Department for Business, Energy & Industrial Strategy

ENERGY TRENDS MARCH 2017

March 2017

This document is available in large print, audio and braille on request. Please email enquiries@beis.gov.uk with the version you require.

This is a National Statistics publication

The United Kingdom Statistics Authority has designated these statistics as National Statistics, in accordance with the Statistics and Registration Service Act 2007 and signifying compliance with the UK Statistics Authority: Code of Practice for Official Statistics.

Designation can be broadly interpreted to mean that the statistics:

- meet identified user needs
- are well explained and readily accessible
- are produced according to sound methods, and
- are managed impartially and objectively in the public interest

Once statistics have been designated as National Statistics it is a statutory requirement that the Code of Practice shall continue to be observed

Any enquiries regarding this publication should be sent to us at energy.stats@beis.gov.uk.

This publication is available for download at www.gov.uk/government/statistics/energy-trends-march-2017.

Contents

Introduction

Energy Trends and Energy Prices are produced by the Department for Business, Energy and Industrial Strategy (BEIS) on a quarterly basis. Both periodicals are published concurrently in June, September, December and March. The March editions cover the fourth quarter of the previous year and also the previous year as a whole.

Energy Trends includes information on energy as a whole and by individual fuels. The text and charts provide an analysis of the data in the tables. The tables are mainly in commodity balance format, as used in the annual Digest of UK Energy Statistics. The 2016 edition of the Digest was published on 28 July 2016 and is available on the BEIS section of the GOV.UK website at: www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes

The balance format shows the flow of a commodity from its sources of supply, through to its final use. The articles provide in-depth information on current issues within the energy sector.

The text and tables included in this publication represent a snapshot of the information available at the time of publication. However, the data collection systems operated by BEIS, which produce this information, are in constant operation. New data are continually received and revisions to historic data made. To ensure that those who use the statistics have access to the most up-to-date information, revised data will be made available as soon as possible, via the electronic versions of these tables. The electronic versions are available free of charge from the BEIS section of the GOV.UK website. In addition to quarterly tables, the main monthly tables that were published in the period up to May 2001 when Energy Trends was produced monthly, continue to be updated and are also available on the BEIS section of the GOV.UK website. Both sets of tables can be accessed at:
www.gov.uk/government/organisations/department-for-business-energy-and-industrial-strategy/about/statistics

Annual data for 2016 included within this edition is on a provisional basis. New data are continually received and revisions to previous data made. Finalised figures for 2016 will be published on the 27 July 2017 in the annual Digest of UK Energy Statistics.

Energy Trends does not contain information on Foreign Trade, Weather (temperature, wind speed, sun hours and rainfall) and Prices. However, Foreign Trade and Weather tables are available on the BEIS section of the GOV.UK website at: www.gov.uk/government/organisations/department-for-business-energy-and-industrial-strategy/about/statistics. Information on Prices can be found in the Energy Prices publication and on the BEIS section of the GOV.UK website at:
www.gov.uk/government/collections/quarterly-energy-prices

If you have any comments on Energy Trends or Energy Prices publications please send them to:

Kevin Harris
BEIS
Energy Statistics Team
1st Floor Abbey 1
1 Victoria Street
London SW1H 0ET
E-mail: Kevin.Harris@beis.gov.uk
Tel: 0300 068 5041

The main points for 2016:

- Total energy production was 1.2 per cent higher than in 2015. This increase, which follows an increase of 9.6 per cent between 2014 and 2015, was due to rises in output from oil, gas, bioenergy and nuclear. Coal output fell to a record low level, whilst output from wind, solar and natural flow hydro also fell.
- Imports in 2016 were 3.8 per cent lower than in 2015, whilst exports fell by 0,1 per cent. As a result, net import dependency fell back from 38.1 per cent to 35.6 per cent.
- Crude oil & NGL production was 4.8 per cent higher than in 2015, driven by new fields starting operation.
- Natural gas production was 3.6 per cent higher than in 2015, driven by less maintenance activity and the start up of the new large Laggan field. Gas exports were 23 per cent lower due to increased demand, whilst imports were 5.9 per cent higher; net imports rose 19.9 per cent on 2015.
- Coal production was 51 per cent lower than in 2015, and at a record low level, mainly due to the closure of a number of mines, including the closure of the last three remaining large deep mines in 2015 - Hatfield, Thoresby and Kellingley. Coal imports were 66 per cent lower as generators' demand for coal fell 59 per cent to a record low. Coal stocks fell and were 41 per cent lower, as a result of generators using more stocks for electricity generation while purchasing less coal from the UK and overseas.
- Total primary energy consumption for energy uses was 1.5 per cent lower than in 2015. However, when adjusted to take account of weather differences between 2015 and 2016, primary energy consumption fell by 2.5 per cent.
- Final energy consumption (excluding non-energy use) was 1.1 per cent higher than in 2015, with rises in the domestic, transport and services sectors but with a fall in the industrial sector. On a seasonally and temperature adjusted basis it is estimated to have risen by 0.6 per cent.
- Gas demand was 12.6 per cent higher than in 2015, driven by increased use of gas (instead of coal) in electricity generation, whilst electricity consumption was broadly unchanged.
- Electricity generation in 2016 fell by 0.2 per cent, from 339.1 TWh a year earlier to 338.6 TWh, with a large fall in generation from coal, offset by an increase from gas.
- Of electricity generated in 2016, gas accounted for 42.4 per cent (up 13 percentage points compared to 2015) and coal 9.1 per cent (a fall of 13 percentage points on 2015). Nuclear's share only increased by 0.4 percentage points on 2015 to 21.2 per cent of the total.
- Renewable electricity generation was 82.8 TWh in 2016, a decrease of 1.0 per cent on the 83.6 TWh in 2015, with bioenergy up by 0.7 per cent but wind generation down by 7.0 per cent. Renewables' share of electricity generation decreased by 0.2 percentage points on 2015 to 24.4 per cent. Renewable electricity capacity was 34.7 GWh at the end of 2016, a 13.7 per cent increase (4.2 GWh) on a year earlier.
- Low carbon electricity's share of generation increased from 45.4 per cent in 2015 to 45.6 per cent in 2016.
- Provisional estimates show that carbon dioxide emissions fell between 2015 and 2016 by 7 per cent; the key factor leading to this decrease was the switch in generation from coal to gas. A separate BEIS statistical release published at: www.gov.uk/government/statistics/provisional-uk-greenhouse-gas-emissions-national-statistics-2016 provides more detail.

The main points for the fourth quarter of 2016:

- Total energy production was 1.8 per cent lower when compared with the fourth quarter of 2015.
- Crude oil production fell by 7.2 per cent when compared with the fourth quarter of 2015, whilst NGL production rose by 28 per cent.
- Natural gas production was 3.3 per cent higher than the fourth quarter of 2015. Gas imports rose by 16.2 per cent, whilst exports fell by 52 per cent due to increased demand; net imports rose by 44 per cent compared to the fourth quarter of 2015.
- Coal production in the fourth quarter of 2016 was 26 per cent lower than the fourth quarter of 2015. Coal imports were 33 per cent lower as generators' demand for coal was down by 51 per cent.
- Total primary energy consumption for energy uses rose by 3.7 per cent. However, when adjusted to take account of weather differences between the fourth quarter of 2015 and the fourth quarter of 2016, primary energy consumption fell by 0.4 per cent.
- Temperatures in the quarter were on average 2.2 degrees colder than a year earlier, with average temperatures in November and December 2016 being noticeably colder than a year earlier.
- Final energy consumption (excluding non-energy use) was 6.8 per cent higher than in the fourth quarter of 2015. Domestic consumption rose by 18.0 per cent driven by the colder weather in November and December 2016. On a seasonally and temperature adjusted basis final energy consumption rose by 0.6 per cent.
- Gas demand was 25 per cent higher than the fourth quarter of 2015, driven by increased use of gas (instead of coal) in electricity generation, whilst electricity consumption was 3.3 per cent higher than in the fourth quarter of 2015, reflecting the colder weather in the fourth quarter of 2016.
- Electricity generated in the fourth quarter of 2016 increased by 4.9 per cent, from 88.4 TWh a year earlier to 92.8 TWh.
- Of electricity generated in the fourth quarter of 2016, gas accounted for 45.2 per cent, whilst coal accounted for 9.3 per cent. Nuclear generation accounted for 20.3 per cent of total electricity generated in the fourth quarter of 2016.
- Renewables' share of electricity generation decreased from 26.8 per cent in the fourth quarter of 2015 to a 22.2 per cent in the fourth quarter of 2016. This was mainly due to a fall of 2.7 knots in average wind speeds and a 54 per cent fall in rainfall compared to the fourth quarter of 2015.
- Low carbon electricity's share of generation decreased from 48.0 per cent in the fourth quarter of 2015 to 42.6 per cent in the fourth quarter of 2016, due to a large fall in renewables generation compared with 2015 Q4.

Section 1 - Total Energy

Key results show:

Provisional 2016

Total energy production was 1.2 per cent higher than in 2015. This increase, which follows an increase of 9.6 per cent between 2014 and 2015, was due to rises in output from oil, gas, bioenergy and nuclear. Coal output fell to a record low level, whilst output from wind, solar and natural flow hydro also fell. **(Chart 1.1**)

Total primary energy consumption for energy uses was 1.5 per cent lower than in 2015. However, when adjusted to take account of weather differences between 2015 and 2016, primary energy consumption fell by 2.5 per cent. **(Chart 1.3**)

Final energy consumption (excluding non-energy use) was 1.1 per cent higher than in 2015, with rises in the domestic, transport and services sectors but with a fall in the industrial sector. On a seasonally and temperature adjusted basis it is estimated to have risen by 0.6 per cent. (**Chart 1.5**)

Net import dependency was 35.6 per cent in 2016. Imports and exports both fell in 2016. Fossil fuel dependency was at a record low in 2016 at 81.5 per cent. (**Charts 1.6 & 1.7**)

Quarter 4 2016

Total energy production was 1.8 per cent lower than in the fourth quarter of 2015. (**Chart 1.2**)

Total primary energy consumption for energy uses rose by 3.7 per cent. However, when adjusted to take account of weather differences between the fourth quarter of 2015 and the fourth quarter of 2016, primary energy consumption fell by 0.4 per cent. **(Chart 1.3**)

Final consumption rose by 6.3 per cent compared to the fourth quarter of 2015, with the colder weather in November and December 2016 compared to a year earlier a significant factor, resulting in domestic consumption rising by 18.0 per cent. (**Chart 1.4**)

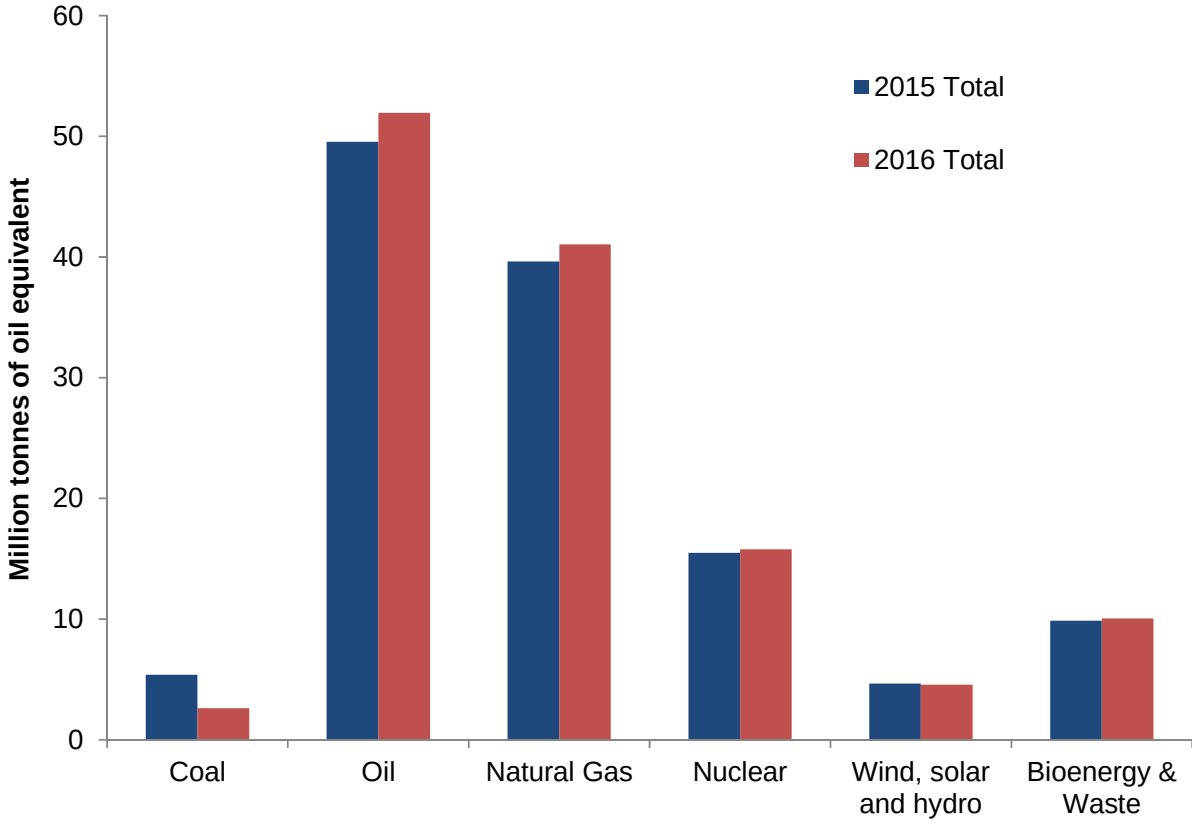
Relevant tables

Contacts for further information:

Iain MacLeay
Total energy statistics
Tel: 0300 068 5048
E-mail: Iain.MacLeay@beis.gov.uk

Kevin Harris
Total energy statistics
Tel: 0300 068 5041
E-mail: Kevin.Harris@beis.gov.uk

Chart 1.1 Production of indigenous primary fuels



Total production in 2016 was 126.0 million tonnes of oil equivalent, 1.2 per cent higher than in 2015. This increase, which follows an increase of 9.6 per cent between 2014 and 2015, was due to rises in output from oil, gas, bioenergy and nuclear which more than offset the decline in UK coal production and reduced output from wind, solar and hydro.

