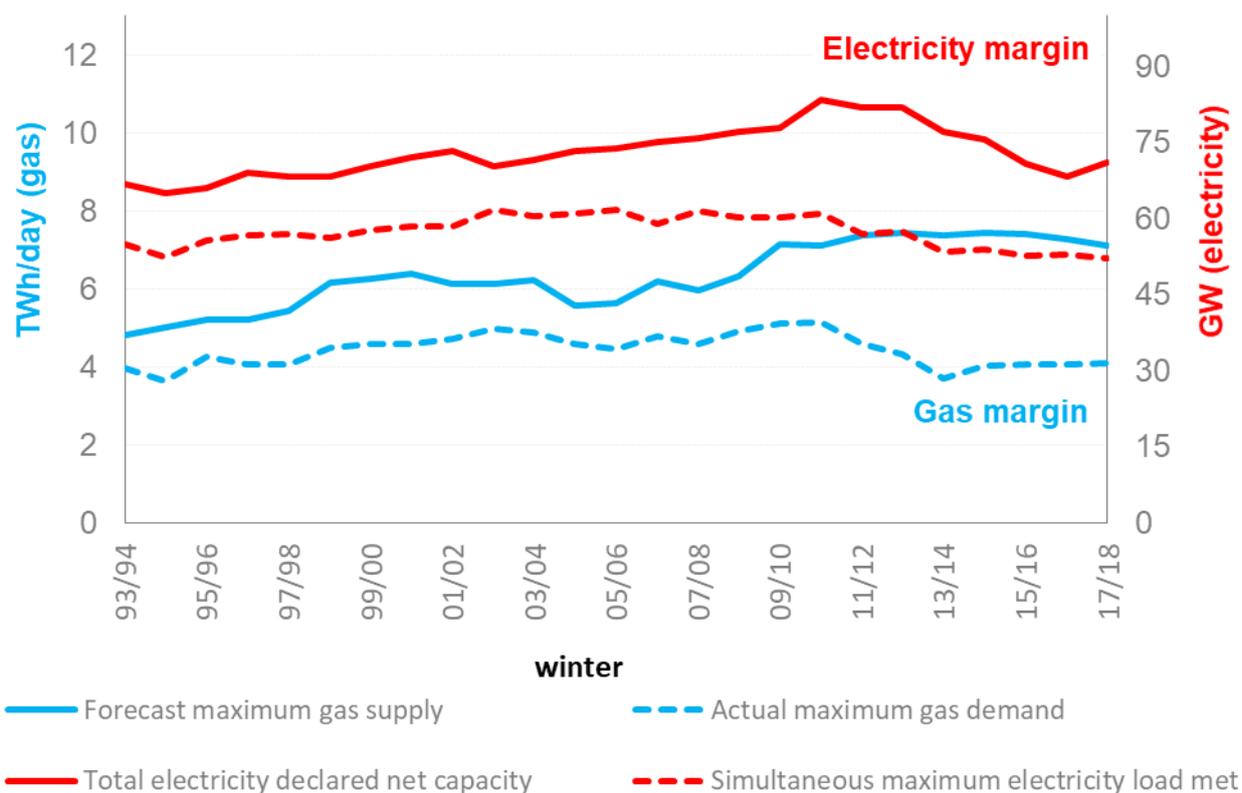
*Source: Ricardo Energy and Environment, BEIS (2016 final figures)*

*LULUCF – land use, land use change and forestry*

*All figures are for the UK only and exclude Crown Dependencies and Overseas Territories*

In 2016 UK greenhouse gas (GHG) emissions were estimated to be 467.9 million tonnes of carbon dioxide equivalent (MtCO<sub>2</sub>e), 41% lower than in 1990. The transport sector was the largest single source of GHG emissions in 2016, accounting for 27% of total emissions. Between 1990 and 2016, emissions from this sector decreased by 2%. In 2016 GHG emissions from the energy supply sector accounted for 26% of emissions and have decreased by 57% since 1990 due to changes in the electricity mix. Emissions from the residential sector accounted for around 15% of emissions in 2016; and since 1990 emissions from this sector have decreased by 13%.

**Reliability – gas and electricity capacity margins – maximum supply and maximum demand 1993/94 to 2017/18**



Source: National Grid and BEIS

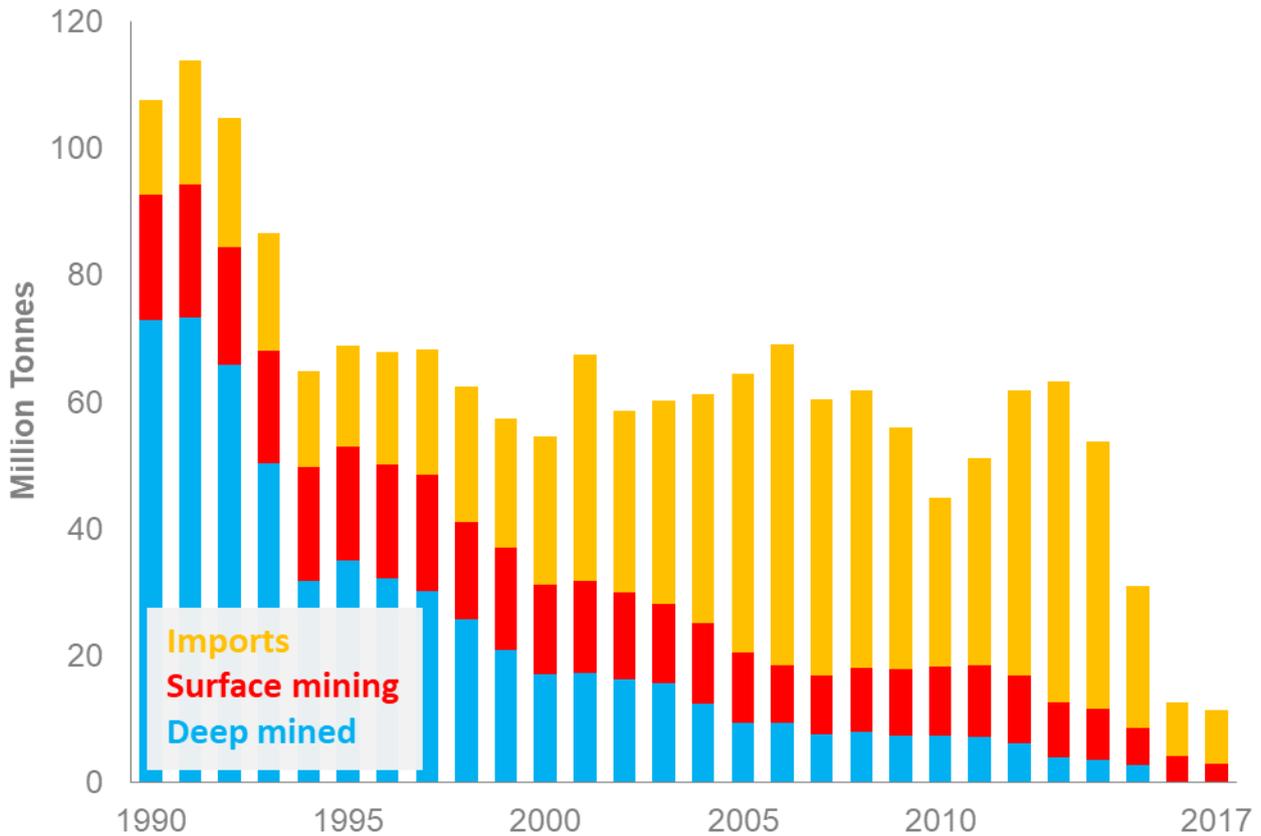
Whilst energy security is complex to measure and subsequent charts on individual fuels provide fuller insight, this chart aims to provide a view on it by looking at the difference between maximum supply and demand for gas and electricity.

From 2007/08 to 2014/15 the electricity capacity margin mainly increased year on year, due to both a decrease in peak demand and an increase in capacity. However, from 2013/14 to 2016/17 the capacity of major power producers fell faster than peak demand due to plant closures and conversions. This resulted in the capacity margin falling from a peak of 44% in 2013/14 to 29% in 2016/17, the lowest since 2009/10. Whilst embedded renewables capacity increased over that period, the intermittent nature of solar and wind meant it did not cover the drop due to closures of major power producers. A drop in peak demand in 2017/18 and an increase in generation capacity saw the margin rise to 36%.

Between 2008/09 and 2013/14 the gas capacity margin increased year on year due to both increased supply (e.g. through the new terminals to supply liquefied natural gas), coupled with reduced demand. The last few years have been broadly stable, although the margin decreased slightly in 2016 and 2017 due to higher demand from domestic customers and because of the switch from coal to gas for power generation.

## COAL

### Coal production and imports, 1990 to 2017



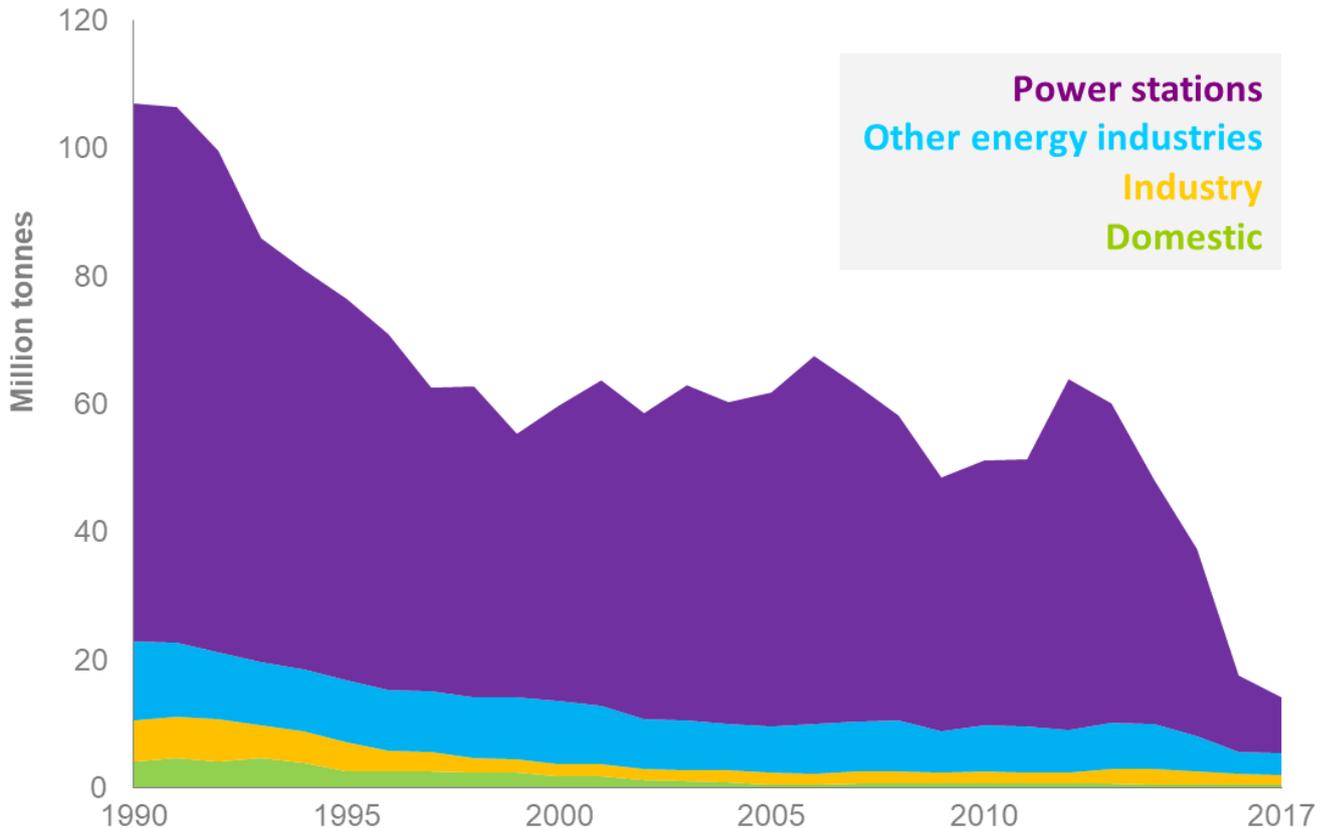
	Million tonnes				
	1990	2000	2010	2016	2017
Deep mined	72.9	17.2	7.4	0.02	0.02
Surface mining (including slurry)	19.9	14.0	11.0	4.2	3.0
<b>Total</b>	<b>92.8</b>	<b>31.2</b>	<b>18.4</b>	<b>4.2</b>	<b>3.0</b>
Coal imports	14.8	23.4	26.5	8.5	8.5

In 2017 UK coal production fell to an all-time low of 3 million tonnes, 27% lower than in 2016. Following closure of the last three deep mines in 2015 (Hatfield, Thoresby and Kellingley), production fell to a fraction of the previous values. At 20 thousand tonnes, deep mined coal comprises less than 1 per cent of total production. In 2017 surface mine production fell by 27% to a new record low of 3 million tonnes. This was mainly due to one of the large surface mines not producing since April 2017 (it is under 'care and maintenance'), along with the closure of a number of mines in 2015. Other mines produced less coal as they are coming to the end of operation.

Imports started in 1970, and grew steadily. In 2001 imports exceeded the level of UK production for the first time. As annual levels of UK coal production continued to fall, imports continued to grow and in 2006 reached a new record of 50.5 million tonnes. Demand from electricity generators declined over the next five years and imports fell accordingly. However, in the three years from 2011, higher gas prices led to greater demand for coal from electricity generators and imports rose again up to 2013 when they stood at 50.6 million tonnes, just above the 2006 record. From 2014 to 2016 imports fell once more as coal-fired electricity generation shrank and in 2016 were at 8 million tonnes, a 33 year low. In 2017 imports were near identical to the value of imports in 2016.