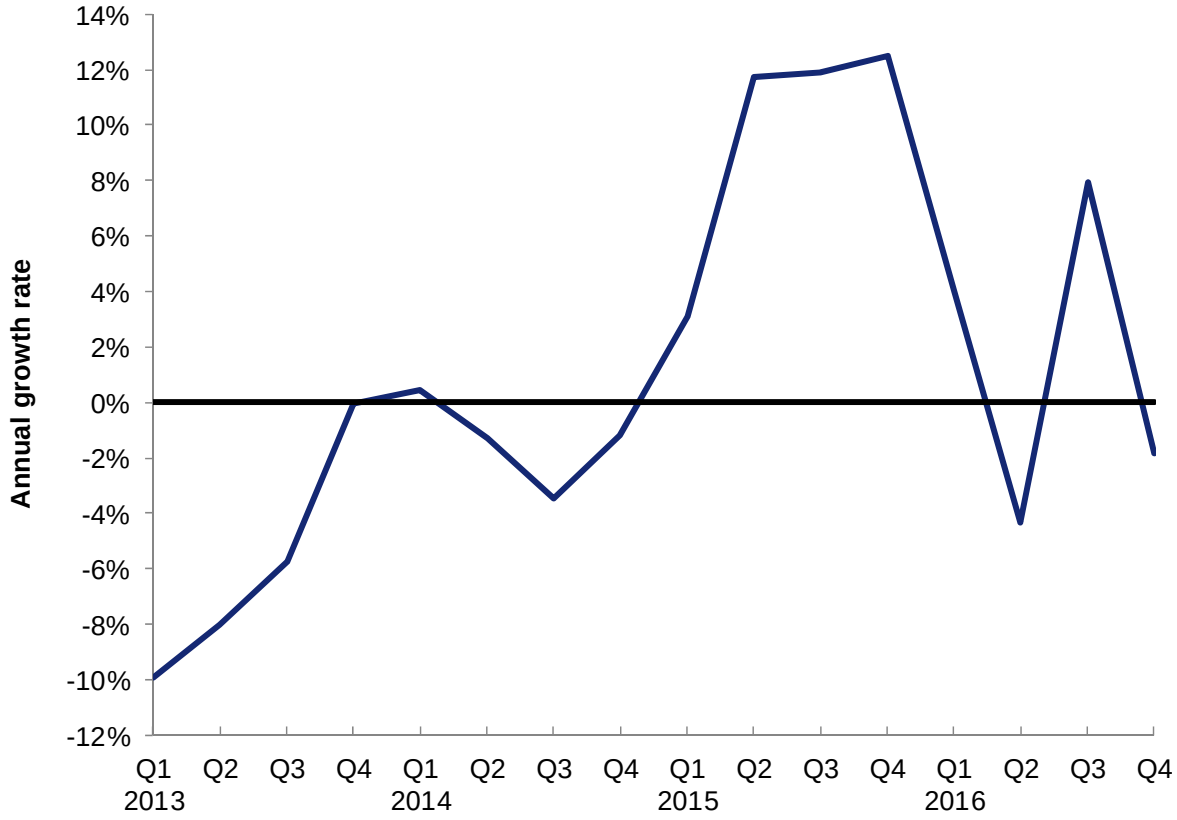
Production of oil rose by 4.9 per cent due to strong production from fields that feed into the Flotta and Forties terminals, whilst gas rose by 3.6 per cent due to the start-up of the new Laggan field and less maintenance activity than in 2015.

Production of bioenergy & waste rose by 2.0 per cent between 2015 and 2016.

Primary electricity output rose by 1.1 per cent between 2015 and 2016, within which nuclear output rose by 2.0 per cent due to improved availability following outages in 2015, whilst output from wind, solar and natural flow hydro fell by 1.8 per cent due to less favourable weather conditions for renewable generation in 2016.

Production of coal fell by 51 per cent, to a new record low, due to the closure of all large deep mines, and the remaining mines producing less coal as they come to the end of their operational life.

Chart 1.2 UK production (annual growth rate)



Total production in the fourth quarter of 2016 at 32.3 million tonnes of oil equivalent was 1.8 per cent lower than in the fourth quarter of 2015.

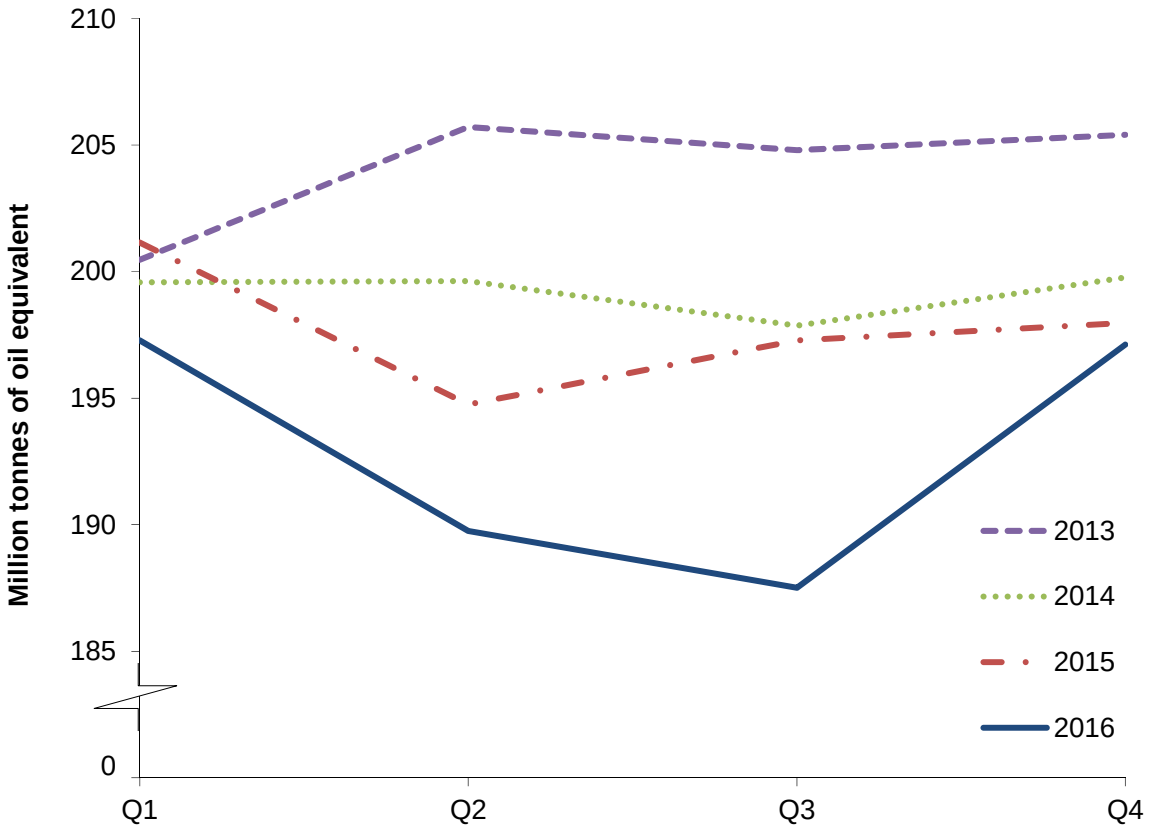
Production of oil fell by 5.0 per cent compared to the fourth quarter of 2015, despite strong growth in NGL output. Production of gas rose by 3.3 per cent compared to the fourth quarter of 2015, boosted by production from the new Laggan field.

Primary electricity output in the fourth quarter of 2016 was 2.9 per cent lower than in the fourth quarter of 2015, within which nuclear electricity output was 1.0 per cent higher following outages in 2015, whilst output from wind, solar and natural flow hydro was 14.9 per cent lower due to less favourable weather conditions for renewable generation, particularly wind generation.

Production of bioenergy and waste was 5.3 per cent higher compared to the fourth quarter in 2015.

In the fourth quarter of 2016 production of coal and other solid fuels was 26 per cent lower than the corresponding period of 2015. This was mainly due to the last deep mine in operation at Kellingley in North Yorkshire closing in December 2015.

Chart 1.3 Total inland consumption (primary fuel input basis) [(1)]



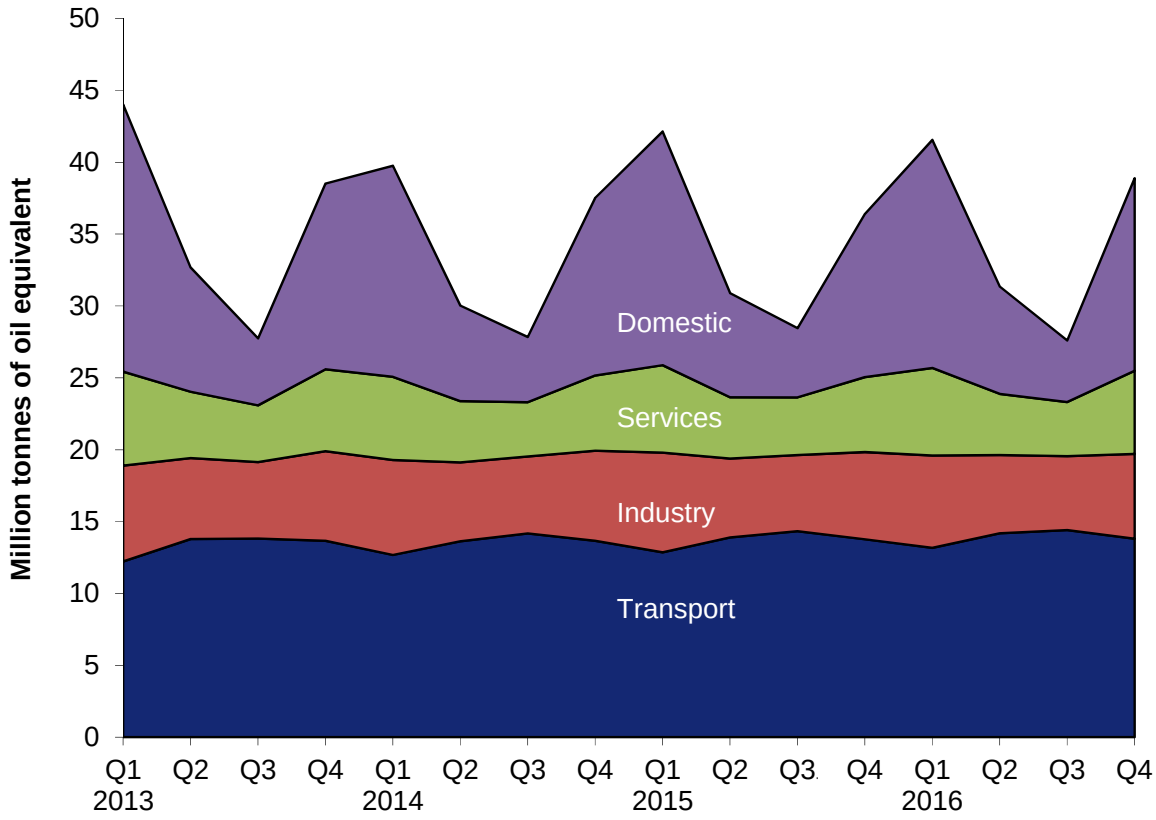
Total inland consumption on a primary fuel input basis (temperature corrected, seasonally adjusted annualised rate), was 192.9 million tonnes of oil equivalent in 2016, a fall of 2.5 per cent from 2015. On an unadjusted basis, consumption was down 1.5 per cent. The average temperature in 2016 was broadly similar to 2015, but BEIS estimate that the number of heating degree days increased by 3.8 per cent from 1,948 to 2,021.