## COAL

### Coal consumption, 1990 to 2017

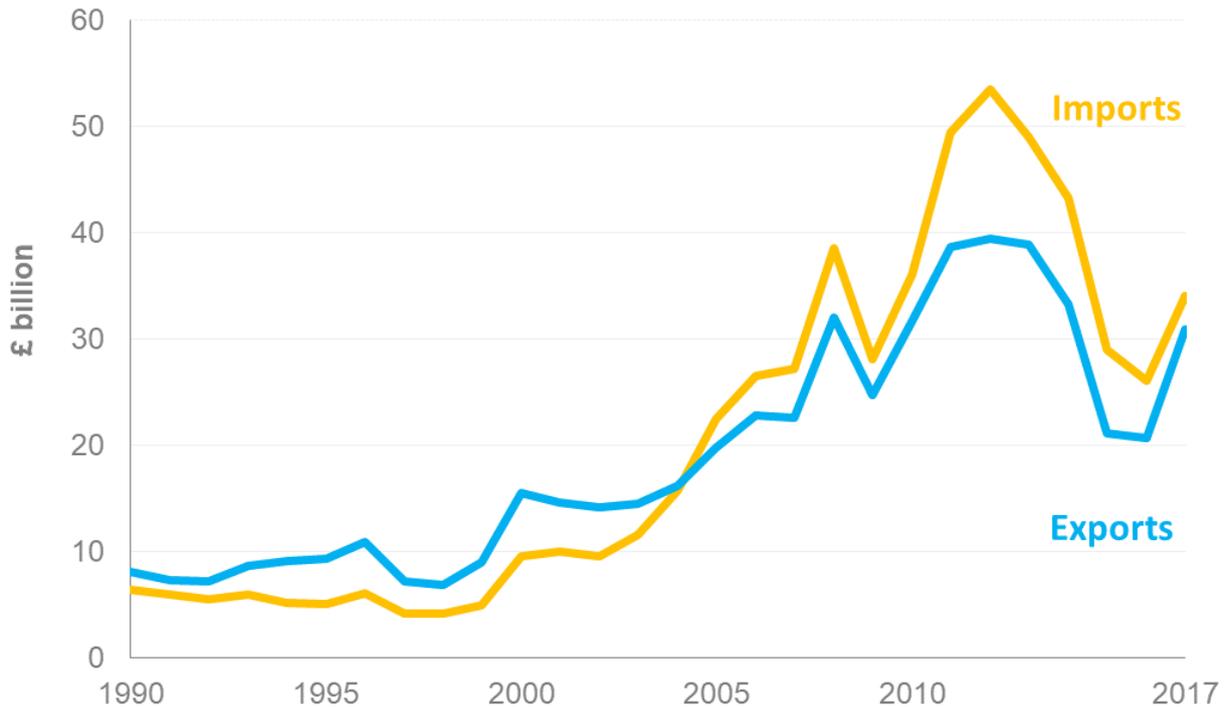


	Million tonnes				
	1990	2000	2010	2016	2017
Power stations	84.0	46.2	41.5	12.1	8.7
Domestic	4.2	1.9	0.7	0.6	0.5
Industry	6.3	1.9	2.0	1.7	1.5
Services	1.2	0.08	0.06	0.06	0.05
Other energy industries	12.5	9.8	7.1	3.4	3.4
<b>Total consumption</b>	<b>108.3</b>	<b>59.9</b>	<b>51.4</b>	<b>17.9</b>	<b>14.2</b>

In 1990 coal generation was 84 million tonnes and fell steadily after 1991 until 1999. After rising to an 11 year high in 2006 (57 million tonnes), coal used by generators fell steadily between 2006 and 2009 before stabilising then increasing sharply in 2012 due to high gas prices, which allowed coal fired stations to generate electricity at a lower cost than some gas fired stations. Coal use in electricity generation has fallen since 2012, due to an overall decline in coal power station capacity. In 2017 coal use in electricity generation fell to a record low of 9 million tonnes. The decline was due to reduced capacity, with the closure of Longannet and Ferrybridge C in 2016. In addition to that production favoured gas over coal, partly due to the carbon price per GWh being higher for coal. In 2017, coal use in electricity generation accounted for 62% of total coal demand.

## PETROLEUM

### Foreign trade in crude oil and petroleum products, 1990 to 2017



#### Crude oil and petroleum products

£ billion

	1990	2000	2010	2016	2017
Exports	8.1	15.5	31.6	20.6	30.9
Imports	6.4	9.5	36.0	26.0	34.1
<b>Net Imports</b>	<b>-1.6</b>	<b>-6.0</b>	<b>4.4</b>	<b>5.4</b>	<b>3.2</b>

Source: Office for National Statistics

#### Crude oil and petroleum products

Million tonnes of oil equivalent

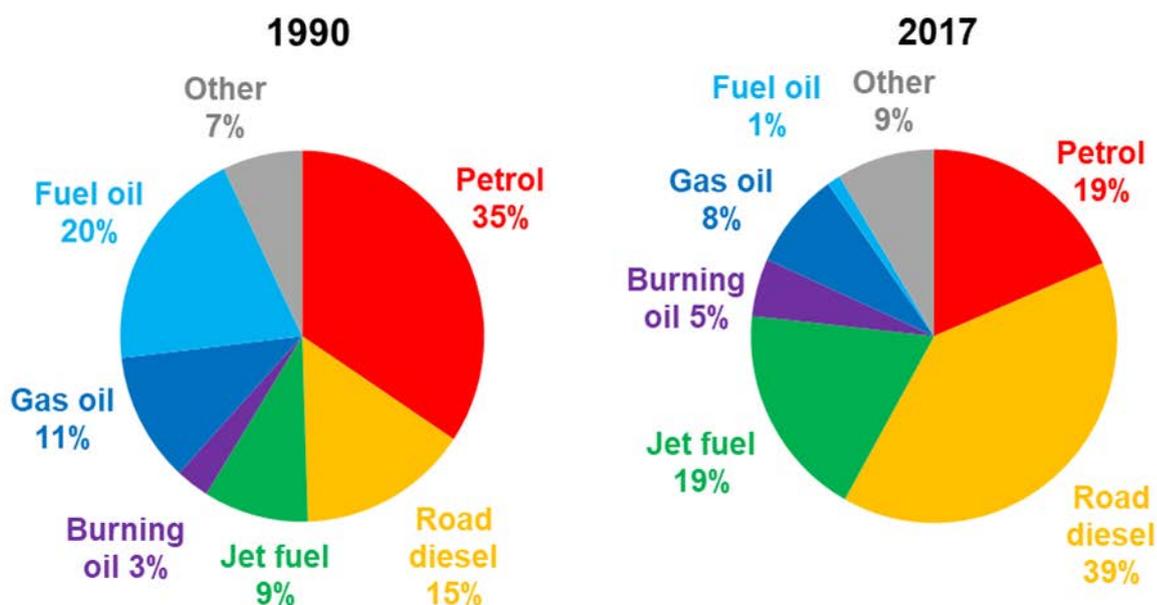
	1990	2000	2010	2016	2017
Exports	80.4	123.9	74.4	64.8	67.4
Imports	69.2	74.8	85.9	91.9	95.2
<b>Net Imports</b>	<b>-11.2</b>	<b>-49.1</b>	<b>11.5</b>	<b>27.1</b>	<b>27.8</b>

Source: BEIS

Between 1980 and 2004, a surplus in trade led to oil contributing more than £90 billion to the UK balance of payments. The largest surplus of £8 billion in 1985 reflected high crude oil production and prices. In 1990 the surplus fell from its peak due to lower prices but managed to peak again in 2000 at £6.0 billion. However, in 2005, the UK became a net importer of oil with a deficit of £2.7 billion, though still an exporter of oil products. Between 2005 and 2017 the cumulative deficit amounted to just under £87 billion. Following the peak in 2012 the deficit has steadily declined and in 2017 was £3.2 billion, down 40% on a year earlier due to low crude oil prices.

PETROLEUM

Demand by product, 1990 and 2017



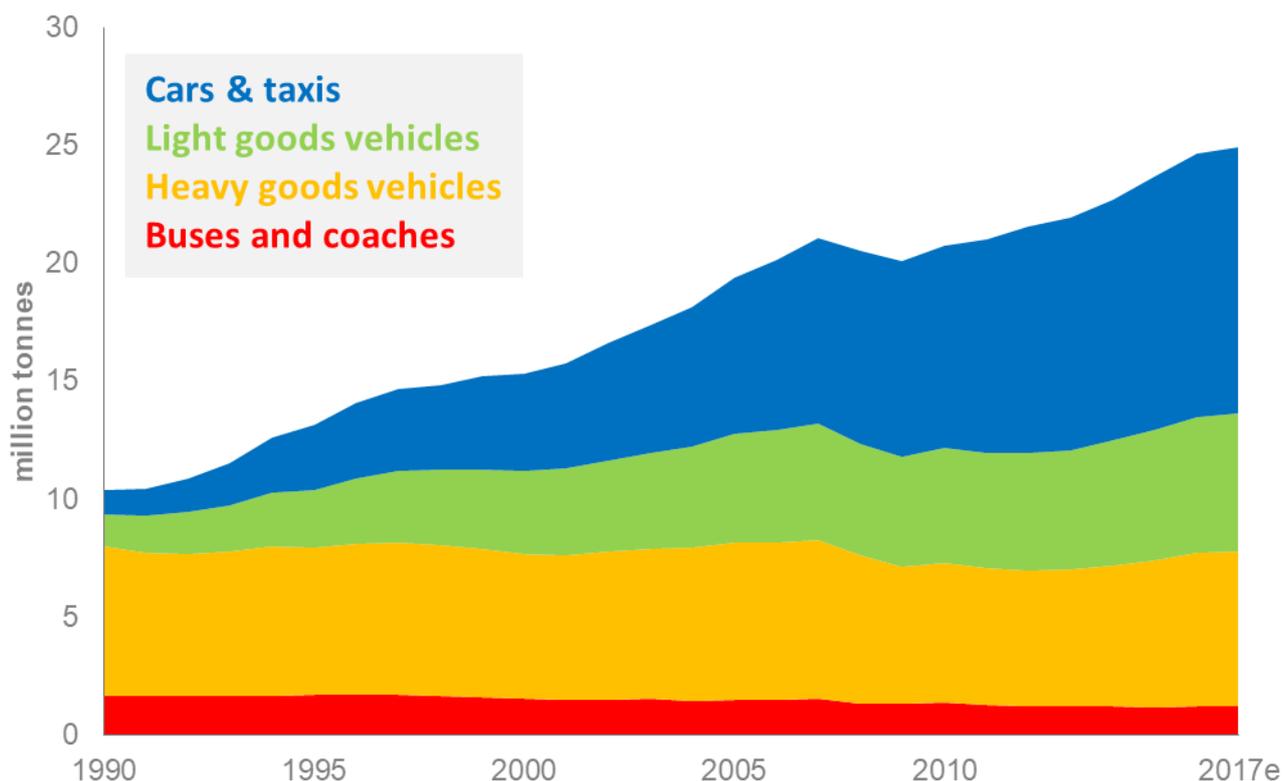
	Million tonnes				
	1990	2000	2010	2016	2017
<b>Energy uses*</b>					
Petrol	24.3	21.4	14.6	12.0	11.7
Road diesel	10.7	15.6	20.7	24.6	24.9
Jet fuel	6.6	10.8	11.1	11.4	11.8
Burning oil	2.1	3.8	4.0	3.3	3.2
Gas oil	8.0	6.8	5.1	5.2	5.3
Fuel oil	14.0	3.3	1.9	0.8	0.7
Other	5.0	5.3	6.1	5.2	5.5
<b>Total energy uses</b>	<b>70.7</b>	<b>67.1</b>	<b>63.6</b>	<b>62.7</b>	<b>63.1</b>
Of which:					
Transport fuels	43.5	49.5	48.1	49.5	50.0
Industry	7.2	5.5	5.1	4.0	4.0
Refinery fuel use	5.1	5.3	4.4	3.4	3.4
<b>Non-energy uses</b>	<b>9.2</b>	<b>10.1</b>	<b>7.1</b>	<b>6.7</b>	<b>6.6</b>
<b>Total demand</b>	<b>79.8</b>	<b>77.2</b>	<b>70.7</b>	<b>69.4</b>	<b>69.8</b>

\* Energy uses includes uses for transformation (e.g. electricity generation) and energy industry own use (e.g. refinery fuels)

In the long term, demand for oil products has been in decline since 1990 and the mix of products consumed has changed dramatically. Transport now represents nearly 80% of energy demand, a substantially larger share than in 1990 as the use of fuel oil for electricity generation has declined and air travel has become more common. Although the total of diesel and petrol sales is similar to what it was in 1990, consumption has increased for diesel and decreased for petrol.

## PETROLEUM

### Demand for road fuels, 1990 to 2017



Total deliveries of diesel road fuel (DERV) have more than doubled since the early 1990s and have increased further this year. The long term trend is mainly caused by the increased use of DERV in cars, taxis and light goods vehicles.

Demand for DERV by Vehicle Type	Thousand tonnes				
	1990	2000	2010	2016	2017*
Car & taxi	980	4,110	8,590	11,220	11,340
Light goods vehicles	1,370	3,530	4,830	5,910	5,970
Heavy goods vehicles	6,370	6,150	5,940	6,420	6,480
Buses & coaches	1,640	1,530	1,380	1,110	1,120
<b>Total</b>	<b>10,370</b>	<b>15,310</b>	<b>20,740</b>	<b>24,650</b>	<b>24,910</b>

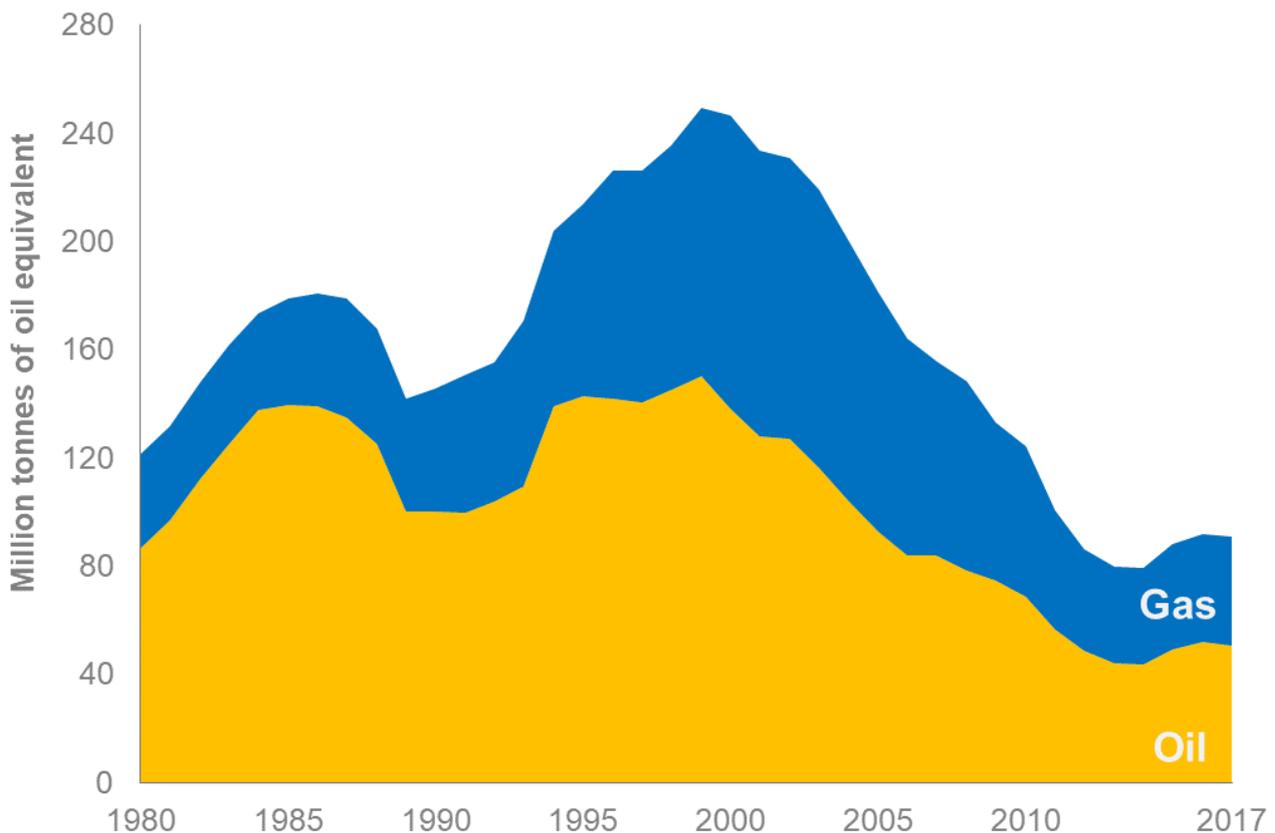
\*Based on modelling by Ricardo Energy & Environment using data from the National Atmospheric Emissions Inventory.

Demand for petrol decreased further in 2017 as diesel continued to displace petrol in road transport. The dieselisation of the car fleet continued in 2017 but not as dramatically as in previous years. Petrol consumption by cars and taxis fell to 11.7 million tonnes in 2017, while diesel consumption rose to 11.3 million tonnes.

Demand for Petrol	Thousand tonnes				
	1990	2000	2010	2016	2017
<b>Total</b>	<b>24,300</b>	<b>21,400</b>	<b>14,600</b>	<b>12,000</b>	<b>11,700</b>

## OIL AND GAS PRODUCTION

### UK Continental Shelf production, 1980 to 2017



**Million tonnes of oil equivalent**

	<b>1980</b>	<b>1990</b>	<b>2000</b>	<b>2010</b>	<b>2016</b>	<b>2017</b>
Oil	86.9	100.1	138.3	69.0	52.0	50.9
Gas	34.8	45.5	108.4	55.3	39.9	40.0
<b>Total</b>	<b>121.7</b>	<b>145.6</b>	<b>246.7</b>	<b>124.3</b>	<b>91.9</b>	<b>90.9</b>

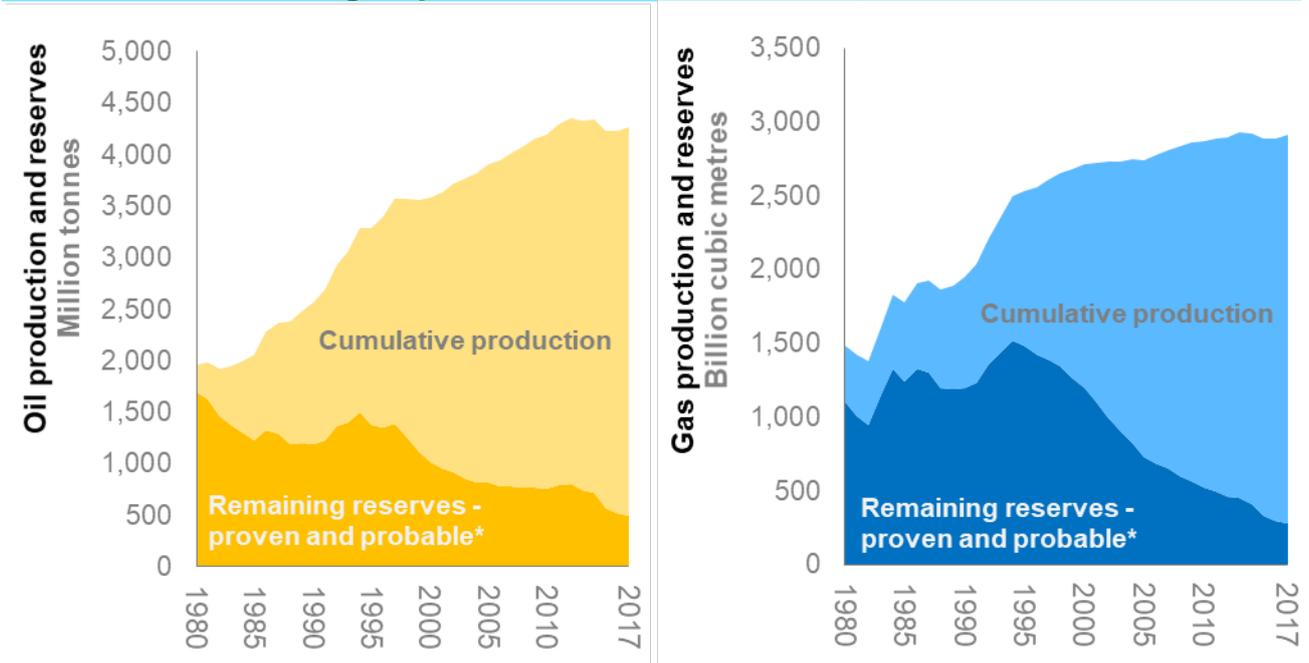
Total indigenous oil and gas production was down 1% on 2016. This decrease is less than the average decline rate of 5% since UKCS production peaked in 1999.

Oil production in 2017 was 66% lower than the record 150.2 million tonnes in 1999 and this year it decreased by 2% on last year, a contrast to the decline rate of around 6% seen since the turn of the century. Production was aided by the reopening of the Schiehallion field in April after the completion of redevelopments which began in 2013. The new Kraken field also began producing in June. In contrast the Forties Pipeline System went through an emergency outage in December lasting three weeks, leading to a significant drop in UK oil production for the month.

Gas production in 2017 was 63% lower than the record levels seen in 2000, and since the turn of the century gas production has been decreasing by around 5% per year. Gas production in 2017 was stable on 2016. The Rough storage facility began to draw down on its remaining gas reserves contributing to gas production figures.

## OIL AND GAS PRODUCTION

### Oil and gas production and reserves, 1980 to 2017



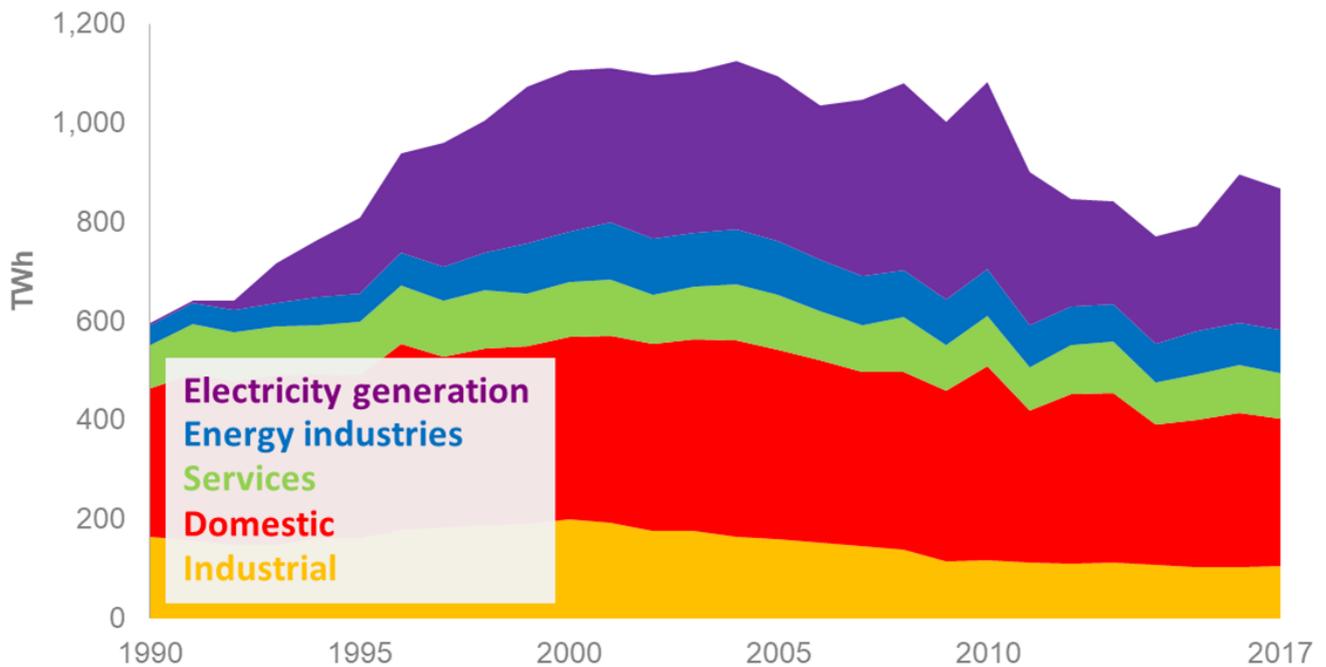
\* From 2015, contingent resources have been re-categorised and removed from the probable and proven reserves category.

	1990	2000	2010	2016	2017
<b>Oil</b>					<b>Million tonnes</b>
Cumulative production	1,374	2,570	3,446	3,716	3,763
Proven plus probable reserves	1,195	1,010	751	515	501
<b>Total</b>	<b>2,569</b>	<b>3,580</b>	<b>4,197</b>	<b>4,231</b>	<b>4,264</b>
<b>Gas</b>					<b>Billion cubic metres</b>
Cumulative production	752	1,518	2,349	2,592	2,635
Proven plus probable reserves	1,200	1,195	520	297	275
<b>Total</b>	<b>1,952</b>	<b>2,713</b>	<b>2,869</b>	<b>2,889</b>	<b>2,910</b>

For both oil and gas, the volume produced plus proven and probable (2P) reserves have grown substantially since 1980, increasing by 117% for oil and by 96% for gas. The increases reflect new discoveries, new technology allowing exploitation of resources that were previously regarded as uncommercial, and the inclusion of already-known fields as they entered production or moved from 'prospective' to 'probable' status. (Note: this volume for gas does not include estimates of shale gas). Replenishment of sanctioned reserves through exploration and maturation of contingent resources has recently flattened, and in 2016 the reserves replacement ratio was just 13 per cent. The apparent decline in reserves in 2015 was due to re-classification of some reserves that had not yet been sanctioned - these will be included in future as and when sanctioned.

## NATURAL GAS

### Natural gas demand, 1990 to 2017



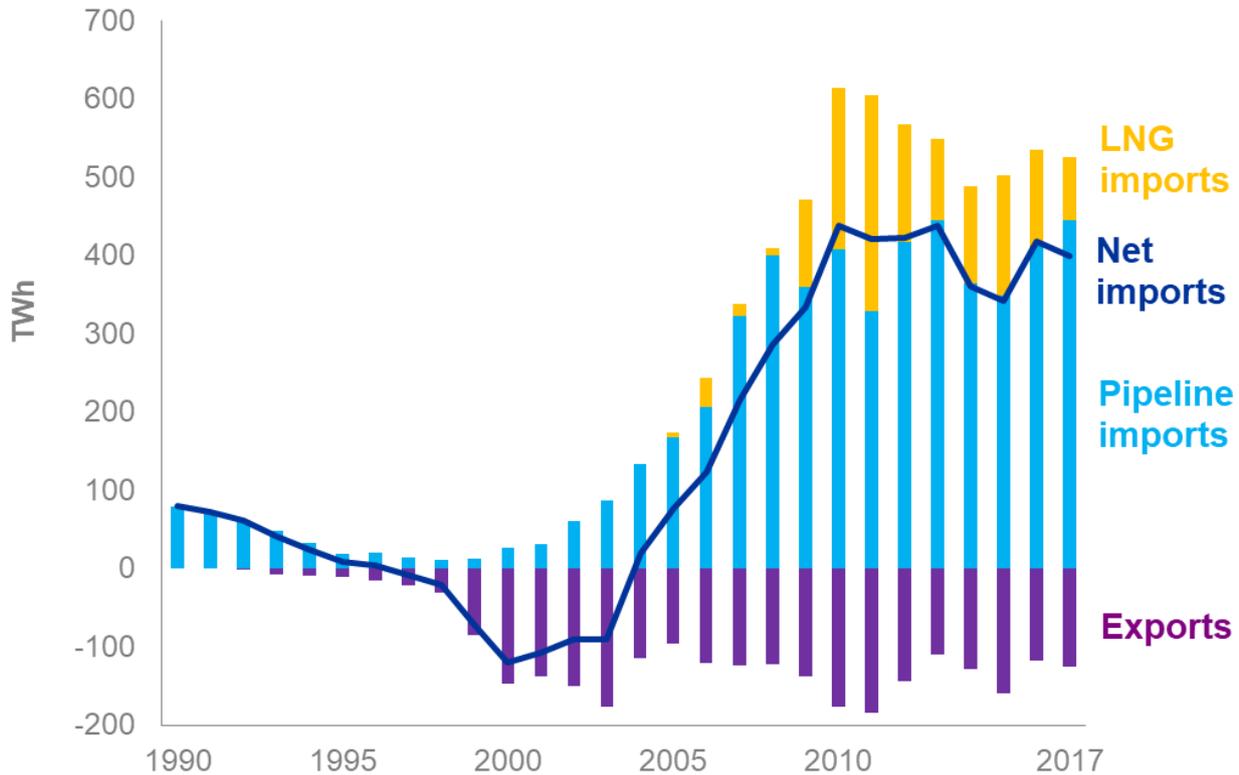
	TWh				
	1990	2000	2010	2016	2017
Electricity generators	6.5	324.6	377.1	298.1	286.0
Energy Industries	39.2	102.8	96.6	87.0	87.1
Industry	164.6	197.8	117.4	102.9	105.9
Domestic	300.4	369.9	389.6	311.4	297.0
Services	86.4	110.5	101.6	95.6	92.5
<b>Total</b>	<b>597.0</b>	<b>1,105.5</b>	<b>1,082.2</b>	<b>894.9</b>	<b>868.6</b>

Following the expansion of UK production of natural gas in the early 1970s demand grew rapidly, reaching a record high in 2004 of 1,125 TWh. Since then demand has seen an overall decline, and in 2017 was around a fifth of the 2004 peak at 868.6 TWh. The longer term trends are driven by commodity prices and changes to energy efficiency, whilst the year to year changes are mainly driven by temperature and shorter term fluctuations in prices.

Overall gas demand was down by 3.0 per cent in 2017 versus 2016. Notably gas used for electricity generation fell by 4.0 per cent as a result of the uptake in low carbon electricity sources such as renewables and nuclear. Domestic and services consumption were also down, 4.6 and 3.3 per cent respectively, driven by comparatively colder temperatures during winter last year.

## NATURAL GAS

### UK trade in natural gas, 1990 to 2017



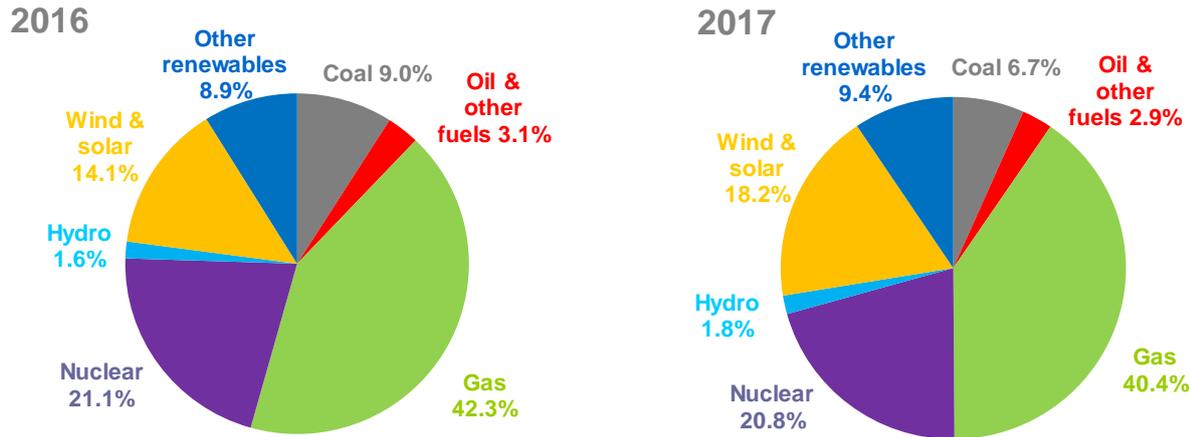
	TWh				
	1990	2000	2010	2016	2017
Natural gas production	528.8	1,260.2	642.5	463.4	464.9
Imports	79.8	26.0	614.5	534.7	524.9
of which					
LNG	-	-	150.1	122.3	80.1
Exports	-	-146.3	-176.4	-116.9	-125.6
Net imports(+) or exports(-)	+79.8	-120.3	+438.1	+417.9	399.3

UK gas production peaked in 2000 and has since been declining, making the UK increasingly reliant on imports to meet demand. Net imports increased substantially in 2016 and remained high at 399 TWh in 2017. This was related partly to the suspension of injections to the Rough Storage Facility, robust demand, and disruption to production in December with the closure of the Forties Pipeline System. In 2017 net imports accounted for around 46 per cent of gas demand, a similar proportion to last year.

Imports of Liquefied Natural Gas (LNG) through the two terminals at Milford Haven (South Hook and Dragon) and via the Isle of Grain remain substantial. However, their shares of total imports continued to decrease, from 23 per cent in 2016 to 15 per cent in 2017. Norway remains the UK's key partner for imports and pipeline imports from Norway accounted for three-quarters of imports in 2017. Whilst demand for LNG on the global market remains strong, the UK has a diverse pipeline infrastructure (from Norway, the Netherlands and Belgium) and the proportion delivered through each route in the future will depend on global market conditions.