Between 2015 and 2016 (on a seasonally adjusted and temperature corrected basis) oil consumption rose by 1.3 per cent, gas rose by 9.8 per cent due to increased use for electricity generation and bioenergy rose by 3.2 per cent. Primary electricity consumption fell by 0.3 per cent, whilst coal consumption fell by 51 per cent, to a record low, as less coal was used in electricity generation.

Total inland consumption on a primary fuel input basis (temperature corrected, seasonally adjusted annualised rate), was 197.1 million tonnes of oil equivalent in the fourth quarter of 2016, a fall of 0.4 per cent compared to the fourth quarter of 2015. On an unadjusted basis, consumption was up 3.7 per cent; average temperatures in the fourth quarter of 2016 were 7.8 degrees Celcius, 2.2 degrees lower than the same period a year earlier. In November 2016 the daily average temperature was 5.8 degrees Celcius, the coldest November since 2010, 3.6 degrees Celcius lower than November 2015, whilst in December 2016 the daily average temperature was 6.5 degrees Celcius, 3.0 degrees Celcius lower than December 2015.

Consumption of coal fell by 42 per cent on an unadjusted basis in the fourth quarter of 2016 compared to a year earlier, however gas consumption rose by 25 per cent. These changes in consumption levels reflect the switch from coal to gas, as the main source of electricity generation in 2016 (see section 5).

Chart 1.4 Final energy consumption by user



In 2016, total final consumption (including non-energy use) was 1.5 per cent higher than in 2015.

Total final energy consumption rose by 6.3 per cent between the fourth quarter of 2015 and the fourth quarter of 2016.

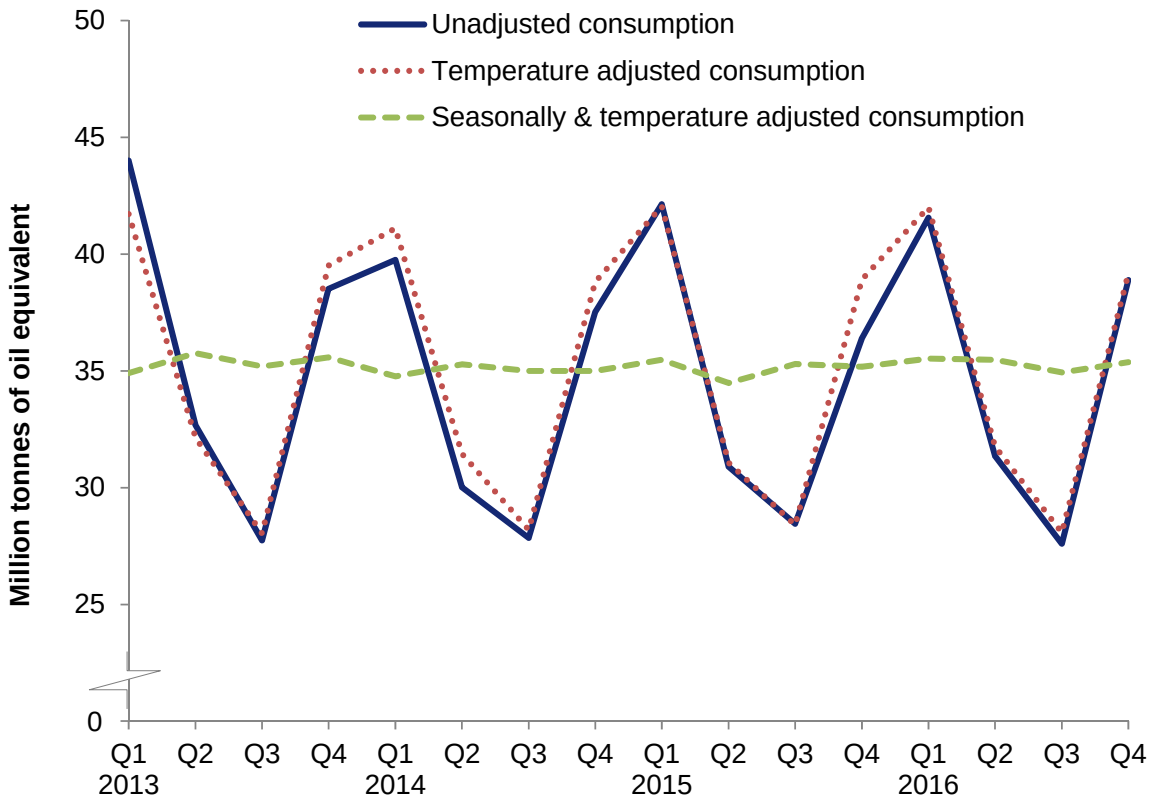
Domestic sector energy consumption rose by 18.0 per cent between the fourth quarter of 2015 and the fourth quarter of 2016 reflecting the colder weather in the quarter; annually it rose by 3.4 per cent.

Service sector energy consumption rose by 10.9 per cent between the fourth quarter of 2015 and the fourth quarter of 2016; annually it rose by 1.7 per cent.

Industrial sector energy consumption fell by 2.7 per cent between the fourth quarter of 2015 and the fourth quarter of 2016; annually it fell by 3.8 per cent.

Transport sector energy consumption rose by 0.3 per cent between the fourth quarter of 2015 and the fourth quarter of 2016; annually it rose by 1.3 per cent.

Chart 1.5 Seasonally adjusted and temperature corrected final energy consumption



Total unadjusted final energy consumption (excluding non-energy use) rose by 1.1 per cent between 2015 and 2016. On a seasonally and temperature adjusted basis final energy consumption (excluding non-energy use) is estimated to have risen by 0.6 per cent.

Total unadjusted final energy consumption (excluding non-energy use) rose by 6.8 per cent between the fourth quarter of 2015 and the fourth quarter of 2016.

On a seasonally and temperature adjusted basis final energy consumption (excluding non-energy use) is estimated to have increased by 0.6 per cent between the fourth quarter of 2015 and the fourth quarter of 2016.

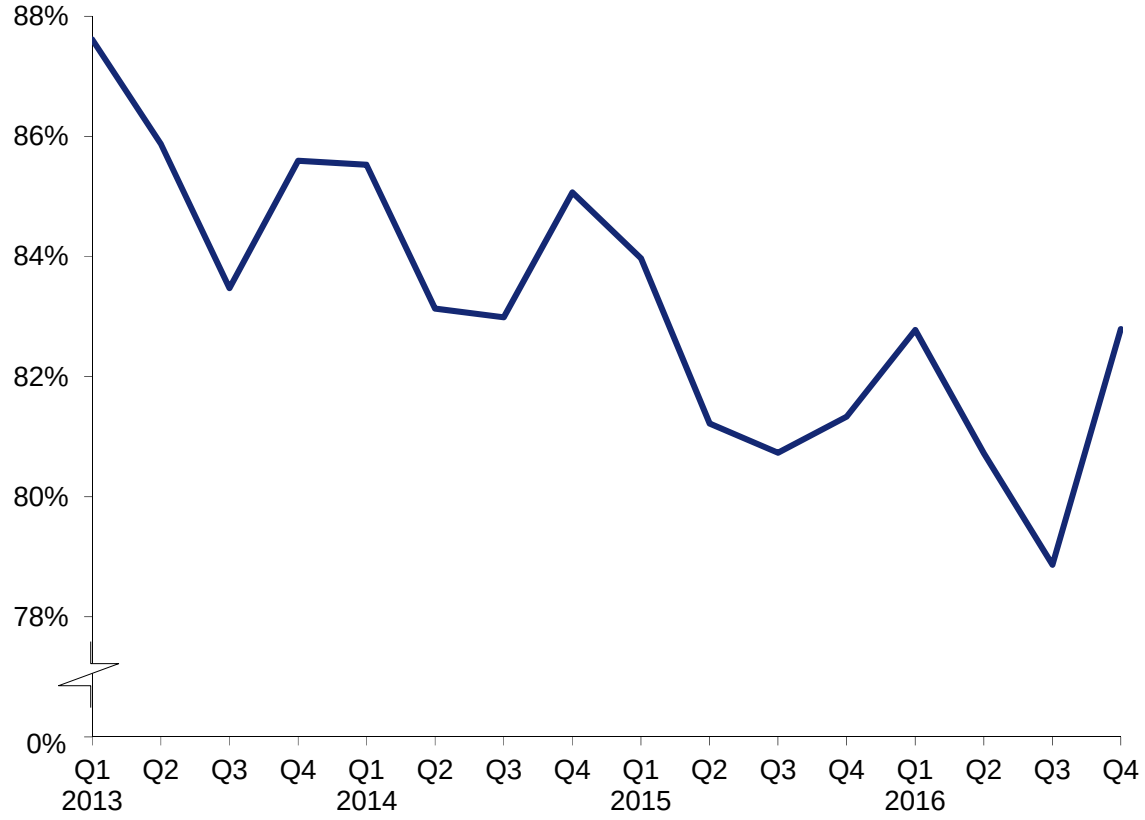
Consumption data by fuel and sector is available in table ET 1.3c which is now included within this publication as well as on the BEIS section of the GOV.UK website at:
www.gov.uk/government/statistics/total-energy-section-1-energy-trends

Chart 1.6 Net import dependency

Annually, total imports fell by 3.8 per cent to 149.1 million tonnes of oil equivalent, and exports fell by 0.1 per cent to 76.6 million tonnes of oil equivalent. As a result, net import dependency fell 2.5 percentage points from 2015 to 35.6 per cent.

In the fourth quarter of 2016, imports rose by 2.9 per cent, whilst exports fell by 9.8 per cent. As a result, net import dependency rose 4.3 percentage points from the fourth quarter of 2015 to 41.5 per cent.

Chart 1.7 Fossil fuel dependency



Dependency on fossil fuels in the fourth quarter of 2016 was 82.8 per cent, up 1.5 percentage points from the fourth quarter of 2015. Annually fossil fuel dependency was at a record low of 81.5 per cent, down 0.5 percentage points from 2015.

1 TOTAL ENERGY

TABLE 1.1. Indigenous production of primary fuels

Million tonnes of oil equivalent

		Total	Coal[1]	Petroleum[2]	Natural gas[3]	Bioenergy & waste[4,5]	Primary electricity	
							Nuclear	Wind, solar and hydro[6]
2012		122.6	10.6	48.8	38.9	6.8	15.2	2.28
2013		115.1	8.0	44.5	36.5	7.7	15.4	3.02
2014		113.6	7.3	43.7	36.8	8.3	13.9	3.60
2015		124.5	5.4	49.5	39.6	9.9	15.5	4.66
2016 p		126.0r	2.6r	52.0r	41.0r	10.1r	15.8	4.57r
Per cent change		*+1.2*	*-51.3*	*+4.9*	*+3.6*	*+2.0*	*+2.0*	*-1.8*
2015	Quarter 4	32.9	1.0	13.2	10.5	2.7	4.1	1.33
2016	Quarter 1	33.1r	0.6	13.8	10.5	3.1r	3.8	1.29r
	Quarter 2	30.8r	0.6	13.3r	9.9	2.3r	3.7	1.03r
	Quarter 3	29.8r	0.6	12.3r	9.7	1.8r	4.1	1.12r
	Quarter 4 p	32.3r	0.7r	12.6r	10.9r	2.8r	4.2	1.13r
Per cent change[7]		*-1.8*	*-26.3*	*-5.0*	*+3.3*	*+5.3*	*+1.0*	*-14.9*

1. Includes an estimate of slurry.
2. Crude oil, offshore and land, plus condensates and petroleum gases derived at onshore treatment plants.
3. Includes colliery methane, excludes gas flared or re-injected.
4. Includes solid renewable sources (wood, straw and waste), a small amount of renewable primary heat sources (solar, geothermal etc), liquid biofuels and sewage gas and landfill gas.
5. Bioenergy & waste introduced as a separate category from March 2014 - see special feature article in the March 2014 edition of Energy Trends at: www.gov.uk/government/collections/energy-trends-articles
6. Includes solar PV and natural flow hydro.
7. Percentage change between the most recent quarter and the same quarter a year earlier.