## ELECTRICITY

### Electricity generated by fuel type, 2016 and 2017



	TWh				
	1990	2000	2010	2016	2017
Coal	229.8	120.0	107.6	30.7	22.5
Oil & other fuels*	20.7	13.6	10.5	10.4	9.7
Gas	0.4	148.1	175.7	143.4	136.7
Nuclear	63.2	85.1	62.1	71.7	70.3
Hydro	5.6	5.1	3.6	5.4	5.9
Wind & Solar	-	0.9	10.3	47.7	61.5
Other renewables	-	4.3	12.3	30.1	31.9
<b>Total electricity generated</b>	<b>319.7</b>	<b>377.1</b>	<b>382.1</b>	<b>339.3</b>	<b>338.6</b>

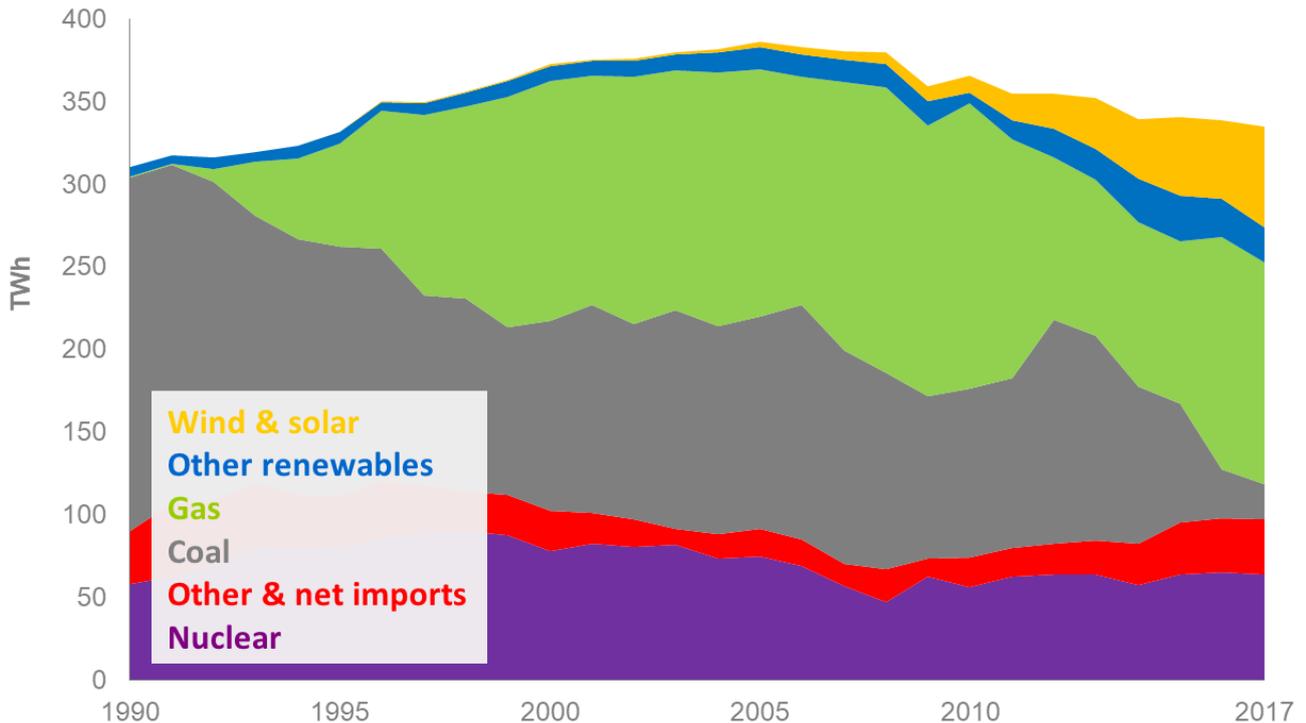
\*Includes generation from pumped storage

Total electricity generated decreased by 1.0% between 2016 and 2017. Continuing coal's declining trend, the share of electricity generated from coal fell further from 9.0% to 6.7%. In contrast to 2016, the share of electricity generation from gas fell from 42.3% to 40.4%; generation from nuclear also decreased slightly from 21.1% to 20.8%. The drop in electricity supplied from fossil fuels was caused by increased generation from renewables, which increased its share of generation from 24.5% to a record 29.3%.

Renewables' generation increased in 2017 due to a 13.6% increase in capacity and higher average wind speeds. Further details on renewable electricity generation can be found on page 32.

## ELECTRICITY

### Electricity supplied by fuel type, 1990 to 2017



The mix of fuels used to generate electricity continues to evolve. Since 1990 the decline of coal and the rise of gas and, in more recent years renewables, have been the most marked features, but none of these fuels have followed a smooth path.

Coal recorded its highest level for ten years in 2006 as nuclear station availability was reduced and as a substitute for high priced gas. Coal use trended downwards until 2010 when higher winter electricity demand resulted in an increase from coal, then rose in 2012 due to high gas prices. Subsequently, supply from coal has fallen each year due to plant closures and conversions, continuing in 2017 to reach a new record low of 21.4 TWh.

Between 1990 and 2008, supply from gas rose significantly from 0.4 TWh to a peak of 173 TWh in 2008. Subsequently, supply has fluctuated with a large increase in 2016, but a 4.6% decrease in 2017 to 134.2 TWh.

Supply from nuclear grew to a peak in 1998 before falling back, particularly during 2006 to 2008, as station closures and maintenance outages reduced supply, but recovered in 2009 before falling in 2010 due to further outages. Nuclear supply has fluctuated since 2010 with rises compared to the previous year in 2011, 2015 and 2016. However, in 2017 supply from nuclear was 63.9 TWh, a decrease of 1.9% on 2016.

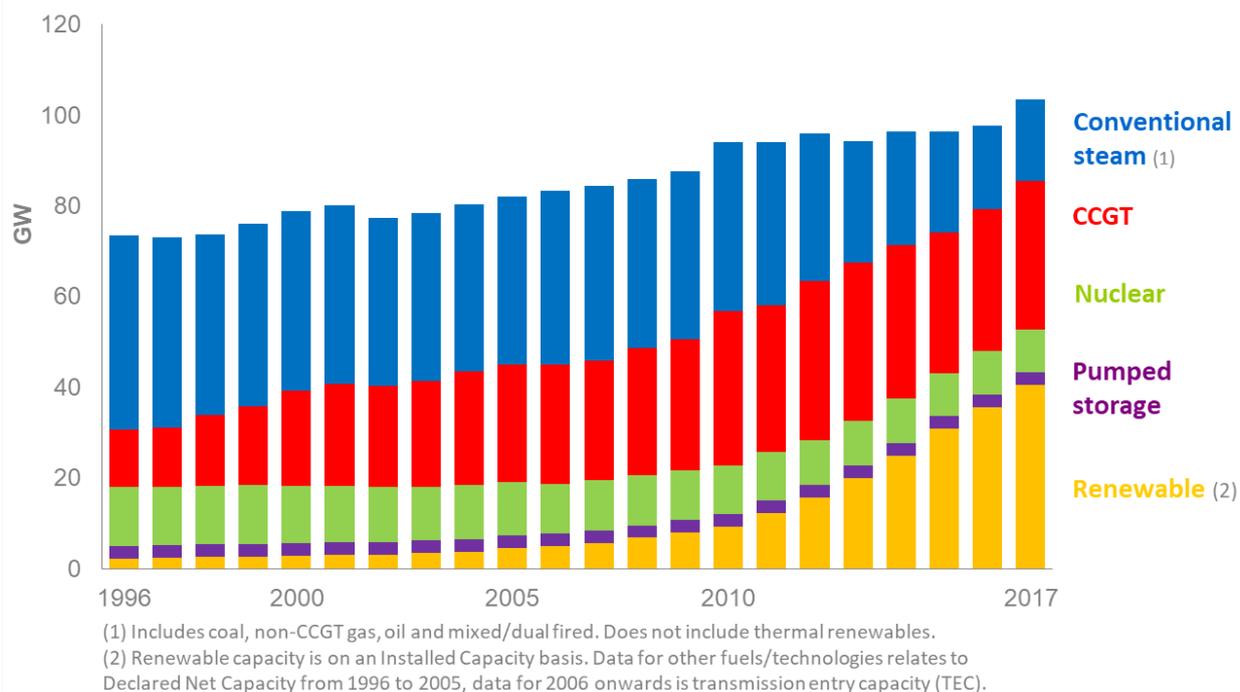
Supply from wind and solar has followed an upward trend since 2000 as generation capacity increased each year. In 2017, wind and solar supply increased significantly by 29.1% to reach 61.5 TWh. This was due to an increase in capacity of 22.6% in wind capacity and 7.3% in solar capacity, while average wind speeds were 0.4 knots higher.

Following repairs to the French interconnector and nuclear outages in France affecting supply and prices, the share of electricity supply from net imports fell from 5.3% to 4.4% in 2017.

Total electricity supplied rose continuously from 1997 to reach a peak in 2005. It has subsequently fallen, reflecting lower demand due to energy efficiency, economic and weather factors, with 2017 supply 15% lower than that in 2005.

## ELECTRICITY

### Electricity capacity, 1996 to 2017



	<b>GW</b>					
	<b>1996</b>	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2016</b>	<b>2017</b>
Conventional Steam	43.0	39.7	37.1	37.1	18.5	18.0
CCGT	12.7	21.1	25.9	34.0	31.3	32.9
Nuclear	12.9	12.5	11.9	10.9	9.5	9.4
Pumped Storage	2.8	2.8	2.8	2.7	2.7	2.7
Renewable	2.3	3.0	4.5	9.3	35.7	40.6
<b>Total</b>	<b>73.6</b>	<b>79.0</b>	<b>82.1</b>	<b>94.0</b>	<b>97.7</b>	<b>103.6</b>

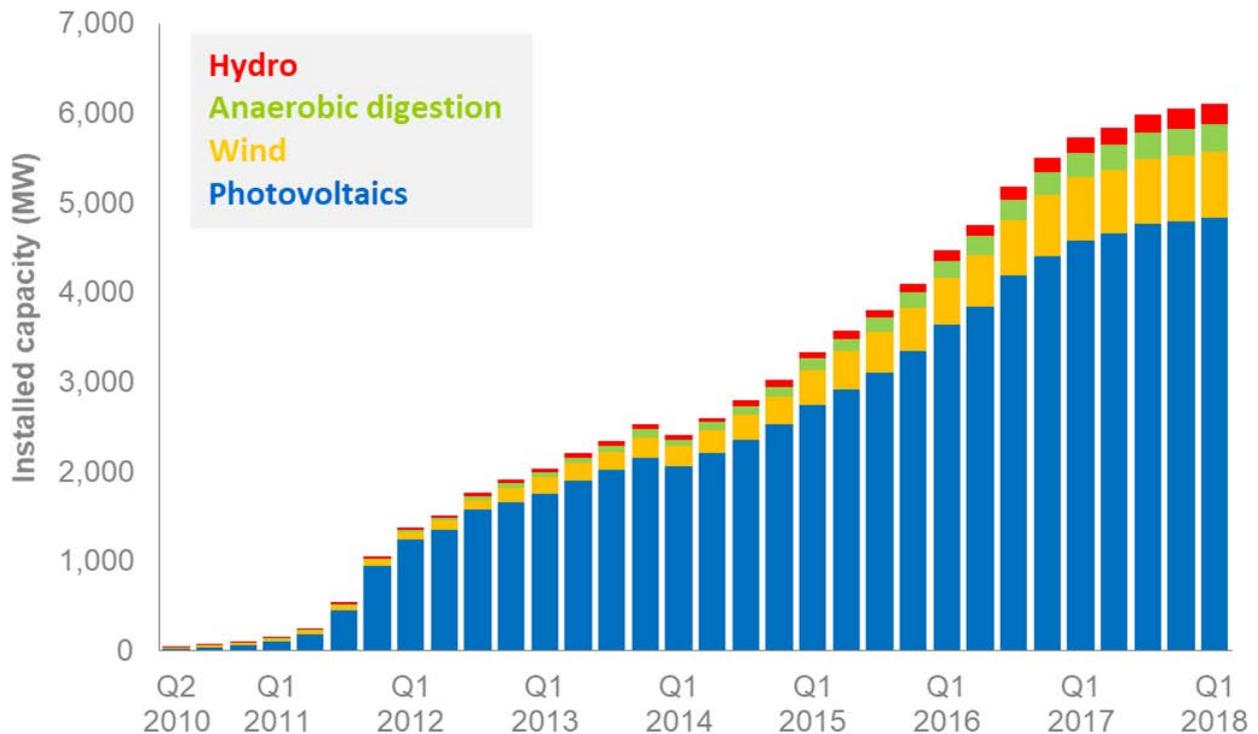
Installed electricity generation capacity in the UK increased gradually between 1996 and 2016, from 73.6 GW to 103.6 GW. Overall, there has been a decline in conventional steam, outweighed initially by an increase in combined cycle gas turbines (CCGT) and more recently by an increase in renewables.

Conventional steam declined by 2.5% between 2016 and 2017 (to 18.0 GW) as a result of the closure of Rugeley. CCGT capacity has increased almost threefold over the period 1996-2013, from 12.7 GW to 34.9 GW, though fell to 31.3 GW in 2016 before increasing slightly to 32.9 GW in 2017.

Nuclear capacity has been gradually falling from 13.0 GW in 1999 to 9.4 GW in 2017, as plants reach the end of their lifetime; this was broadly the same as the capacity in 2016. Renewables capacity has seen a significant increase, with installed capacity increasing by nearly 18 times the capacity in 1996 to 40.6 GW in 2017. This is as a result of an increase in installed wind and solar capacity. Onshore wind capacity rose 18.1 per cent and offshore wind by 32.0 per cent from 2016 to 2017, resulting in overall wind capacity increasing by 22.6 per cent. Solar photovoltaic installed capacity increased by 7.3 per cent over the same period, while other renewables capacity increased by 6.0 per cent.

## FEED IN TARIFFS

### Feed in Tariffs, 2010 to 2018



Cumulative Installed Capacity	MW					
	2011 Q1	2013 Q1	2015 Q1	2016 Q1	2017 Q1	2018 Q1
Micro CHP	0.2	0.5	0.5	0.5	0.5	0.5
Anaerobic Digestion	15	42	77	111	184	228
Hydro	8	54	129	190	267	305
Wind	27	184	387	530	706	741
Photovoltaics	111	1,749	2,745	3,633	4,574	4,832
<b>Total</b>	<b>162</b>	<b>2,030</b>	<b>3,339</b>	<b>4,464</b>	<b>5,732</b>	<b>6,107</b>

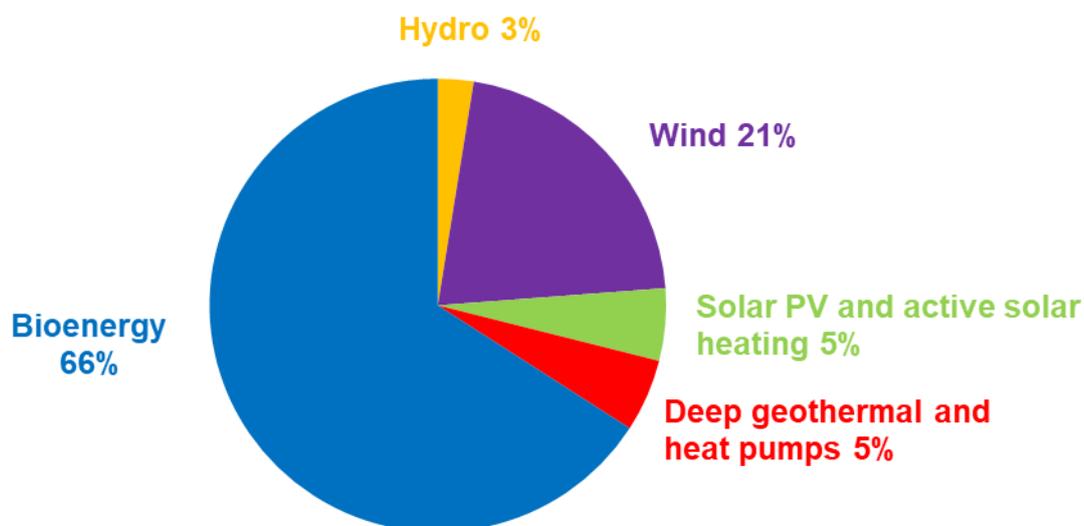
Source: Extracted on 18 April 2018 from the Central Feed-in Tariffs Register (CFR), Ofgem. The register is a live database and is continually being updated and revised, so statistical reports extracted at a later date may not exactly match the totals presented here. Registration on the CFR represents the final stage in the Feed-in Tariff (FiTs) registration process. There will be installations eligible for FiT that have been installed but have not yet been registered onto CFR.