1 TOTAL ENERGY

TABLE 1.2 Inland energy consumption: primary fuel input basis

Million tonnes of oil equivalent

							Primary electricity								Primary electricity		
		Total	Coal[1]	Petroleum[2]	Natural gas[3]	Bioenergy & waste[4, 5]	Nuclear	Wind, solar and hydro[6]	Net imports	Total	Coal	Petroleum	Natural gas	Bioenergy & waste	Nuclear	Wind, solar and hydro	Net imports
		Unadjusted[7]								*Seasonally adjusted and temperature corrected*[8,9] *(annualised rates)*							
2012		208.0	40.9	67.0	73.3	8.3	15.2	2.28	1.02	207.9	40.9	67.0	73.3	8.3	15.2	2.28	1.02
2013		206.9	39.1	65.8	72.7	9.6	15.4	3.02	1.24	204.1	38.4	65.8	70.6	9.6	15.4	3.02	1.24
2014		193.9	31.6	65.8	66.1	11.2	13.9	3.60	1.76	199.2	33.2	65.8	69.9	11.2	13.9	3.60	1.76
2015		195.0r	25.1r	66.8r	67.9	13.2	15.5	4.66	1.80	197.8r	25.6r	66.8r	70.2	13.2	15.5	4.66	1.80
2016 p		192.0r	12.4r	67.7r	76.4r	13.6r	15.8	4.57r	1.51	192.9r	12.6r	67.7r	77.1r	13.6r	15.8	4.57r	1.51
Per cent change		*-1.5*	*-50.5*	*+1.3*	*+12.5*	*+3.2*	*+2.0*	*-1.8*	*-16.2*	*-2.5*	*-50.7*	*+1.3*	*+9.8*	*+3.2*	*+2.0*	*-1.8*	*-16.2*
2015	Quarter 4	50.9r	5.7r	17.0r	18.6	3.7	4.1	1.33	0.40	198.0r	21.2r	68.2r	71.3r	14.6	16.6r	4.48r	1.58
2016	Quarter 1	56.3r	4.9	16.6r	25.1	4.1r	3.8	1.29r	0.52	197.3r	16.5r	66.4r	76.8r	16.3r	14.9r	4.37r	2.06
	Quarter 2	43.7r	2.3r	16.9r	16.1	3.3r	3.7	1.03r	0.46	189.8r	11.7r	67.4r	76.3r	13.1r	14.8r	4.63r	1.84
	Quarter 3	39.3r	1.9r	17.2r	11.9	2.6r	4.1	1.12r	0.40	187.5r	10.4r	68.7r	74.0r	10.5r	16.8r	5.40r	1.61
	Quarter 4 p	52.8r	3.3r	17.1r	23.3r	3.7r	4.2	1.13r	0.13	197.1r	11.8r	68.3r	81.3r	14.7r	16.7r	3.89r	0.52
Per cent change[10]		*+3.7*	*-41.9*	*+0.1*	*+25.2*	*+0.1*	*+1.0*	*-14.9*	*-67.1*	*-0.4*	*-44.4*	*+0.1*	*+14.1*	*+0.1*	*+0.5*	*-13.1*	*-67.1*

1. Includes net foreign trade and stock changes in other solid fuels.
2. Inland deliveries for energy use, plus refinery fuel and losses, minus the differences between deliveries and actual consumption at power stations.
3. Includes gas used during production and colliery methane. Excludes gas flared or re-injected and non-energy use of gas.
4. Includes solid renewable sources (wood, straw and waste), a small amount of renewable primary heat sources (solar, geothermal, etc.), liquid biofuels, landfill gas and sewage gas.
5. Bioenergy & waste introduced as a separate category from March 2014 - see special feature article in the March 2014 edition of Energy Trends at:
www.gov.uk/government/collections/energy-trends-articles
6. Includes natural flow hydro, but excludes generation from pumped storage stations.
7. Not seasonally adjusted or temperature corrected.
8. Coal and natural gas are temperature corrected; petroleum, bioenergy and waste, and primary electricity are not temperature corrected.
9. For details of temperature correction see the June and September 2011 editions of Energy Trends; Seasonal and temperature adjustment factors were reassessed in June 2013
www.gov.uk/government/collections/energy-trends
10. Percentage change between the most recent quarter and the same quarter a year earlier.

1 TOTAL ENERGY

Table 1.3a Supply and use of fuels

Thousand tonnes of oil equivalent

	2015	2016 p	per cent change	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter	2016 2nd quarter	2016 3rd quarter	2016 4th quarter p	per cent change[1]
SUPPLY													
Indigenous production	124,547	126,026	*+1.2*	29,251	31,852	32,157	27,636	32,903	33,133r	30,765r	29,823r	32,305	*-1.8*
Imports	155,056r	149,141	*-3.8*	43,407	43,722r	35,301r	36,148r	39,885r	39,865r	35,169r	33,072r	41,036	*+2.9*
Exports	-76,667	-76,576	*-0.1*	-17,471	-16,955	-19,532	-20,270	-19,910	-19,545r	-18,339r	-20,742r	-17,950	*-9.8*
Marine bunkers	-2,593	-2,845	*+9.7*	-812	-564	-720	-725	-584	-574r	-777r	-816r	-677	*+15.8*
Stock change[2]	+2,873r	+5,189	*+80.6*	+72	+2,514r	-1,000r	+510r	+849r	+5,605r	-833r	+145r	+272	
Primary supply	203,216r	200,935	*-1.1*	54,448	60,569r	46,205r	43,300r	53,142r	58,484r	45,984r	41,480r	54,987	*+3.5*
Statistical difference[3]	332r	-120		-96	216r	19r	18r	78r	1r	-60r	-85r	24	
Primary demand	202,884r	201,055	*-0.9*	54,544	60,353r	46,186r	43,282r	53,064r	58,482r	46,044r	41,566r	54,963	*+3.6*
Transfers[4]	32r	-12		-2	-1r	2	35r	-4r	-4r	1r	-1r	-7	
TRANSFORMATION	-41,173r	-37,669	*-8.5*	-11,358	-12,081r	-9,591r	-9,067r	-10,434r	-10,620r	-8,685r	-8,358r	-10,005	*-4.1*
Electricity generation	-37,603	-34,367	*-8.6*	-10,286	-10,984	-8,629	-8,346	-9,644	-9,767r	-7,890r	-7,559r	-9,151	*-5.1*
Heat generation	-1,084	-1,084	-	-312	-350	-240	-207	-287	-350	-240	-207	-287	*+0.0*
Petroleum refineries	57r	-346	*(-)*	-111	-14r	0r	38r	34	-43r	-88r	-116r	-99	*(-)*
Coke manufacture	-156r	-81	*-48.0*	-86	-48	-46	-38	-24r	-20	-20	-21	-20	*-15.4*
Blast furnaces	-2,277r	-1,692	*-25.7*	-537	-665	-647	-485	-480r	-407	-425	-432	-428	*-10.8*
Patent fuel manufacture	-66r	-52	*-20.5*	-15	-10	-18	-17	-21r	-21	-11	-12r	-9	*-58.9*
Other[5]	-44	-46	*+3.8*	-11	-10	-9	-12	-12	-13r	-11r	-11r	-11	*-8.9*
Energy industry use	12,485	12,110	*-3.0*	2,975	3,197	3,115	3,056	3,118	3,170r	3,052r	2,796r	3,092	*-0.8*
Losses	3,147	2,967	*-5.7*	915	982	649	658	858	900r	687r	613r	767	*-10.6*
FINAL CONSUMPTION	146,111r	148,297	*+1.5*	39,289	44,082r	32,836r	30,543r	38,649r	43,778r	33,623r	29,805r	41,090	*+6.3*
Iron & steel	1,263	962	*-23.8*	317	369	343	291	260	249r	236r	237r	240	*-7.5*
Other industries	22,529r	21,930	*-2.7*	5,952	6,565r	5,145r	5,012r	5,807r	6,168r	5,199r	4,901r	5,663	*-2.5*
Transport	54,841r	55,572	*+1.3*	13,658	12,862r	13,889r	14,324r	13,766r	13,174r	14,188r	14,409r	13,802	*+0.3*
Domestic	39,675r	41,009	*+3.4*	12,361	16,260r	7,248r	4,815r	11,353r	15,868r	7,466r	4,281r	13,394	*+18.0*
Other Final Users	19,578r	19,909	*+1.7*	5,232	6,082r	4,270r	4,010r	5,215r	6,096r	4,260r	3,770r	5,783	*+10.9*
Non energy use	8,225r	8,914	*+8.4*	1,769	1,944r	1,942r	2,090r	2,248r	2,224r	2,275r	2,208r	2,207	*-1.8*
DEPENDENCY[6]													
Net import dependency	38.1%r	35.6%		46.9%	43.8%r	33.6%r	36.1%r	37.2%r	34.4%r	36.0%r	29.1%r	41.5%	
Fossil fuel dependency	82.0%	81.5%		85.1%	84.0%r	81.2%r	80.7%	81.3%r	82.8%r	80.7%r	78.9%r	82.8%	
Low carbon share	16.5%	17.1%		13.7%	14.8%r	17.1%r	17.3%	17.3%r	15.8%r	17.6%r	19.4%r	16.4%	

1. Percentage change between the most recent quarter and the same quarter a year earlier; (+) represents a positive percentage change greater than 100%.
2. Stock change + = stock draw, - = stock build.
3. Primary supply minus primary demand.
4. Annual transfers should ideally be zero. For manufactured fuels differences occur in the rescreening of coke to breeze.
   For oil and petroleum products differences arise due to small variations in the calorific values used.
5. Back-flows from the petrochemical industry - see article in the June 2016 edition of Energy Trends.
6. See article in the December 2010 edition of Energy Trends.

1 TOTAL ENERGY

Table 1.3b Supply and use of fuels

Thousand tonnes of oil equivalent

	2015 Quarter 4									2016 Quarter 4 p								
	Coal	Manufactured fuels[4]	Primary oil	Petroleum Products	Natural gas[5]	Bioenergy & waste[6]	Primary electricity	Electricity	Heat sold	Coal	Manufactured fuels[4]	Primary oil	Petroleum Products	Natural gas[5]	Bioenergy & waste[6]	Primary electricity	Electricity	Heat sold
SUPPLY																		
Indigenous production	1,013	-	13,230	-	10,523	2,693	5,444	-	-	746	-	12,564	-	10,873	2,837	5,286	-	-
Imports	2,678	231	14,729	8,647	12,089	1,074	-	437	-	1,882	282	14,558	9,076	14,049	950	-	240	-
Exports	-72	-6	-9,111	-7,036	-3,539	-106	-	-41	-	-96	-4	-9,489	-6,435	-1,695	-120	-	-110	-
Marine bunkers	-	-	-	-584	-	-	-	-	-	-	-	-	-677	-	-	-	-	-
Stock change[1]	+1,897	+3	-642	-63	-346	-	-	-	-	+623	-93	-186	-267	+194	-	-	-	-
Primary supply	5,515	229	18,207	965	18,726	3,661	5,444	395	-	3,155	185	17,447	1,698	23,420	3,667	5,286	130	-
Statistical difference[2]	+33	+1	-21	-40	+64	+1	-	+40	-	-31	-1	+21	-23	+76	-	-	-17	-
Primary demand	5,482	227	18,228	1,005	18,662	3,660	5,444	356	-	3,186	186	17,426	1,721	23,345	3,667	5,286	147	-
Transfers[3]	-	11	-545	+541	-11	-	-1,331	+1,331	-	-	+3	-545	+539	-4	-	-1,133	+1,133	-
TRANSFORMATION	-5,008	57	-17,683	17,503	-5,431	-2,346	-4,113	6,211	376	-2,802	62	-16,881	16,588	-7,738	-2,230	-4,153	6,774	376
Electricity generation	-4,249	-149	-	-165	-4,855	-2,324	-4,113	6,211	-	-2,090	-160	-	-153	-7,162	-2,208	-4,153	6,774	-
Heat generation	-36	-13	-	-16	-576	-22	-	-	376	-36	-13	-	-16	-576	-22	-	-	376
Petroleum refineries	-	-	-17,808	17,842	-	-	-	-	-	-	-	-16,998	16,899	-	-	-	-	-
Coke manufacture	-415	391	-	-	-	-	-	-	-	-361	341	-	-	-	-	-	-	-
Blast furnaces	-261	-219	-	-	-	-	-	-	-	-271	-157	-	-	-	-	-	-	-
Patent fuel manufacture	-47	47	-	-21	-	-	-	-	-	-44	51	-	-15	-	-	-	-	-
Other[7]	-	-	125	-137	-	-	-	-	-	-	-	117	-128	-	-	-	-	-
Energy industry use	-	129	-	1,130	1,233	-	-	559	68	-	105	-	1,078	1,294	-	-	547	68
Losses	-	28	-	-	182	-	-	648	-	-	18	-	-	154	-	-	594	-
FINAL CONSUMPTION	474	139	-	17,920	11,805	1,315	-	6,690	307	384	127	-	17,769	14,155	1,437	-	6,912	307
Iron & steel	7	81	-	1	95	-	-	75	-	7	66	-	0	91	-	-	76	-
Other industries	346	-	-	1,234	1,990	283	-	1,779	174	251	-	-	1,013	2,102	298	-	1,826	174
Transport	2	-	-	13,378	-	290	-	96	-	3	-	-	13,472	-	231	-	96	-
Domestic	116	45	-	720	7,271	604	-	2,582	15	119	48	-	794	9,006	748	-	2,664	15
Other final users	3	-	-	464	2,334	138	-	2,157	118	5	-	-	408	2,843	160	-	2,250	118
Non energy use	-	14	-	2,121	113	-	-	-	-	-	13	-	2,081	113	-	-	-	-

1. Stock fall +, stock rise -.
2. Primary supply minus primary demand.
3. Annual transfers should ideally be zero. For manufactured fuels differences occur in the rescreening of coke to breeze. For oil and petroleum products differences arise due to small variations in the calorific values used.
4. Includes all manufactured solid fuels, benzole, tars, coke oven gas and blast furnace gas.
5. Inludes colliery methane.
6. Includes geothermal, solar heat and biofuels for transport; wind and wave electricity included in primary electricity figures.
7. Back-flows from the petrochemical industry - see article in the June 2016 edition of Energy Trends.

1 Total Energy

Table 1.3c Seasonally adjusted and temperature corrected final energy consumption data[1]

Thousand tonnes of oil equivalent

	2015	2016 p	per cent change	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter	2016 2nd quarter	2016 3rd quarter	2016 4th quarter p	per cent change[2]
By consuming sector													
Final Consumption (unadjusted)													
Industry	23,792r	22,893	-3.8	6,269	6,934r	5,488r	5,303r	6,067r	6,417r	5,435r	5,138r	5,903	-2.7
Transport	54,841r	55,572	+1.3	13,658	12,862r	13,889r	14,324r	13,766r	13,174r	14,188r	14,409r	13,802	+0.3
Domestic	39,675r	41,009	+3.4	12,361	16,260r	7,248r	4,815r	11,353r	15,868r	7,466r	4,281r	13,394	+18.0
Other final users	19,578r	19,909	+1.7	5,232	6,082r	4,270r	4,010r	5,215r	6,096r	4,260r	3,770r	5,783	+10.9
Total	137,886r	139,383	+1.1	37,520	42,138r	30,895r	28,453r	36,401r	41,554r	31,349r	27,597r	38,883	+6.8
Final Consumption (Seasonally and temperature adjusted)													
Industry	23,610r	23,071	-2.3	5,908	6,177r	5,869r	5,925r	5,639r	5,728r	5,873r	5,770r	5,701	+1.1
Transport	54,817r	55,508	+1.3	13,582	13,550r	13,688r	13,783r	13,796r	13,923r	13,923r	13,842r	13,820	+0.2
Domestic	42,137r	42,486	+0.8	10,637	10,774r	10,050r	10,551r	10,762r	10,841r	10,728r	10,321r	10,596	-1.5
Other final users	19,848r	20,235	+1.9	4,871	4,967r	4,871r	5,034r	4,977r	5,027r	4,949r	5,002r	5,257	+5.6
Total	140,412r	141,300	+0.6	34,998	35,468r	34,479r	35,292r	35,173r	35,518r	35,474r	34,935r	35,373	+0.6
By fuel													
Final Consumption (unadjusted)													
Gas	41,707	43,053	+3.2	12,867	17,236	7,681	5,099	11,691	16,623r	7,980r	4,408r	14,041	+20.1
Electricity	26,032	26,048	+0.1	6,821	7,160	6,142	6,039	6,690	7,093r	6,081r	5,962r	6,912	+3.3
Other	70,147r	70,281	+0.2	17,833	17,742r	17,071r	17,315r	18,020r	17,838r	17,287r	17,227r	17,929	-0.5
Total	137,886r	139,383	+1.1	37,520	42,138r	30,895r	28,453r	36,401r	41,554r	31,349r	27,597r	38,883	+6.8
Final Consumption (Seasonally and temperature adjusted)													
Gas	43,954r	44,449	+1.1	11,133	11,297r	10,487r	11,159r	11,011r	11,146r	11,258r	10,753r	11,293	+2.6
Electricity	26,172r	26,148	-0.1	6,444	6,583r	6,577r	6,567r	6,445r	6,545r	6,519r	6,536r	6,549	+1.6
Other	70,286r	70,703	+0.6	17,421	17,588r	17,415r	17,566r	17,717r	17,828r	17,697r	17,647r	17,532	-1.0
Total	140,412r	141,300	+0.6	34,998	35,468r	34,479r	35,292r	35,173r	35,518r	35,474r	34,935r	35,373	+0.6

1. For methodology see articles in Energy Trends (June 2011 and September 2011 editions)
2. Percentage change between the most recent quarter and the same quarter a year earlier.

Section 2 – Solid Fuels and Derived Gases

Key results show:

Provisional 2016
Overall coal production in 2016 was 4.2 million tonnes, the lowest on record, and down 51 per cent (-4.4 million tonnes) compared to 2015. Deep-mined output was down 99 per cent (-2.8 million tonnes) and surface mined output down 29 per cent (-1.7 million tonnes) due to a number of mines closing and some other mines producing less coal as they are coming to the end of production. **(Chart 2.1)**

Coal imports were down 66 per cent (-15.9 million tonnes) on levels in 2015. This was the lowest value for 33 years **(Chart 2.1)**

The demand for coal by electricity generators in 2016, was 12.1 million tonnes (a new record low). This was 59 per cent (-17.1 million tonnes) lower than the demand in 2015. The decline was due to reduced coal-fired capacity due to the conversion of a third unit at Drax from coal to high-range co-firing (85% to <100% biomass) in July 2015 and an increase in the carbon price floor (from April 2015) which increased the price of coal-fired generation relative to gas-fired generation. **(Chart 2.3)**

Total stocks at the end of 2016 were 8.2 million tonnes (lowest value for at least 18 years), 41 per cent lower than at the end of 2015 (14.0 million tonnes). This was due to closure of coal-fired power plants and generators using held stock for electricity generation while purchasing less coal from the UK and overseas. **(Chart 2.4)**

Quarter 4 2016
In the fourth quarter of 2016, overall production was down 26 per cent (-0.4 million tonnes) compared to the fourth quarter of 2015 with deep-mined output down 99 per cent (-0.5 million tonnes) and surface-mined output up 6.8 per cent (+0.1 million tonnes). **(Chart 2.1)**

Coal imports were down 33 per cent (-1.3 million tonnes) on the levels in quarter 4 2015. **(Chart 2.1)**

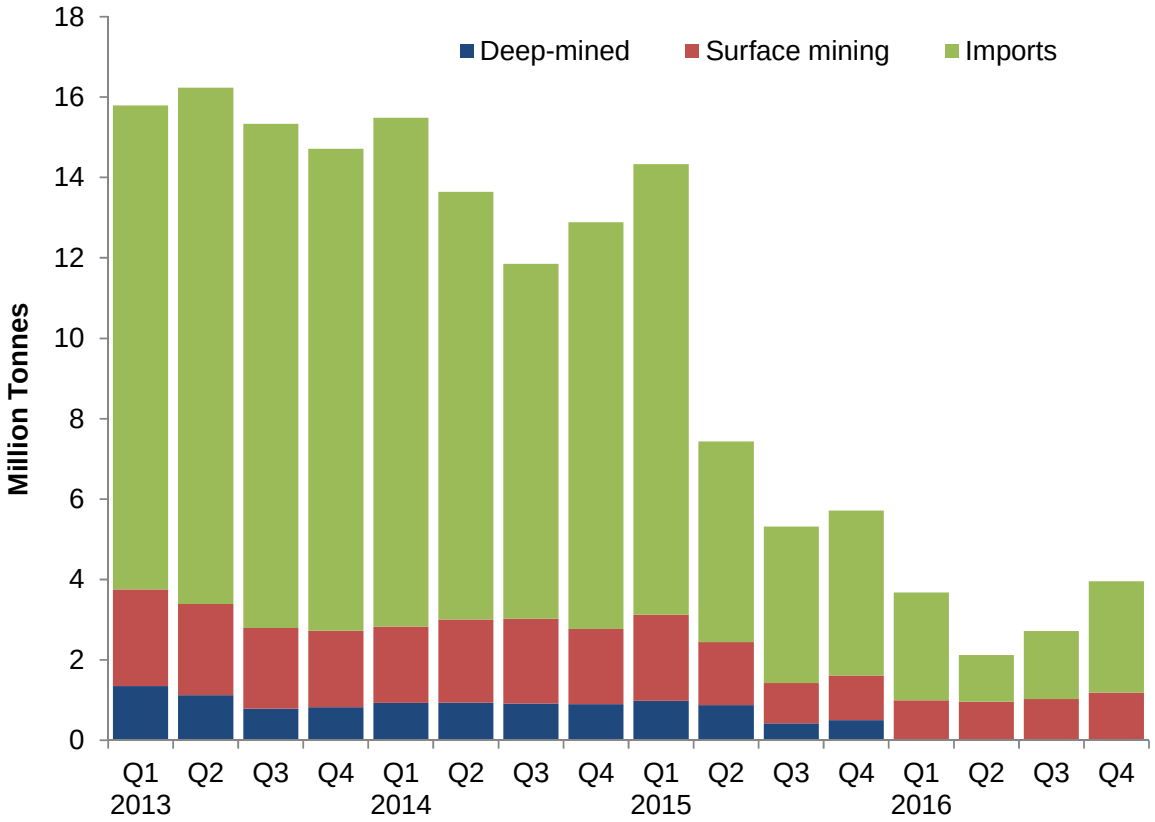
The demand for coal by electricity generators in the fourth quarter of 2016 was 51 per cent (-3.5 million tonnes) lower than demand in the fourth quarter of 2015, The decline was due to the closures of Ferrybridge C and Longannet in March 2016. The seasonal demand increase seen in November was maintained in December and was two and half times higher than in September, mainly due to an increase in overall electricity demand, along with a small increase in generation from Eggborough and Fiddlers Ferry coming back online as part of the Supplemental Balancing Reserve. **(Chart 2.3)**

Relevant tables

Contact for further information:

Chris Michaels
Coal statistics
Tel: 0300 068 5050
E-mail: coalstatistics@beis.gov.uk

Chart 2.1 Coal supply



Provisional figures for 2016, as a whole, show that coal production was 51 per cent down on 2015 at 4.2 million tonnes. Deep mined production fell 99 per cent to a new record low of 22 thousand tonnes due to the closure of the last three remaining large deep mines in 2015 - Hatfield, Thoresby and Kellingley. Surface mine production was down by 29 per cent at 4.2 million tonnes (also at a new record low).

Provisional figures for the fourth quarter of 2016 show that coal production fell to 1.2 million tonnes, down 26 per cent on the fourth quarter of 2015. However, compared to the third quarter of 2016 overall supply increased, responding to the seasonal increase in demand. This was mainly due to an increase in overall electricity demand in colder weather, along with a small increase in generation from Eggborough and Fiddlers Ferry coming back online as part of the Supplemental Balancing Reserve.

Imports of coal in 2016 as a whole were 66 per cent down on 2015 at 8.3 million tonnes. This was the lowest value for 33 years.

The decrease reflects the fact that consumption by electricity generators was down by 59 per cent to 12.1 million tonnes (a new record) in 2016.