The Feed in Tariff (FiT) scheme was introduced on 1<sup>st</sup> April 2010 and is a financial support scheme for eligible low-carbon electricity technologies, aimed at small-scale installations up to a maximum capacity of 5 Megawatts (MW).

At the end of year 8 (2017/18) of the Feed in Tariff scheme 6,107 MW of capacity (820,591 installations) was installed (and confirmed) on FiTs, around 6.5% more capacity (and 2.9% more installations) than that installed at the end of the previous year. Of the 374 MW increase (23,331 installations) from the end of year 7 (2016/17), 69% (258 MW, 23,041 installations) were from solar photovoltaics, 9% (35 MW, 93 installations) were from wind installations, with the other technologies (micro-CHP, anaerobic digestion and hydro) contributing the remaining 22% of this increase. At the end of 2017/18, 46% (2,781 MW) of the total installed capacity was in the domestic sector.

## RENEWABLES

### Renewable energy sources, 2017



Total renewables used = 20,216 thousand tonnes of oil equivalent (ktoe)

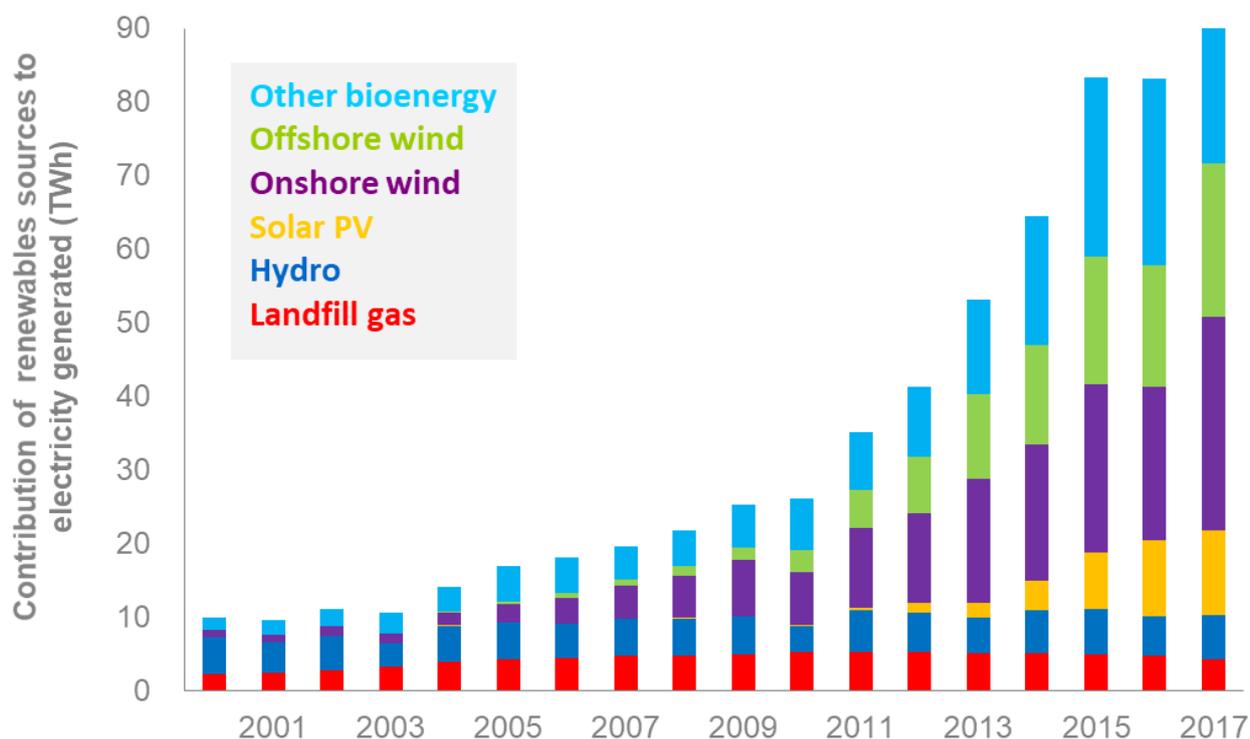
	Thousand tonnes of oil equivalent				
	1990	2000	2010	2016	2017
Solar PV and active solar heating	6	11	41	946	1,043
Wind	1	81	884	3,204	4,300
Hydro (large & small) and wave	448	437	309	463	510
Landfill gas	80	731	1,725	1,556	1,419
Sewage gas	138	169	295	384	401
Wood (domestic and industrial)	174	458	1,653	2,373	2,358
Municipal waste combustion (biodegradable)	101	375	632	1,187	1,278
Heat pumps and deep geothermal	1	1	23	1,066	1,045
Transport biofuels	-	-	1,218	1,010	997
Cofiring	-	-	625	25	18
Other bioenergy	72	265	1,054	6,178	6,845
<b>Total</b>	<b>1,021</b>	<b>2,529</b>	<b>8,460</b>	<b>18,392</b>	<b>20,216</b>

In 2017, bioenergy accounted for roughly two thirds of renewable energy sources used, with most of the remainder coming from wind (21%), solar (5.2%) and heat pumps / deep geothermal (5.2%).

Of the 20.2 million tonnes of oil equivalent of primary energy use accounted for by renewables, 14.0 million tonnes was used to generate electricity, 5.2 million tonnes was used to generate heat, and 1.0 million tonnes was used for road transport. Renewable energy use grew by 10% between 2016 and 2017 and is now almost eight times the level it was at in 2000.

## RENEWABLES

### Electricity generation from renewable sources since 2000



Note: Hydro bar includes shoreline wave/tidal (0.004 TWh in 2017)

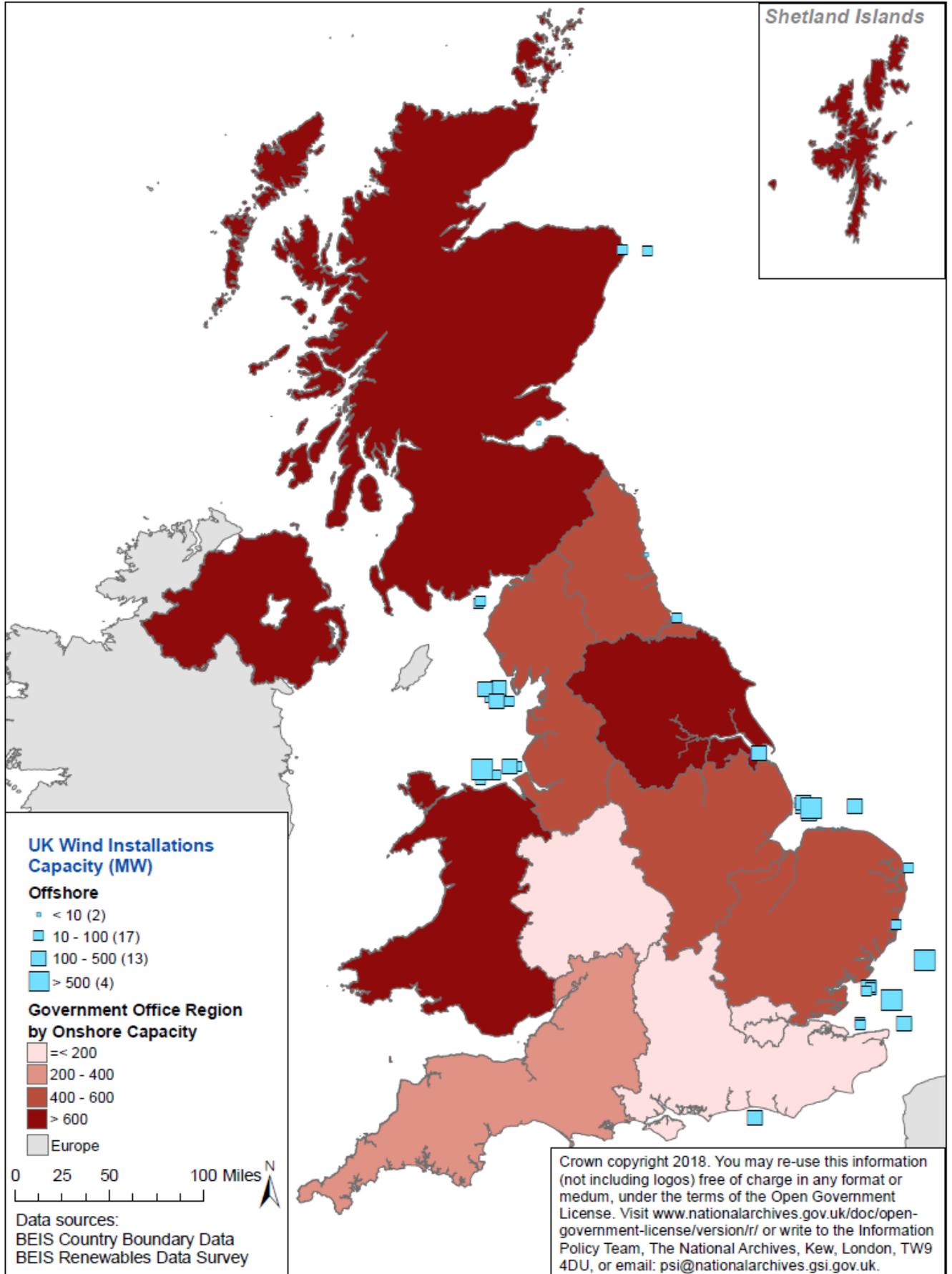
	1990	2000	2010	2016	2017
Onshore wind	-	0.9	7.2	20.9	29.1
Offshore wind	-	-	3.1	16.4	20.9
Solar PV	-	-	0.0	10.4	11.5
Hydro	5.2	5.1	3.6	5.4	5.9
Landfill Gas	0.1	2.2	5.2	4.7	4.3
Other Bioenergy	0.5	1.7	7.0	25.4	27.6
<b>Total Renewables</b>	<b>5.8</b>	<b>9.9</b>	<b>26.2</b>	<b>83.1</b>	<b>99.3</b>

Electricity generated from renewable sources increased by 19 per cent between 2016 and 2017 to 99.3 TWh. Generation was buoyed by large increases in capacity for wind, solar photovoltaics and bioenergy. Total wind generation increased by more than a third (34 per cent) to 50.0 TWh; Offshore wind generation rose by 27 per cent, to a record 20.9 TWh, while onshore wind generation rose by 39 per cent, to a record 29.1 TWh, with higher wind speeds as well as increased capacity. Average onshore wind speeds in 2017, at 8.4 knots, were 0.4 knots higher than in 2016. Hydro generation rose by 9 per cent, with the impact of slightly more capacity in 2017 outweighing that of slightly (0.6 per cent) lower rainfall levels in the main hydro areas. Generation from solar photovoltaics increased by 11 per cent, to a record 11.5 TWh, due to increased capacity.

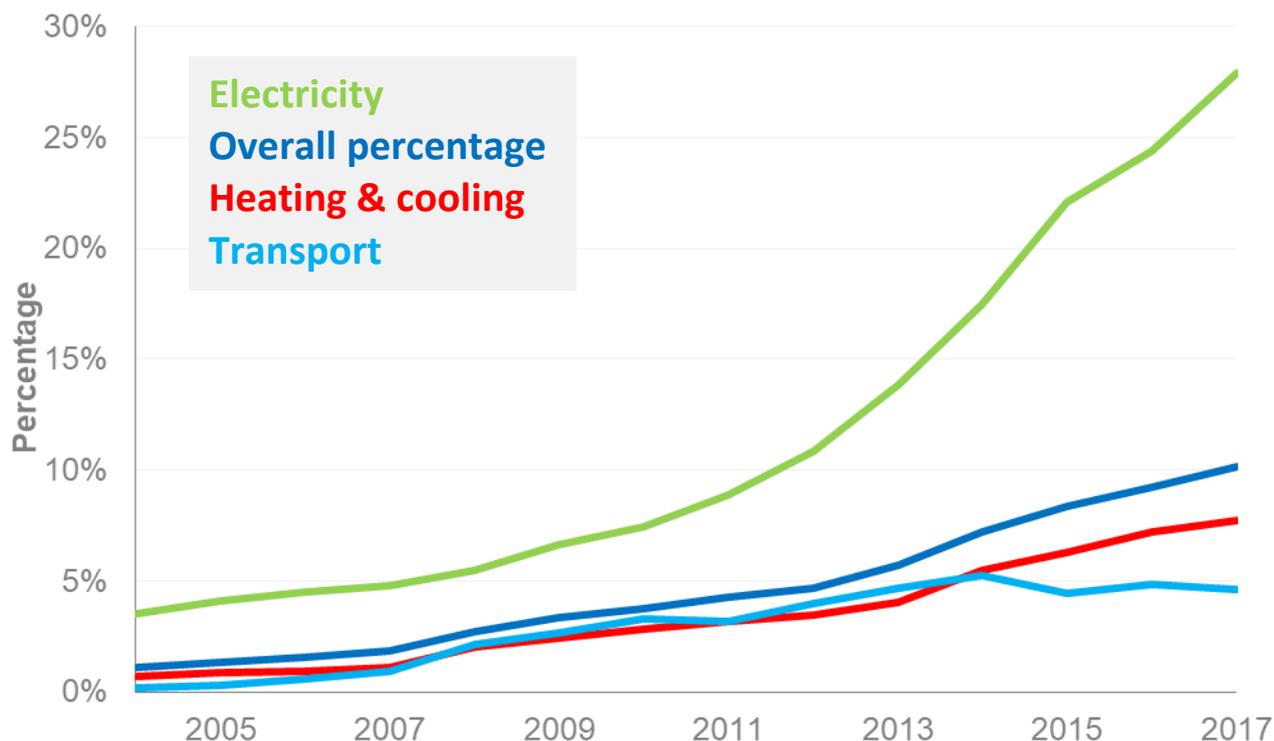
Renewable electricity accounted for 29.3% of electricity generated in the UK during 2017, 4.8 percentage points higher than 2016. Onshore wind now has the largest capacity, marginally ahead of solar photovoltaics. The map on page 33 shows installed wind capacity for onshore and offshore sites across the UK.