Table 2A Coal imports by origin

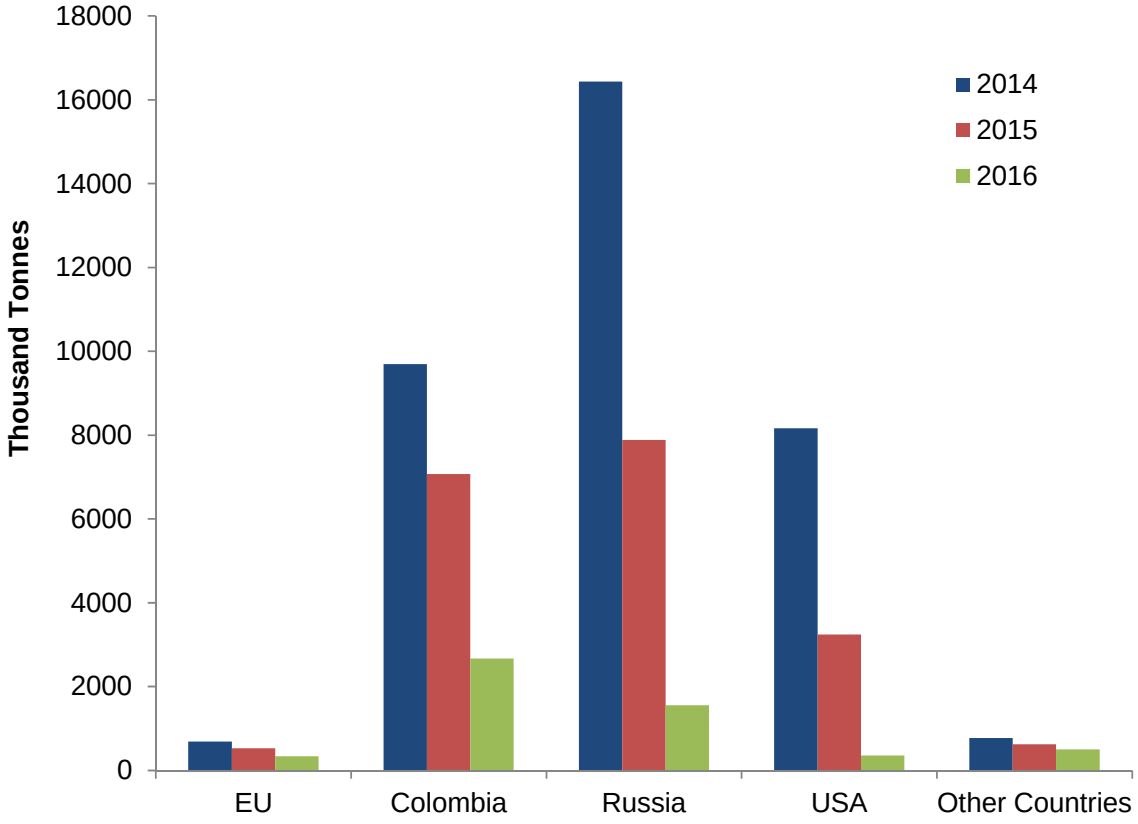
Thousand Tonnes

	2015	2016p	2015 Q4	2016 Q4p
European Union	614	439	167	102
Russia	9,187	2,292	1,079	585
Colombia	7,070	2,667	2,019	808
USA	5,317	1,406	469	678
Australia	910	778	188	443
Other Countries	1,101	712	182	150
Total Imports	**24,198**	**8,294**	**4,103**	**2,768**

Coal imports fell 66 per cent in 2016, to 8.3 million tonnes from 24.2 million tonnes in the previous year. Steam coal imports fell most, down by 72 per cent to 5.4 million tonnes, compared to coking coal imports which fell 41 per cent to 2.8 million tonnes. Steam coal accounted for 65 per cent of total coal imports in 2016 and coking coal accounted for 34 per cent of coal imports.

In the fourth quarter of 2016, total coal imports decreased by 33 per cent to 2.8 million tonnes. Colombia (29 per cent), the USA (25 per cent) and Russia (21 per cent) together accounted for 75 per cent of total coal imports. Steam coal imports in the fourth quarter of 2016 fell by 50 per cent to 1.8 million tonnes and accounted for 64 per cent of total coal imports. Coking coal imports in the fourth quarter of 2016 rose by 69 per cent to 1.0 million tonnes and accounted for 35 per cent of total coal imports. This was the highest quarter since Q2 2015.

Chart 2.2 Steam coal imports by origin



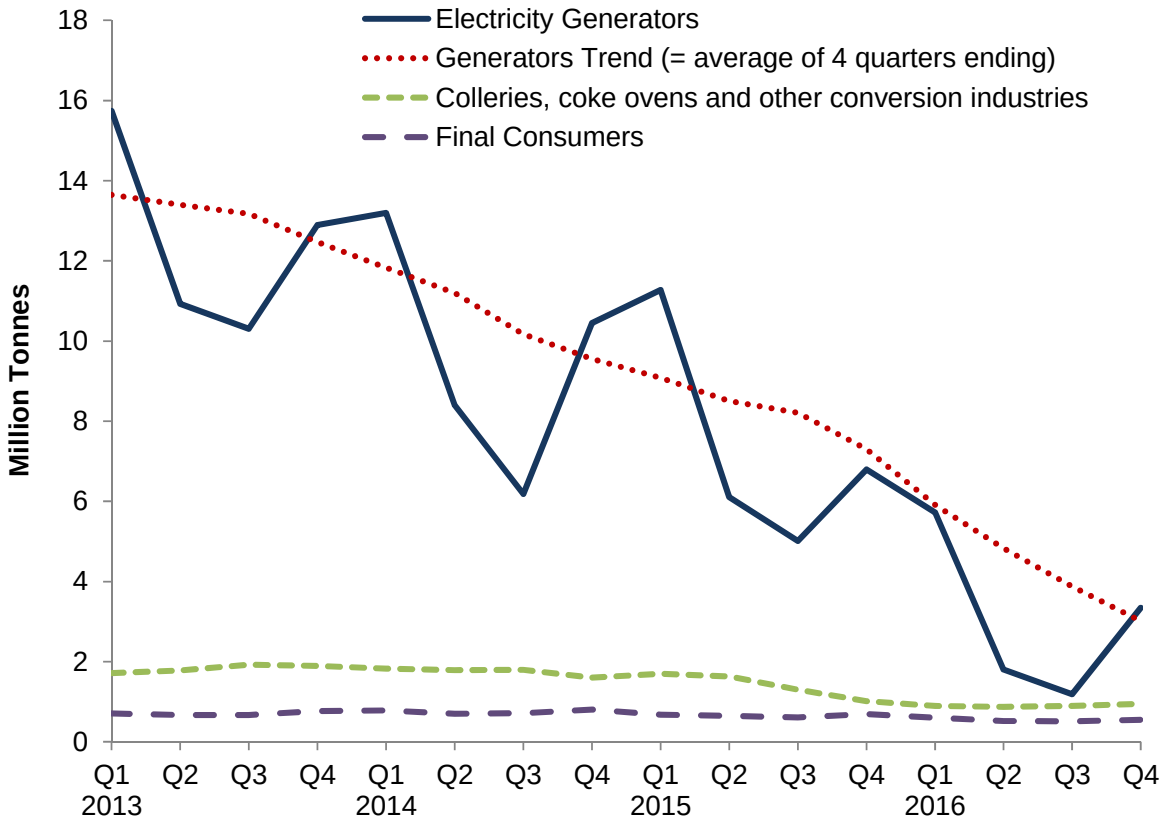
In 2016, 5.4 million tonnes of the coal imported (65 per cent) was steam coal, largely for the power stations market. Colombia (49 per cent) and Russia (29 per cent) in 2016 represented 78 per cent of steam coal imports. Kazakhstan overtook the USA and supplied 7.4 per cent of steam coal imports. The USA supplied 6.6 per cent.

Steam coal imports decreased from the USA 89 per cent (-2.9 million tonnes), Russia 80 per cent (-6.3 million tonnes), Colombia 62 per cent (-4.4 million tonnes) from 2015.

In the fourth quarter of 2016 all but 12 per cent of UK steam coal imports came from just three counties: Colombia (46 per cent), Russia (23 per cent) and the USA (19 per cent). Since the third quarter of 2015, Colombia has been the highest supplier of steam coal to the UK, overtaking Russia who was the highest supplier for ten years. Kazakhstan had been a major source of steam coal imports in the first two quarters, providing 23 per cent in the second quarter. By the fourth quarter Kazakhstan's share of steam coal imports had fallen to 5 per cent.

Steam coal imports were down by 50 per cent, with large falls recorded from the Colombia (60 per cent) and Russia (60 per cent).

Chart 2.3 Coal consumption



Total demand for coal in 2016 was 17.9 million tonnes, 52 per cent lower than in 2015, with consumption by electricity generators down by 59 per cent (-17.1 million tonnes) to a new record low of 12.1 million tonnes. The decline was due to reduced coal-fired capacity due to the conversion of a third unit at Drax from coal to high-range co-firing (85% to <100% biomass) in July 2015 and an increase in the carbon price floor, which made coal-fired generation more expensive relative to gas-fired generation (from April 2015). (from April 2015). Electricity generators accounted for 67 per cent of total coal use in 2016; compared with 78 per cent in 2015.

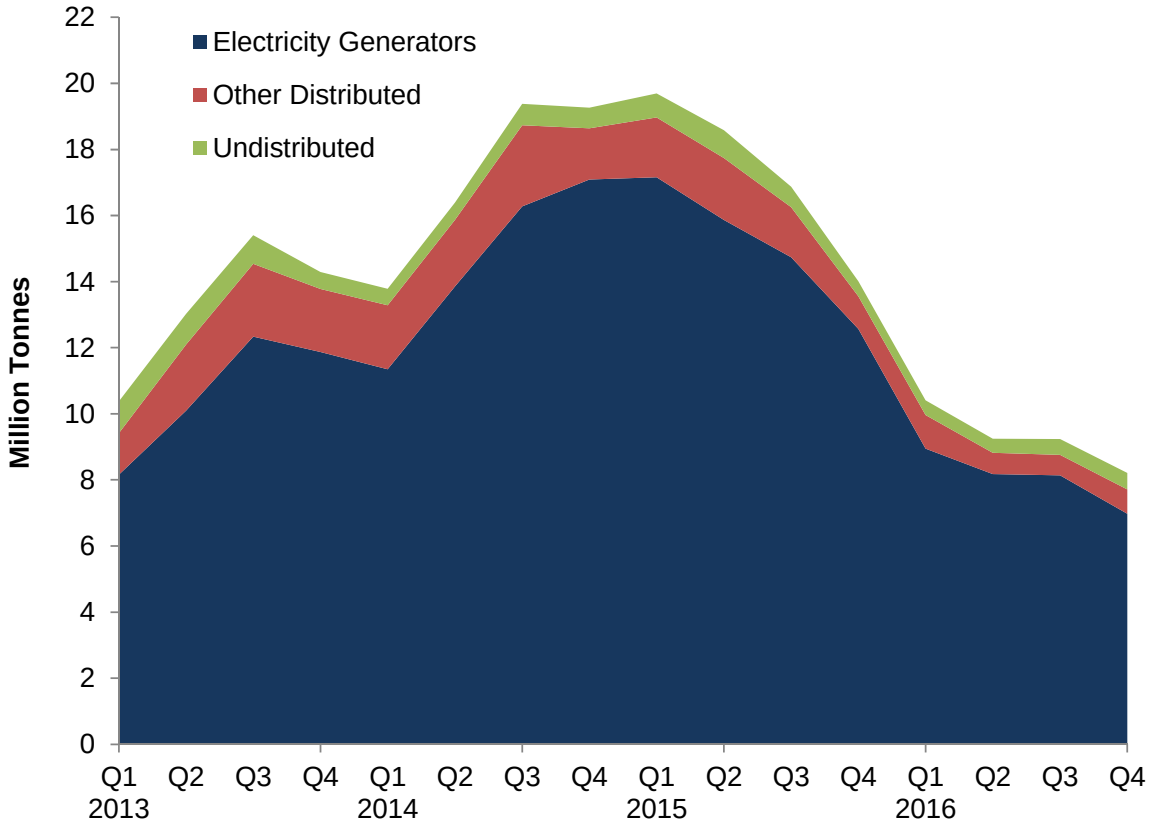
Coal used for coke manufacture fell 50 per cent to 1.8 million tonnes (a new record low), while coal used in blast furnaces fell 12 per cent to 1.4 million tonnes. This was due to SSI steelworks at Redcar ceasing production in mid-September 2015.

Total demand for coal in the fourth quarter of 2016, at 4.8 million tonnes, was 43 per cent lower than in the fourth quarter of 2015. Consumption by electricity generators was down by 51 per cent to 3.3 million tonnes. Electricity generators accounted for 69 per cent of total coal use in the fourth quarter of 2016; compared with 80 per cent a year earlier.

Sales to final consumers (as measured by disposals to final consumers) fell by 1.3 per cent in 2016. Sales to industrial users fell by 21 per cent. Sales to final consumers were up by 3.9 per cent in the fourth quarter of 2016. Sales to industrial users decreased by 27 per cent.

Coal used in blast furnaces was 0.4 million tonnes in the fourth quarter of 2016, an increase of 46 per cent compared to the fourth quarter of 2015.

Chart 2.4 Coal stocks



Coal stocks showed a fall of 5.8 million tonnes during the fourth quarter of 2016 compared to the end of December 2015 and stood at 8.2 million tonnes.

The level of coal stocks at power stations at the end of the fourth quarter of 2016 was 7.0 million tonnes (a new record), 5.6 million tonnes lower than at the end of December 2015, as stocks were used for generation while purchasing less coal from the UK and overseas.

Stocks held by coke ovens were 0.7 million tonnes at the end of the fourth quarter of 2016, this was 0.1 million tonnes higher than stock levels at the end of the December 2015.

Stocks held by producers (undistributed stocks) increased during the fourth quarter of 2016 to 0.5 million tonnes and were 40 thousand tonnes higher than at the end of December 2015.

2 SOLID FUEL AND DERIVED GASES

Table 2.1 Supply and consumption of coal

Thousand tonnes

	2015	2016 p	*per cent change*	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter	2016 2nd quarter	2016 3rd quarter	2016 4th quarter p	*per cent change*[1]
SUPPLY													
Indigenous production	8,598	4,178	*-51.4*	2,776	3,122	2,441	1,424	1,612	1,001	962	1,027	1,188	*-26.3*
Deep mined	2,784	22	*-99.2*	901	980	880	420	504	7	6	5	5	*-99.1*
Surface mining[2]	5,814	4,156	*-28.5*	1,875	2,142	1,561	1,004	1,108	994	957	1,022	1,183	*+6.8*
Imports[4]	24,198	8,294	*-65.7*	10,114	11,207	4,997	3,891	4,103	2,675	1,156	1,694	2,768	*-32.6*
Exports[5]	385	443	*+15.1*	105	111	75	104	96	103	76	137	128	*+33.0*
Stock change[6]	+5,192	+5,876	*+13.2*	+96	-419	+1,001	+1,710	+2,899r	+3,678	+1,161r	+11r	+1,025	*-64.6*
Total supply	37,602	17,904	*-52.4*	12,882	13,799	8,364	6,921	8,518r	7,252	3,203r	2,596r	4,853	*-43.0*
Statistical difference	+117	+32		+25	+141	-34	-5	+15	+29r	-1r	-0	+4	
Total demand	37,486	17,872	*-52.3*	12,857	13,658	8,398	6,926	8,504r	7,223r	3,204r	2,596r	4,849	*-43.0*
TRANSFORMATION	34,852	15,678	*-55.0*	12,053	12,976	7,747	6,316	7,813r	6,616r	2,685r	2,083r	4,294	*-45.0*
Electricity generation	29,198	12,059	*-58.7*	10,451	11,278	6,112	5,010	6,799	5,722r	1,808r	1,187r	3,342	*-50.8*
Heat generation[7]	213	213	-	80	80	43	32	58	80	43	32	58	-
Coke manufacture	3,673	1,821	*-50.4*	1,156	1,165	1,083	880	545r	443	438	464	475	*-12.8*
Blast furnaces	1,544	1,364	*-11.7*	309	423	447	330	344r	316	345	346	357	*+3.7*
Patent fuel manufacture	225	223	*-0.8*	57	31	63	64	66r	55	51	55r	62	*-6.0*
Energy industry use	-	-		-	-	-	-	-	-	-	-	-	
FINAL CONSUMPTION	2,634	2,194	*-16.7*	804	682	651	610	691r	607	519	513	554	*-19.8*
Iron & steel	45	41	*-9.1*	13	12	12	12	10	10	10	10	10	*-3.0*
Other industries	2,004	1,575	*-21.4*	618	502	505	477	519r	431	376	392	376	*-27.5*
Domestic	554	537	*-3.1*	163	159	127	114	154r	156	122	101	158	*+2.5*
Other final users	32	41	*+30.2*	9	9	7	8	8	10	11	10	10	*+31.6*
Stocks at end of period													
Distributed stocks	13,555	7,713	*-43.1*	18,641	18,971	17,742	16,255	13,555r	9,963	8,819r	8,759r	7,713	*-43.1*
Of which:													
Major power producers[8]	12,569	6,977	*-44.5*	17,091	17,158	15,864	14,737	12,569	8,948	8,178	8,140r	6,977	*-44.5*
Coke ovens	547	679	*+24.1*	795	836	955	742	547r	531	562	396	679	*+24.1*
Undistributed stocks	457	497	*+8.8*	622	724	839	616	457r	444	427	476r	497	*+8.8*
Total stocks[9]	14,012	8,209	*-41.4*	19,263	19,695	18,581	16,871	14,012r	10,407	9,246r	9,235r	8,209	*-41.4*

1. Percentage change between the most recent quarter and the same quarter a year earlier.

2. The term 'surface mining' has now replaced opencast production. Opencast production is a surface mining technique.

3. Not produced since 2013 as the only mine producing slurry has ceased trading

4. For a detailed breakdown of UK Imports by country and grade of coal refer to Table 2.4 Coal imports (internet table only).

5. Trade is counted as an export under three conditions, when it is recorded as an import and is subsequently exported; it enters the UK port with the intention of being imported but due to a change of ownership at the port it is exported without having cleared the port; and when items leave the warehouse and are exported. Trade is not classified as exports when it is resting at a UK port and the UK is not the intended final destination.

6. Stock change + = stock draw, - = stock build.

7. Heat generation is based on an annual figure and is then split over a quarterly period. The 2016 heat generation figure will not be published until the end of July 2017. Therefore, the 2015 figure is used as an estimate for 2016.

8. This includes stocks held at ports.

9. For some quarters, closing stocks may not be consistent with stock changes, due to additional stock adjustments

2 SOLID FUEL AND DERIVED GASES

Table 2.2 Supply and consumption of coke oven coke, coke breeze and other manufactured solid fuels

Thousand tonnes

	2015	2016 p	*per cent change*	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter	2016 2nd quarter	2016 3rd quarter	2016 4th quarter p	*per cent change* [3]
SUPPLY													
Indigenous production	2,965	1,593	*-46.3*	897	895	868	727	474	376	385	409	424	*-10.7*
Coke Oven Coke	2,716	1,332	*-51.0*	830	854	800	658	404	320	319	344	348	*-13.8*
Coke Breeze	18	16	*-10.6*	7	5	5	4	5	4	4	4	4	*-13.9*
Other MSF	231	245	*+6.2*	60	36	64	65	66	51	61	61	71	*+8.5*
Imports	1,132	1,142	*+0.8*	251	302	290	215	325	287	284	284r	288	*-11.5*
Exports	111	22	*-79.9*	13	23	74	7	8	6	4	6	6	*-20.9*
Stock change[1]	64	-126	*(-)*	-87	+73	+37	-50	+4	-2	+21	-15	-130	
Transfers	-3	-4		-	-2	-1	-	-	-1	-1	-0	-2	
Total supply	4,047	2,691	*-33.5*	1,049	1,246	1,121	885	796	654	685	671r	682	*-14.3*
Statistical difference	0	0		-0	-0	-	0	-0	-0	-	0	-0	
Total demand	4,047	2,691	*-33.5*	1,049	1,246	1,121	885	796	654	685	671r	682	*-14.3*
TRANSFORMATION	3,257	2,140	*-34.3*	842	1,009	908	705	635	525	548	533	535	*-15.7*
Coke manufacture	-	-		-	-	-	-	-	-	-	-	-	
Blast furnaces	3,257	2,140	*-34.3*	842	1,009	908	705	635	525	548	533	535	*-15.7*
Energy industry use	-	-		-	-	-	-	-	-	-	-	-	
FINAL CONSUMPTION	790	551	*-30.2*	207	237	213	179	161	130	137	138r	146	*-9.0*
Iron & steel	539	316	*-41.4*	134	165	151	125	98	75	79	84	78	*-20.1*
Other industries	17	0	*-100.0*	14	10	6	-	-	-	-	0	-0	
Domestic	235	236	*+0.4*	59	62	56	54	63	55	58	55r	68	*+8.2*
Stocks at end of period[2]	1,124	1,265	*+12.6*	1,188	1,115	1,028	1,038	1,124	1,126	1,108	1,142	1,265	*+12.6*

1. Stock change + = stock draw, - = stock build.

2. For some quarters, closing stocks may not be consistent with stock changes, due to additional stock adjustments

3. Percentage change between the most recent quarter and the same quarter a year earlier; (+) represents a positive percentage change greater than 100%.

2 SOLID FUEL AND DERIVED GASES

Table 2.3 Supply and consumption of coke oven gas, blast furnace gas, benzole and tars

GWh

	2015	2016 p	*per cent change*	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter	2016 2nd quarter	2016 3rd quarter	2016 4th quarter p	*per cent change [1]*
SUPPLY													
Indigenous production	22,156	14,089	*-36.4*	5,748	6,995	6,315	4,972	3,874	3,406	3,603	3,424	3,656	*-5.6*
Coke oven gas	6,890	3,468	*-49.7*	1,931	2,264	2,030	1,595	1,000	870	836	855	907	*-9.3*
Blast furnace gas	14,131	10,090	*-28.6*	3,455	4,359	3,941	3,117	2,713	2,403	2,645	2,439	2,603	*-4.1*
Benzole & tars	1,136	531	*-53.2*	361	371	344	260	161	134	123	129	145	*-9.4*
Transfers	420	344	*-18.2*	66	92	96	99	132	127	106	64	47	*-64.6*
Total supply	22,576	14,433	*-36.1*	5,813	7,088	6,411	5,071	4,006	3,534	3,709	3,487	3,703	*-7.6*
Statistical difference	+41	+1		+8	+33	-14	+5	+17	-9	+10	+7	-8	
Total demand	22,535	14,432	*-36.0*	5,805	7,054	6,425	5,066	3,989	3,543	3,699	3,480	3,711	*-7.0*
TRANSFORMATION	9,704	7,464	*-23.1*	2,668	3,192	2,580	2,053	1,880	1,804	1,882	1,767	2,011	*+6.9*
Electricity generation	9,107	6,867	*-24.6*	2,519	3,042	2,430	1,904	1,731	1,655	1,733	1,618	1,861	*+7.5*
Heat generation[2]	598	598	-	149	149	149	149	149	149	149	149	149	-
Energy industry use	8,330	4,846	*-41.8*	2,154	2,581	2,358	1,894	1,497	1,236	1,235	1,150	1,226	*-18.1*
Losses	2,646	1,116	*-57.8*	452	674	912	737	323	248	337	318	213	*-34.2*
FINAL CONSUMPTION	1,855	1,006	*-45.8*	531	608	576	383	289	255	245	244	262	*-9.3*
Iron & steel	719	475	*-33.9*	126	237	231	123	128	121	122	115	116	*-9.2*
Other industries[3]	-	-		44	-	-	-	-	-	-	-	-	
Non-Energy Use[4]	1,136	531	*-53.2*	361	371	344	260	161	134	123	129	145	*-9.4*

1. Percentage change between the most recent quarter and the same quarter a year earlier; (+) represents a positive percentage change greater than 100%.

2. For Heat generation, the 2016 figure currently shown is the 2015 figures carried forward - these will be updated in July 2017.

3. The main industrial consumer of derived gases Monckton coke-works (also a producer of them) closed in December 2014.

4. From 2009, unclassified final consumption for benzole and tars has been recorded under non energy use

Section 3 – Oil and Oil Products

Key results show:

Provisional 2016

UK production of crude and Natural Gas Liquids (NGLs) was up 4.8 per cent in 2016 compared with 2015. Production is levelling off following growth in 2015. Imports of crude and NGLs were lower by 5.7 per cent in 2016, whilst exports were 5.0 per cent higher. (**Chart 3.1**)

Production of petroleum products was broadly stable, down 2.0 per cent compared with 2015. Refinery production has been relatively robust as capacity reductions have been offset against low feedstock prices. (**Chart 3.2**)

In 2016 net imports of primary oils (crude, NGLs and process oils) made up 23 per cent of UK supply, down from 27 per cent in 2015. The UK was a net importer of petroleum products by 10.8 million tonnes. The UK is a net importer of road diesel and aviation turbine fuel but a net exporter of motor spirit. **(Chart 3.3)**

In 2016 final consumption of petroleum products was up by 1.7 per cent compared with 2015; this was driven mainly by increases in non-energy use and transport fuel consumption. **(Chart 3.4)** Demand also increased in other sectors including the domestic sector, doubtless affected by the comparatively cold weather towards the end of the year.