# RENEWABLES

## UK Onshore and Offshore Wind Capacity



**UK progress against 2009 EU Renewable Energy Directive**



**Progress against the 2009 Renewable Energy Directive**

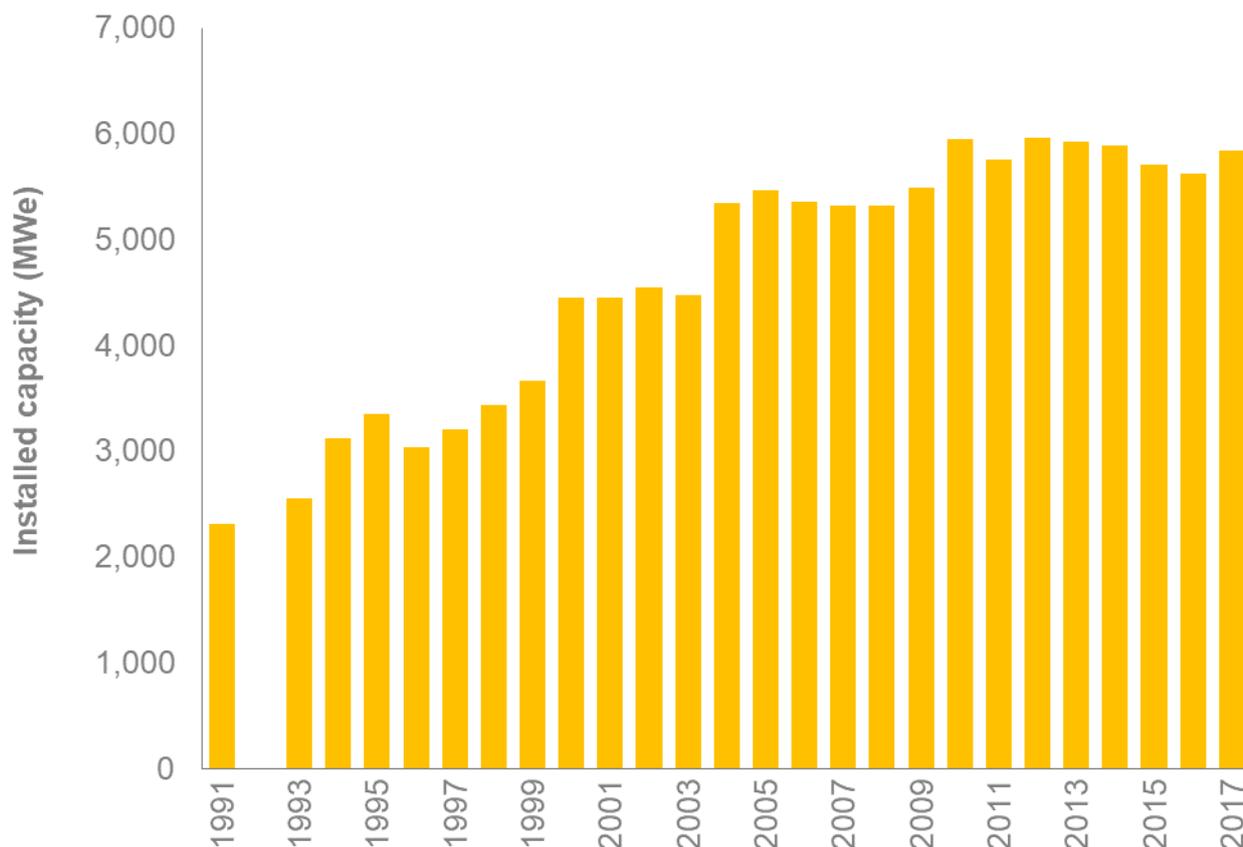
	2013	2014	2015	2016	2017
Percentage of electricity from renewable sources	13.8%	17.8%	22.1%	24.4%	27.9%
Percentage of heating and cooling from renewable sources	4.0%	4.7%	5.5%	6.3%	7.7%
Percentage of transport energy from renewable sources	4.7%	5.3%	4.4%	4.8%	4.6%
Overall renewable consumption as a percentage of capped gross final energy consumption using net calorific values	5.7%	7.2%	8.4%	9.2%	10.2%

In March 2007, the European Council agreed to a common strategy for energy security and tackling climate change. It set a target of 20% of the EU's energy to come from renewable sources. In 2009 a new Renewable Energy Directive was implemented and resulted in agreement of country "shares" of this target. For the UK, by 2020, 15% of **final energy consumption** - calculated on a net calorific basis, and with an air transport fuel cap - should be accounted for by energy from renewable sources.

In 2017 10.2% of final energy consumption was from renewable sources; this is up from 9.2% in 2016.

## COMBINED HEAT AND POWER

### Combined heat and power, 1991 to 2017

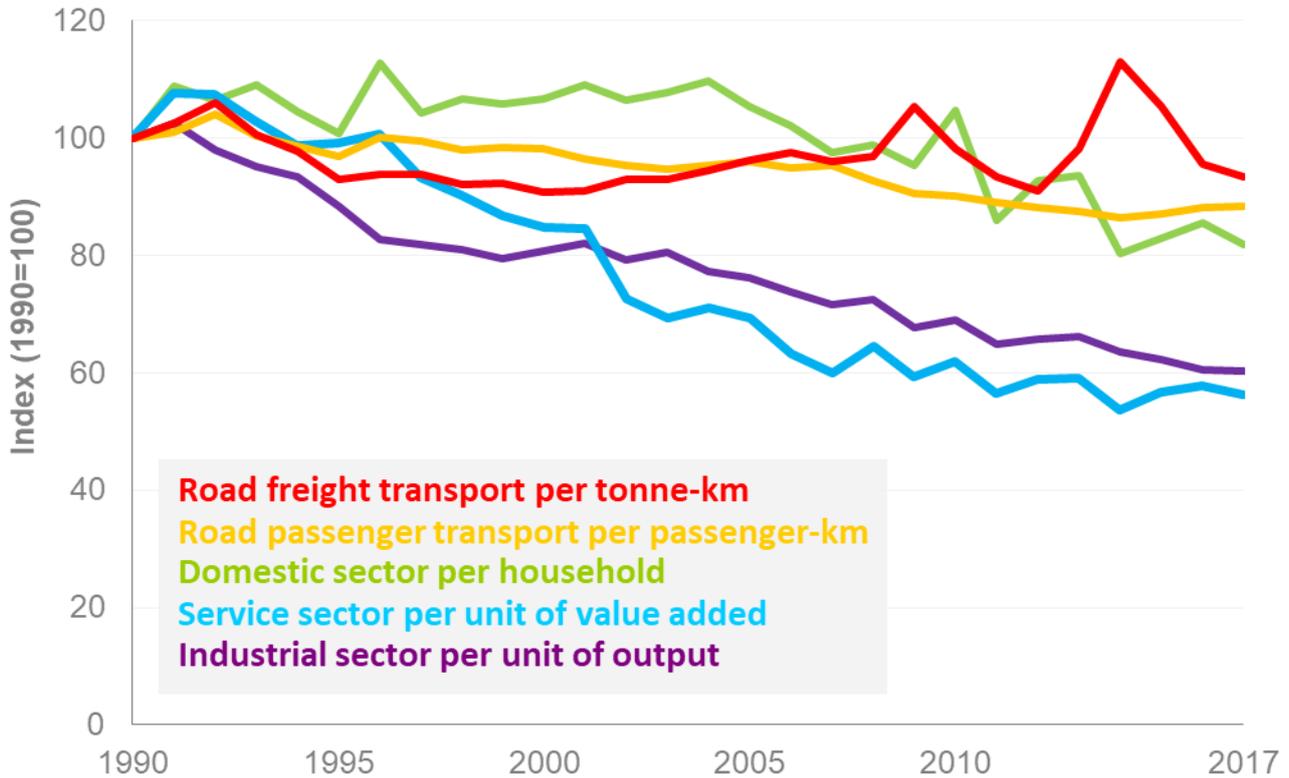


	1995	2000	2010	2016	2017
CHP electrical capacity (MWe)	3,354	4,451	5,950	5,625	5,835
CHP electrical generation (GWh)	14,778	25,245	26,768	20,405	21,648
CHP heat generation (GWh)	56,833	54,877	48,267	40,670	42,238
Number of CHP sites					
<= 100 kWe	620	560	405	642	669
> 100 kWe to 1 MWe	397	533	763	1183	1239
>1 MWe to 2 MWe	26	41	83	151	183
> 2 MWe to 10 MWe	113	141	138	180	228
> 10 MWe +	63	64	66	68	67
<b>Total</b>	<b>1,219</b>	<b>1,339</b>	<b>1,455</b>	<b>2,224</b>	<b>2,386</b>

In 2017 CHP electrical capacity increased by 3.7% compared to 2016 along with an increase in the total number of schemes. Electricity generation in 2017 was 6.1% higher than in 2016, while heat generation was 3.9% higher. Schemes larger than 10 MWe represent 72% of the total electrical capacity of CHP schemes whereas schemes less than 1MWe constitute the majority (80%) of the number of schemes. In 2017 CHP schemes accounted for 6.4% of the total electricity generated in the UK and 7.6% of UK gas demand.

## ENERGY EFFICIENCY

### Energy intensity, 1990 to 2017



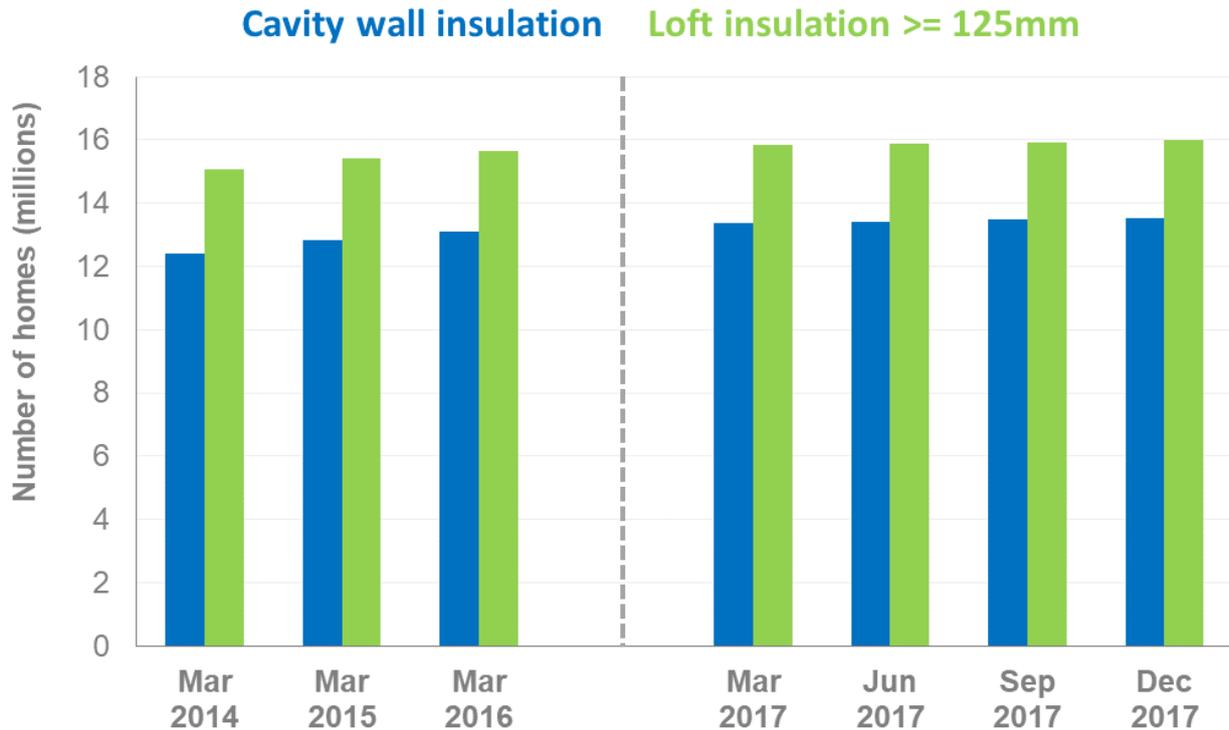
	Tonnes of oil equivalent				
	1990	2000	2010	2016	2017p
Industrial energy consumption per million units of GVA	164.5	133.0	113.3	99.5	99.2
Domestic energy consumption per household	1.8	1.9	1.9	1.5	1.5
Service sector energy consumption per million units of GVA	28.0	23.7	17.3	16.2	15.7
Road passenger energy consumption per million passenger-kilometres*	42.7	41.9	38.4	37.6	37.6
Road freight energy consumption per million freight-kilometres*	83.2	75.5	81.6	79.4	77.6

\* BEIS estimates for 2017

Energy consumption per unit of output, known as energy intensity, gives a broad indication of how efficiently energy is being used over time. Changes in energy intensity occur for a number of reasons: process change, technological change and structural change (in the case of industry and the service sector) as well as efficiency change. The largest falls in energy intensity over the last thirty years or so have occurred in the industrial sector mainly due to structural change in the period before 2000, and in the service sector due to general energy efficiency improvements. Despite the fluctuation over the past few years, there has been a general downward trend in domestic consumption since 2005.

## ENERGY EFFICIENCY

### Number of homes with energy efficiency measures, March 2014 to December 2017



#### Insulated homes in Great Britain (Thousands)

	Mar 2014	Mar 2015	Mar 2016	Mar 2017	Dec 2017
Cavity wall insulation	12,400	12,810	13,100	13,360	13,540
Loft insulation >= 125mm	15,090	15,420	15,630	15,840	15,980

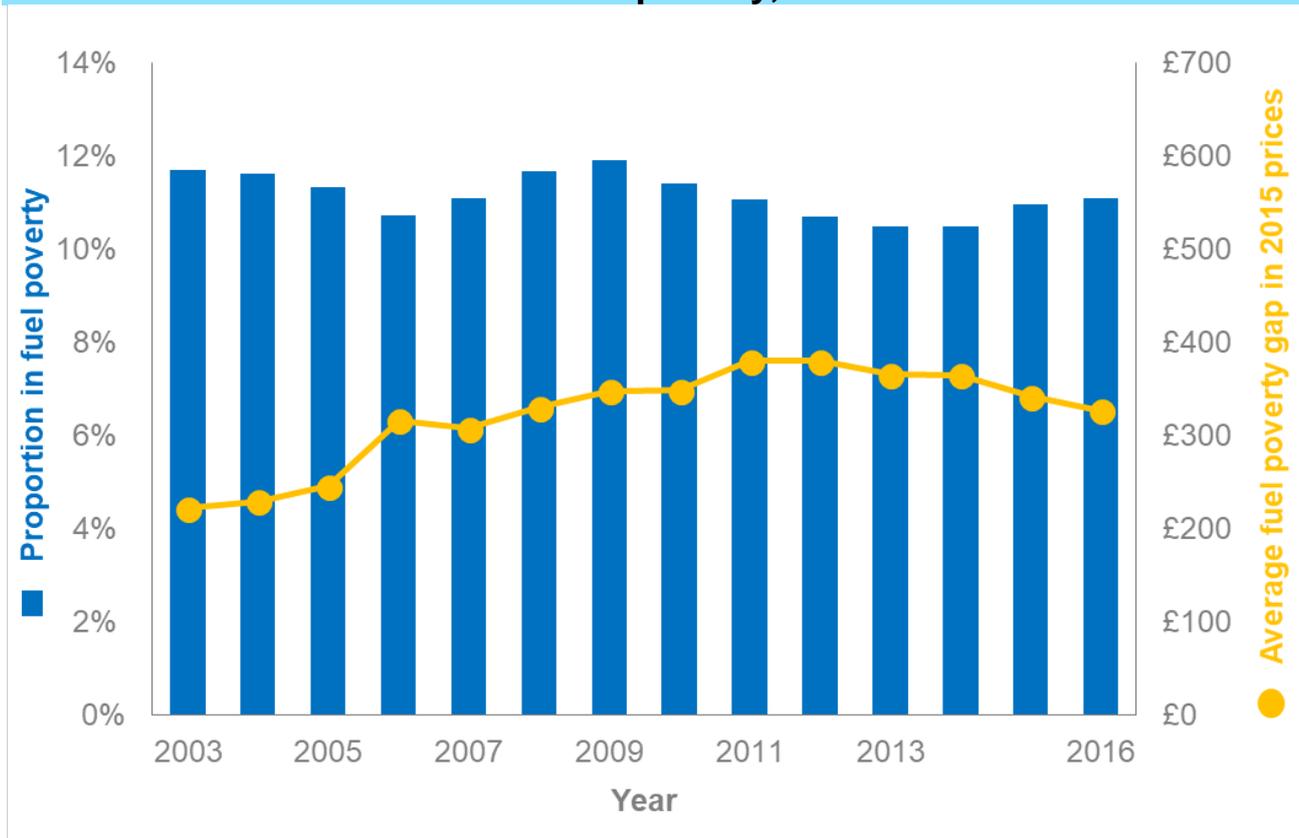
*Source: BEIS, Household Energy Efficiency (HEE) National Statistics, detailed report 2017. Estimates of insulation levels have been re-based to April 2013 to reflect more up to date information. Full details on how these estimates are constructed, based on the new methodology, can be found in the HEE statistics methodology note. Figures are rounded to the nearest ten thousand.*

Cost effective methods of improving energy efficiency in homes are to install cavity wall and loft insulation where these measures are practical. Building Regulations require new homes to reach thermal efficiency standards which would typically be met by installing these measures. In addition, existing homes have had these measures retrofitted through Government schemes or through a DIY loft insulation. These data show the change in the number of insulated homes as a result of new build and retro fitting insulation.

The number of homes with cavity wall insulation has increased by 9% between the end of March 2014 and December 2017 such that 13.5 million, of the 19.6 million homes with cavities, are insulated. The number of homes with loft insulation, of a depth of at least 125mm, has increased by 6% between the end of March 2014 and December 2017 meaning that 16.0 million of the 24.3 million homes with lofts are insulated to this level.

## FUEL POVERTY

### Households in fuel poverty, 2003 to 2016



A household is considered to be fuel poor if:

- they have required fuel costs that are above average (the national median level);
- were they to spend that amount, they would be left with a residual income below the official poverty line.

The Low Income High Costs fuel poverty measure for England is a dual indicator, which measures both:

- i) the **proportion** of households that have both *low* incomes and *high* fuel costs; and
- ii) the **depth** of fuel poverty among these fuel poor households. This is measured through a fuel poverty gap, which represents the difference between the required fuel costs for each household and the nearest fuel poverty threshold.

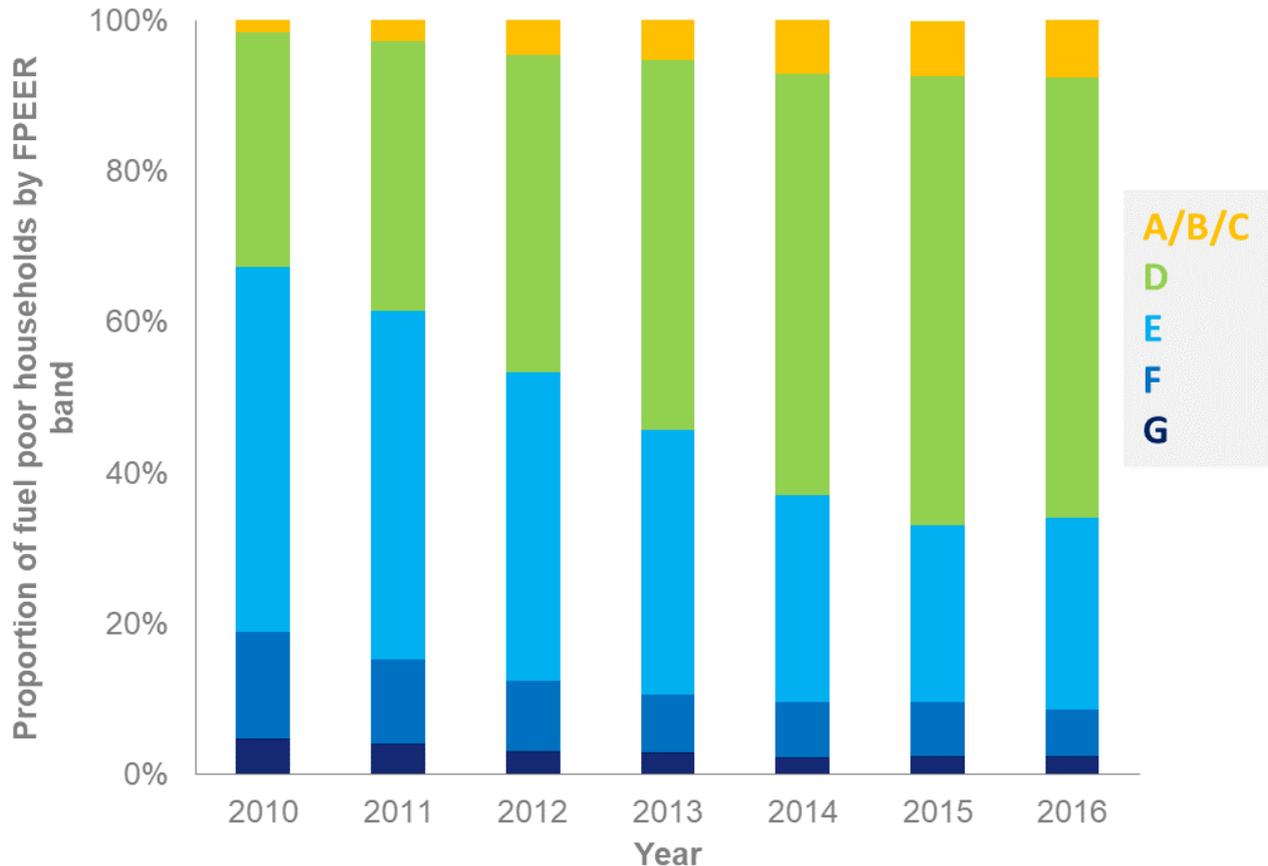
The fuel poverty indicator is a *relative* measure, as it compares households to national income thresholds and national median energy costs – thereby reflecting contemporary trends.

In 2016 the average fuel poverty gap (in real terms<sup>1</sup>) was £326. This is a decrease of around 4.4 per cent from 2015. The aggregate fuel poverty gap (summed across all households in fuel poverty) also decreased by 1.8 per cent in real terms to £832 million in 2016. The proportion of households in England in fuel poverty in 2016 was estimated at 11.1 per cent (approximately 2.55 million households). This is an increase of 0.1 percentage points from 2015).

<sup>1</sup> The average fuel poverty gap has been rebased to 2016 prices.

## FUEL POVERTY

### Fuel poor population by FPEER band, 2010 to 2016



The fuel poverty energy efficiency rating (FPEER) is a measure of the energy efficiency of a property based on the Standard Assessment Procedure (SAP)<sup>2</sup> but accounts for policies that directly affect the cost of energy. Similar to SAP, the FPEER methodology generates a rating between 1 and 100, which is then translated into an energy efficiency band from G (lowest) to A (highest) and underpins the Government's fuel poverty target<sup>3</sup>.

In December 2014 the Government introduced a new statutory fuel poverty target for England. The target is to ensure that as many fuel poor homes as reasonably practicable achieve a minimum energy efficiency rating of Band C by 2030 (with interim milestones to lift as many fuel poor homes in England as is reasonably practicable to Band E by 2020; and Band D by 2025).

The chart above looks specifically at the fuel poor population by FPEER bands between 2010 and 2016. This shows that the proportion of fuel poor households in Band C and above and Band D have increased over time (although the proportion in Band D fell slightly, by around 1 percentage point, between 2015 and 2016), while the proportion of fuel poor households in Bands F and G have decreased.

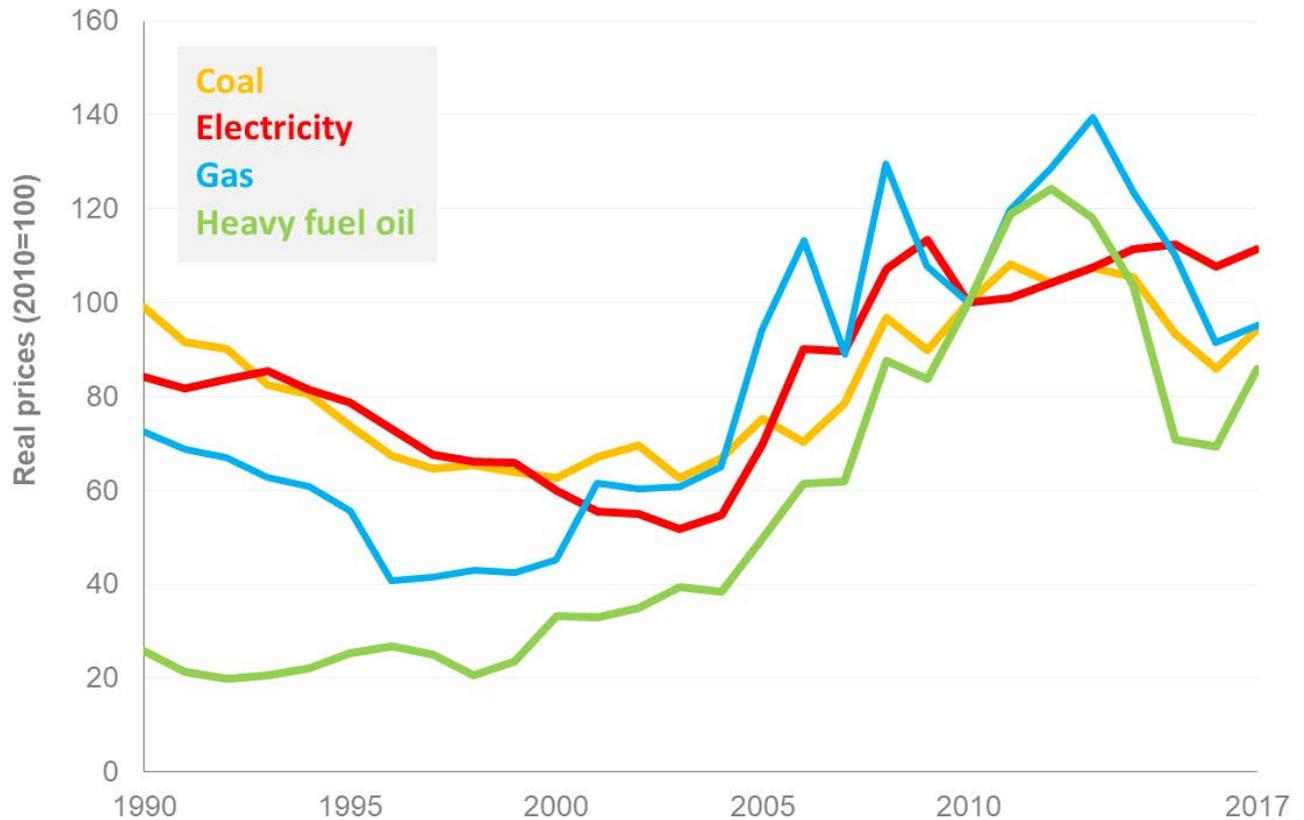
In 2016 91.3 per cent of fuel poor homes were in Band E or above; 65.9 per cent of fuel poor homes were in Band D or above; and 7.7 per cent of fuel poor households were in Band C or above.

<sup>2</sup>[www.gov.uk/guidance/standard-assessment-procedure](http://www.gov.uk/guidance/standard-assessment-procedure)

<sup>3</sup>[www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/408644/cutting\\_the\\_cost\\_of\\_keeping\\_warm.pdf](http://www.gov.uk/government/uploads/system/uploads/attachment_data/file/408644/cutting_the_cost_of_keeping_warm.pdf)

## PRICES

### Fuel price indices for the industrial sector, 1990 to 2017



	<b>Real prices, 2010 = 100</b>				
	<b>1990</b>	<b>2000</b>	<b>2010</b>	<b>2016</b>	<b>2017</b>
Coal	99.1	62.7	100.0	85.9	94.4
Electricity	84.1	60.0	100.0	107.6	111.3
Gas	72.4	45.4	100.0	91.5	95.1
Heavy fuel oil	25.9	33.3	100.0	69.4	85.9
<b>Industrial prices</b>	<b>74.4</b>	<b>51.9</b>	<b>100.0</b>	<b>98.6</b>	<b>104.4</b>

Includes the Climate Change Levy that came into effect in April 2001.

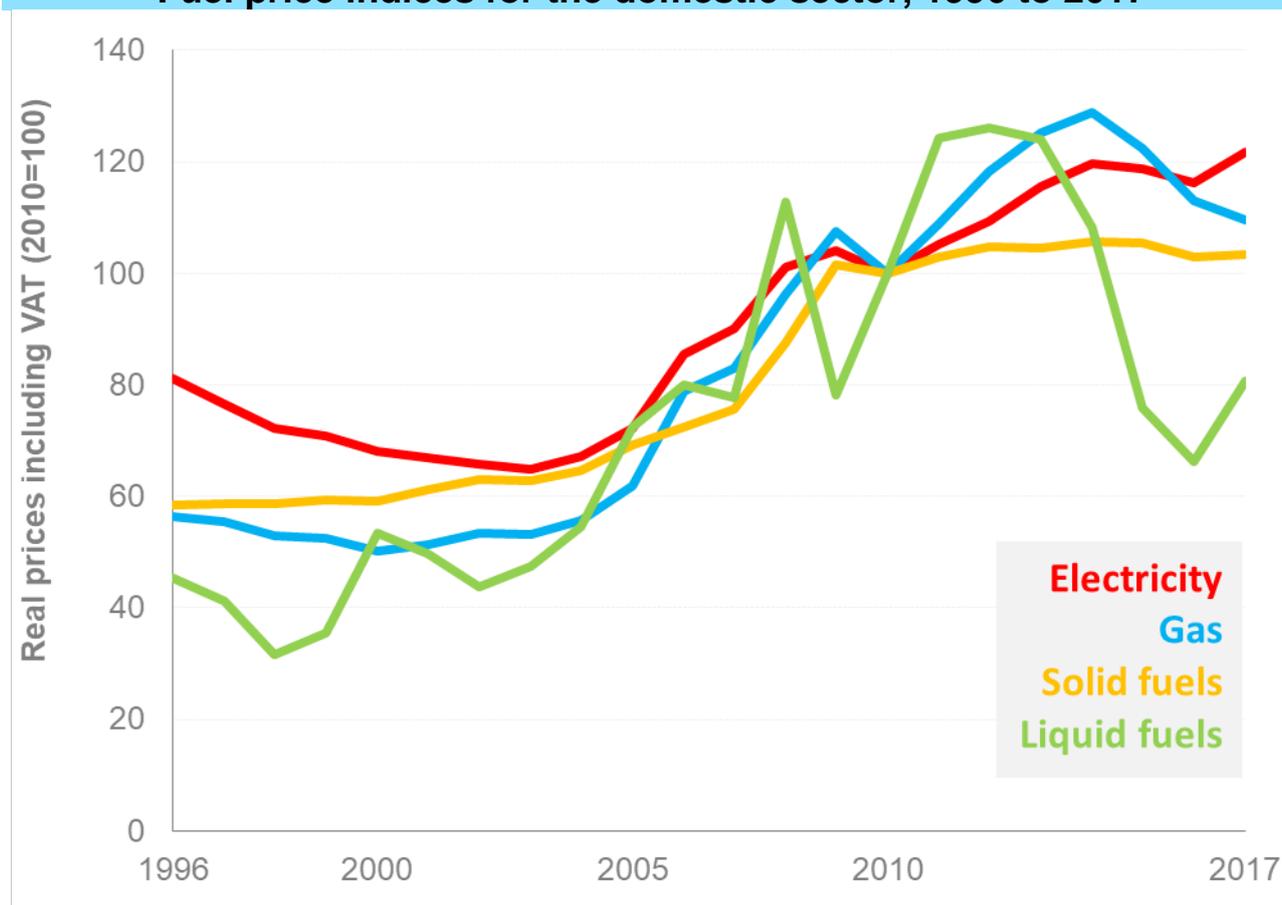
Industrial prices generally fell in the 90's and were at their lowest in aggregate levels in 2003. Industrial prices then rose again reaching a peak in 2013, after which prices have been on the decline. Industrial prices in 2017 rose by 5.9% in real terms on the previous year and were 9.9% lower than the peak in 2013 but slight more than twice the low seen in 2003.

Compared to the previous year, in 2017 prices for all fuels have increased, with electricity prices up by 3.5%, gas prices up by 4.0%, heavy fuel oil up by 24% and coal up by 9.9%. Over the last five years gas prices have decreased by 26% while electricity prices have increased by 6.8%.

Prices for most fuels are generally driven by changes to the price of crude oil. Brent prices, in dollar terms, increased from \$62/barrel (bbl) in 2009 to \$112/bbl in 2012, before falling back to \$44/bbl in 2016. In 2017, Brent prices rose to \$54.

## PRICES

### Fuel price indices for the domestic sector, 1996 to 2017



#### Real prices including VAT, 2010 = 100

	1996	2000	2005	2010	2016	2017
Solid fuels	58.5	59.1	69.3	100.0	103.0	103.4
Electricity	81.1	68.0	72.3	100.0	116.2	121.7
Gas	56.3	50.3	61.9	100.0	112.9	109.5
Liquid fuels	45.3	53.3	72.4	100.0	66.3	80.7
<b>Domestic fuels</b>	<b>67.1</b>	<b>59.6</b>	<b>68.0</b>	<b>100.0</b>	<b>113.3</b>	<b>115.4</b>

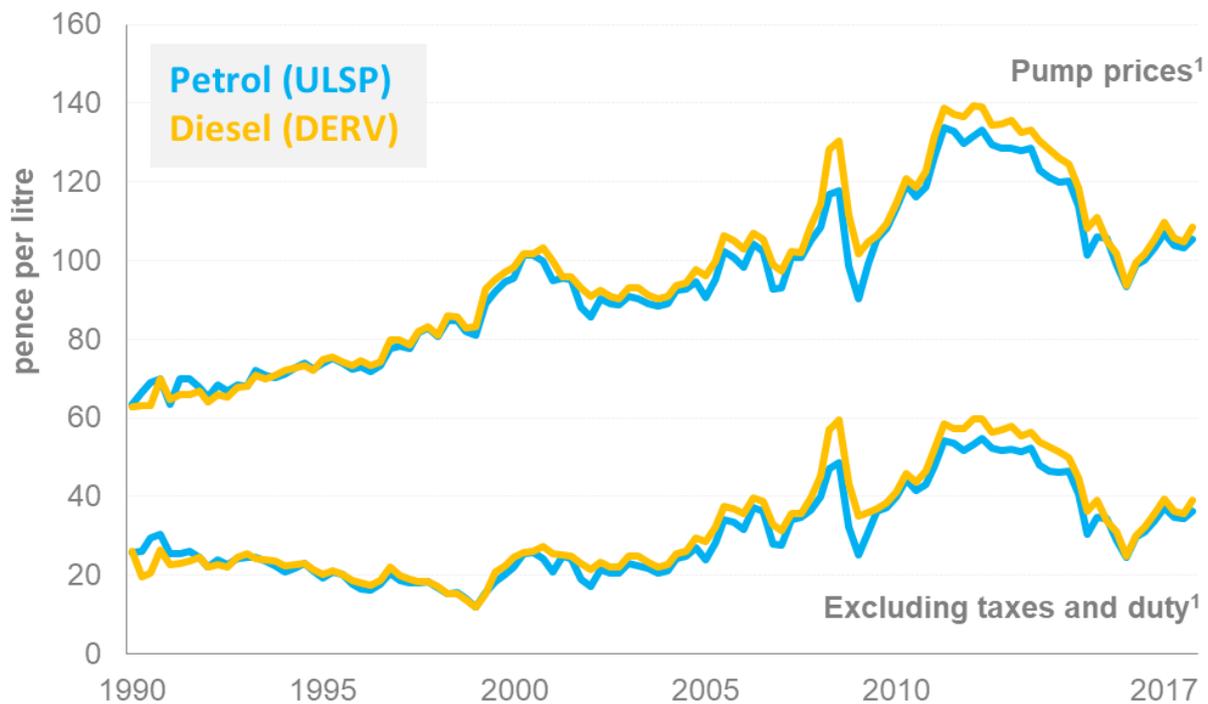
Source: Consumer Price Index, Office for National Statistics

Compared to 2016, total domestic energy prices in 2017 increased in real terms by 1.9%. Within the overall movement liquid fuels increased by 22%, gas prices decreased by 3.0%, and electricity prices increased by 4.7%. Between 2016 and 2017 crude oil prices rose by 23% to \$54 per barrel. This increase in the raw material prices was passed through to petroleum products produced from refining crude oil, leading to an increase in liquid fuel prices of 22%.

Between 2007 and 2017, real prices for domestic energy increased by 34%, with the real price of electricity increasing by 35% and the real price of gas increasing by 32%. Liquid fuel prices rose by 3.9% over this period but compared to the peak in 2012 liquid fuel prices were 36 per cent lower in 2017.

## PRICES

### Petrol and diesel prices, 1990 to 2017



<sup>1</sup> Deflated using GDP (market prices) deflator (2010 = 100)

#### Current retail prices

	Petrol (ULSP)	Pence/litre Diesel
1990	42.0	40.5
1995	53.8	54.2
2000	79.9	81.3
2005	86.8	90.9
2010	116.9	119.3
2015	111.1	114.9
2016	108.8	110.1
2017	117.6	120.1

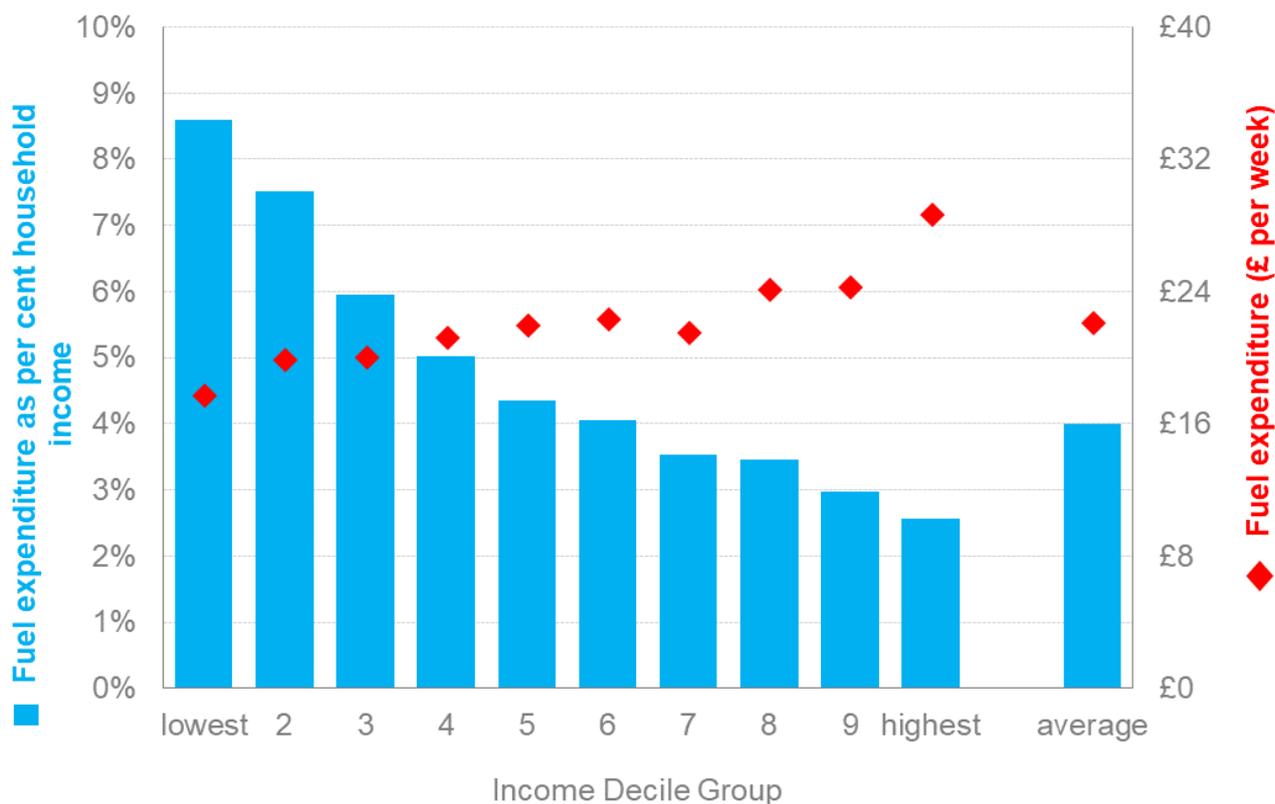
In cash terms the price of Ultra Low Sulphur Petrol (ULSP) cost 8.7 pence more in 2017 than in 2016, whilst diesel cost 10.0 pence per litre more. These increases reflect the prices of crude oil, which were above \$100 per barrel for most months between February 2011 and August 2014, before starting to fall to below \$50 per barrel in January 2015. Prices rose to around \$65 per barrel in May 2015 before falling back to a low of \$31 per barrel in January 2016, the lowest for over ten years. Crude oil prices have since been on the increase again. Average crude prices rose by 23% between 2016 and 2017.

In real terms the price of petrol was 6% higher in 2017 compared to 2016, whilst the price of diesel was 7% higher.

In 2016 taxes and duty accounted for 66% of the retail price of unleaded and 65% of the price of diesel.

## EXPENDITURE

### Fuel expenditure of households<sup>1</sup>, 2016/17



### Fuel expenditure as a percentage of total household expenditure, 1990 to 2016/17

Fuel type	1990	2000/01	2010	2015/16 <sup>4</sup>	2016/17
Gas	1.7%	1.2%	2.0%	2.0%	1.8%
Electricity	2.3%	1.6%	2.1%	2.2%	2.0%
Coal and Coke	0.3%	0.3%	0.4%	0.2%	0.2%
Heating oil	0.2%	0.3%	0.4%	0.2%	0.2%
<b>Total</b>	<b>4.5%</b>	<b>3.1%</b>	<b>4.5%</b>	<b>4.4%</b>	<b>4.0%</b>

Source: Living Costs and Food Survey 2016/17, Office for National Statistics

(1) Includes non-consuming households

Households in the lowest income decile group (i.e. the 10% of households with the lowest income) spend around 62% as much on domestic fuel per week compared to households in the highest income decile group (£18 compared to £29 per week). However, when comparing expenditure on domestic fuels as a proportion of total expenditure in 2016/17, those in the lowest income decile group spend considerably more (8.6%) than those in the highest income decile group (2.6%).

Across all income deciles households spent, on average, 4.0% of their total expenditure on fuel in 2016/17, a slight decrease on 2015/16 (4.4%).

<sup>4</sup> In 2015, ONS moved from calendar to fiscal year for reporting the Living Costs and Food survey data

## CONTACTS

### CONTACTS

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Foreign Trade Energy Intensity	Anwar Annut	0300 068 5060	<a href="mailto:Anwar.Annut@beis.gov.uk">Anwar.Annut@beis.gov.uk</a>
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## CONVERSION FACTORS AND DEFINITIONS

### CONVERSION FACTORS AND DEFINITIONS

To convert from the units on the left hand side to the units across the top multiply by the value in the table.

		<b>Thousand toe</b>	<b>TJ</b>	<b>GWh</b>	<b>Million therms</b>	
<i>from:</i>	<i>to:</i>	<b>Thousand toe</b>	1	41.868	11.630	0.39683
		<b>TJ</b>	0.023885	1	0.27778	0.0094778
		<b>GWh</b>	0.085985	3.6000	1	0.034121
		<b>Million therms</b>	2.5200	105.51	29.307	1

Data relating to the energy content of fuels are on a gross calorific value basis.

Prices are presented in real terms i.e. the effect of inflation has been removed by adjusting each series using the GDP deflator.

The symbol '-' is used in the tables where the figure is nil or not separately available, and '..' is used to indicate 'not available'.

The Department for Business, Energy and Industrial Strategy is the source of all data except where stated.

All data within this publication are classified as National Statistics.

All figures are for the United Kingdom, except for pages 37, 38 and 39.

## REFERENCES

The Department for Business, Energy and Industrial Strategy (BEIS) also produces the following energy and climate change statistics publications:

The **Digest of United Kingdom Energy Statistics** is the annual energy statistics publication of BEIS. With extensive tables, charts and commentary covering all the major aspects of energy, it provides a detailed and comprehensive picture of the last three years and a detailed picture for the last five years. It includes detailed information on the production and consumption of individual fuels and of energy as a whole. The 2018 edition, published on 26 July 2018, is available at:

[www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes](http://www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes)

The **Energy Flow Chart** is an annual publication illustrating the flow of primary fuels from home production and imports to their eventual final uses. They are shown in their original state and after being converted into different kinds of energy by the secondary fuel producers. The 2018 edition of the chart, published on 26 July 2018, shows the flows for 2017 and is available at: [www.gov.uk/government/collections/energy-flow-charts](http://www.gov.uk/government/collections/energy-flow-charts)

**Energy Trends** is a quarterly publication of statistics on energy in the United Kingdom. It includes tables, charts and commentary covering all major aspects of energy. It provides a comprehensive picture of energy production and use, to allow readers to monitor trends during the year. [www.gov.uk/government/collections/energy-trends](http://www.gov.uk/government/collections/energy-trends)

Monthly updates to tables in Energy Trends split by fuel source are also available.

**Energy Prices** is a quarterly publication that contains tables, charts and commentary covering energy prices, to domestic and industrial consumers, for all the major fuels. It also presents comparisons of fuel prices in the European Union and G7 countries. [www.gov.uk/government/collections/quarterly-energy-prices](http://www.gov.uk/government/collections/quarterly-energy-prices)

**Energy Consumption in the United Kingdom** brings together statistics from a variety of sources to produce a comprehensive review of energy consumption and changes in efficiency, intensity and output since the 1970s, with a particular focus on trends since 1990. The information is presented in five sections covering overall energy consumption and energy consumption in the transport, domestic, industrial and service sectors.

[www.gov.uk/government/collections/energy-consumption-in-the-uk](http://www.gov.uk/government/collections/energy-consumption-in-the-uk)

**Fuel Poverty statistics** are produced by BEIS to support the UK Fuel Poverty Strategy.

[www.gov.uk/government/collections/fuel-poverty-statistics](http://www.gov.uk/government/collections/fuel-poverty-statistics)

**UK Greenhouse Gas Emissions statistics** are produced by BEIS to show progress against the UK's goals, both international and domestic, for reducing greenhouse gas emissions. [www.gov.uk/government/collections/uk-greenhouse-gas-emissions-statistics](http://www.gov.uk/government/collections/uk-greenhouse-gas-emissions-statistics)

**Household Energy Efficiency statistics** are published by BEIS on the Energy Company Obligation (ECO) and Green Deal (GD). The headline release presents monthly updates of ECO measures and quarterly updates of in-depth ECO statistics, carbon savings and the Green Deal schemes. The detailed report presents annual updates on in-depth Green Deal statistics and insulation levels.

[www.gov.uk/government/collections/household-energy-efficiency-national-statistics](http://www.gov.uk/government/collections/household-energy-efficiency-national-statistics)

## REFERENCES

**Sub-National Energy Consumption statistics** are produced by BEIS to emphasise the importance of local and regional decision making for energy policy in delivering a number of national energy policy objectives.

[www.gov.uk/government/organisations/department-for-business-energy-and-industrial-strategy/about/statistics](http://www.gov.uk/government/organisations/department-for-business-energy-and-industrial-strategy/about/statistics)

BEIS has constructed a **National Energy Efficiency Data-framework (NEED)** to enable detailed statistical analysis of energy efficiency. The data framework matches the gas and electricity consumption data collected for BEIS sub-national energy consumption statistics and records of energy efficiency measures in the Homes Energy Efficiency Database (HEED) run by the Energy Saving Trust (EST), as well as typographic data about dwellings and households.

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