In 2016 total deliveries of key transport fuels increased by 1.4 per cent compared with 2015. Road diesel deliveries increased by 3.9 per cent, aviation turbine fuel was up by 0.8 per cent, while motor spirit deliveries decreased by 0.8 per cent. (**Chart 3.5**)

Quarter 4 2016

In Q4 2016, UK production of crude oil decreased by 7.2 per cent compared with quarter 4 2015. Production of NGLs increased by 28 per cent in quarter 4 2016 compared to the same period last year. **(Chart 3.1)**

Refinery production was lower by 4.7 per cent in the latest quarter of 2016 compared with the same quarter in 2015. Production in 2016 was generally robust against a background of lower crude prices. (**Chart 3.2**)

Imports of petroleum products were 4.8 per cent higher in the latest quarter compared with a year ago, whilst exports decreased by 8.4 per cent. Over the last three months, the UK was a net importer of petroleum products by 2.4 million tonnes. **(Chart 3.2)**

Total deliveries of key transport fuels were higher in Q4 2016 by 0.7 per cent. Demand for road diesel increased by 4.2 per cent and this was partially offset by a 0.8 per cent decrease in demand for motor spirit and a 3.8 per cent decrease in demand for aviation turbine fuel. **(Chart 3.5)**

Total stocks for the UK at the end of quarter 4 2016 were relatively stable on last year (a decrease of 0.1 million tonnes, or 0.9 per cent). A decrease in stocks of process oils held abroad was offset by an increase in stocks held at terminals and offshore. **(Chart 3.7)**

Oil and Oil Products

Relevant tables

Contacts for further information:

Matthew Curds
Upstream Oil (primary oils)
Oil and Gas Statistics Team
Tel. 0300 068 8414
E-mail: Matthew.Curds@beis.gov.uk

Natalie Cartwright
Downstream Oil (petroleum products)
Oil and Gas Statistics Team
Tel. 0300 068 5260
E-mail: Natalie.Cartwright@beis.gov.uk

Chart 3.1 Production and trade of crude oil and NGLs

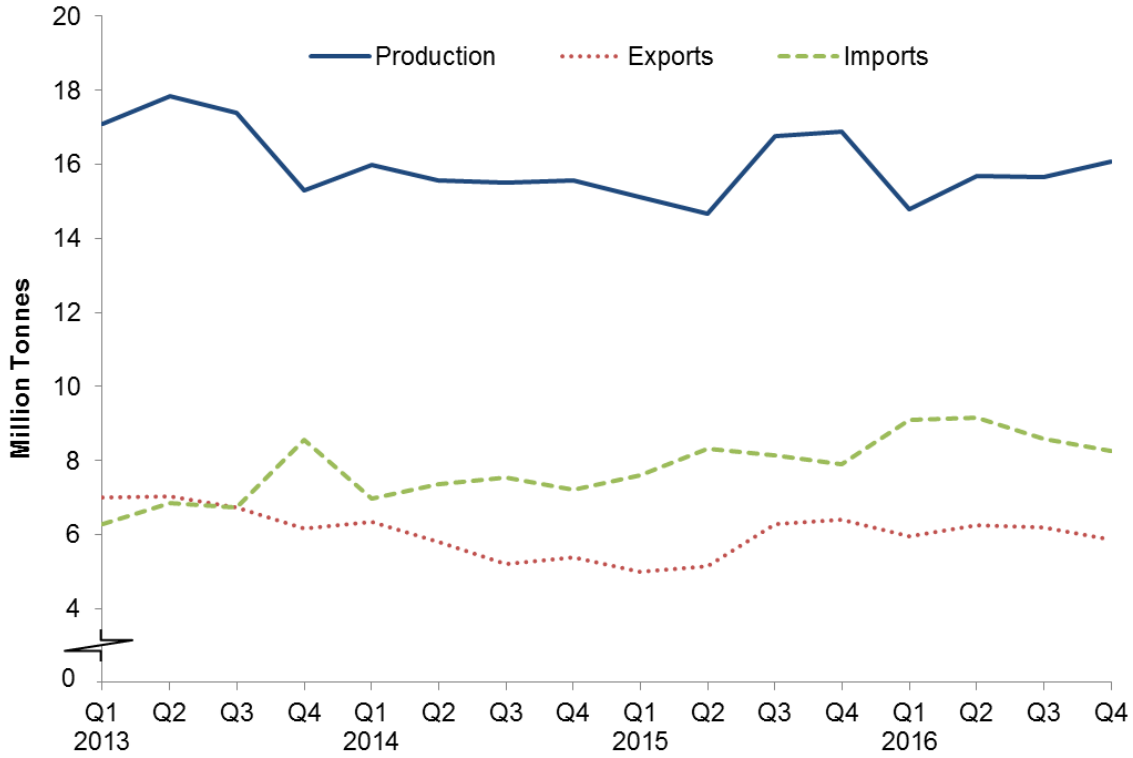
Provisional figures for 2016 show that UK crude oil and NGL production was 4.8 per cent higher than 2015. This is only the second annual increase in 20 years and is a result of new fields coming online. In the broader historical context, production now is around a third of the 1999 peak.

In 2016 imports of crude oil and NGLs decreased by 5.7 per cent and exports increased by 5.0 per cent compared to 2015. In 2016 imports of process oils (which are primarily used by refineries as feedstocks) increased by 18 per cent and exports fell by 14 per cent. As a proportion of total feedstocks, refineries processed a higher volume of indigenous oil in 2016 compared to 2015, likely due to lower crude oil prices.

In Q4 2016 indigenous production of crude oil and NGLs was lower by 5.2 per cent compared with the same quarter a year earlier, and NGL production was higher by 28 per cent. The main driver for this was a higher amount of production through the CATS and Forties terminals.

Imports of crude oil and NGLs were stable in Q4 2016 compared to the same period last year, whilst exports were higher by 4.5 per cent as refinery demand was lower in Q4 2016 compared to the year before.

Chart 3.2 Production and trade of petroleum products

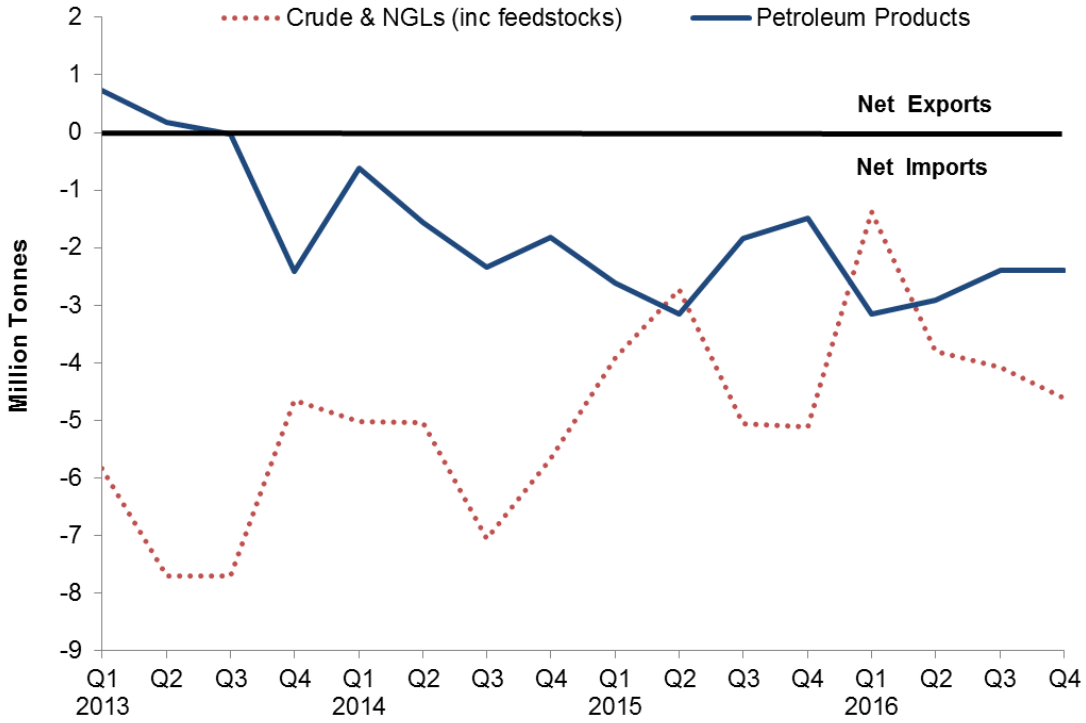


Indigenous production of petroleum products by refiners was lower by 2.0 per cent in 2016 compared with 2015. Production was robust through 2015 with refiners increasing production against a background of low crude prices, and has been stable throughout 2016 since the maintenance window early in the year which had been delayed from 2015.

In 2016 imports of petroleum products increased by 10.1 per cent and exports were up 6.4 per cent. The bulk of imports consist of middle distillates, mainly diesel road fuel and aviation turbine fuel where UK refinery production lags demand. The bulk of exports are petrol.

In Q4 2016 production of petroleum products was lower by 4.7 per cent compared with the same period last year. Q4 is usually when refiners have their maintenance window but this was postponed in 2015, resulting in higher Q4 production compared to the typical annual trend that year.

Chart 3.3 Overall trade in primary oils and petroleum products

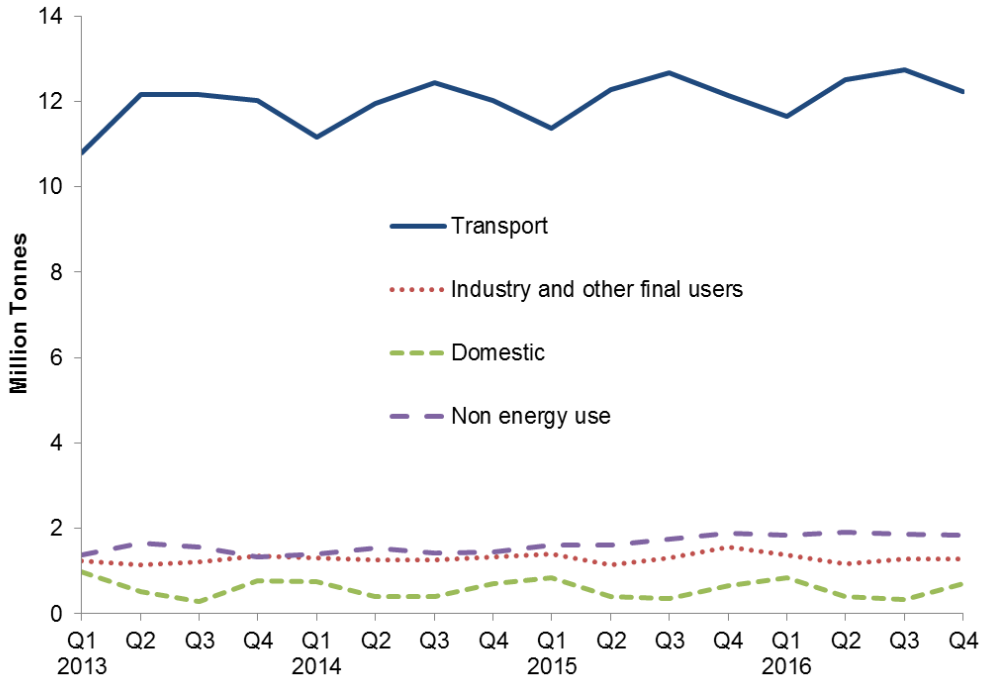


Net imports of primary oils (crude, NGLs and feedstocks) narrowed by 2.9 million tonnes to 13.9 million tonnes in 2016, mainly due to higher intake of indigenous process oils by refiners which reduced import dependency. In 2016 net imports of primary oils made up just 23 per cent of UK supply, down from 27 per cent in 2015.

In 2016 the UK was a net importer of petroleum products by 10.8 million tonnes, up from 9.1 million tonnes in 2015.

In Q4 2016 net imports of all primary oils narrowed to 4.6 million tonnes, a decrease of 0.5 million tonnes on last year. Net imports of petroleum products increased to 2.4 million tonnes, an increase of 0.9 million tonnes compared with quarter 4 2015.

Chart 3.4 Final consumption of oil



Provisional data shows that final consumption of petroleum products was up by 1.7 per cent in 2016 compared with 2015. Within this:

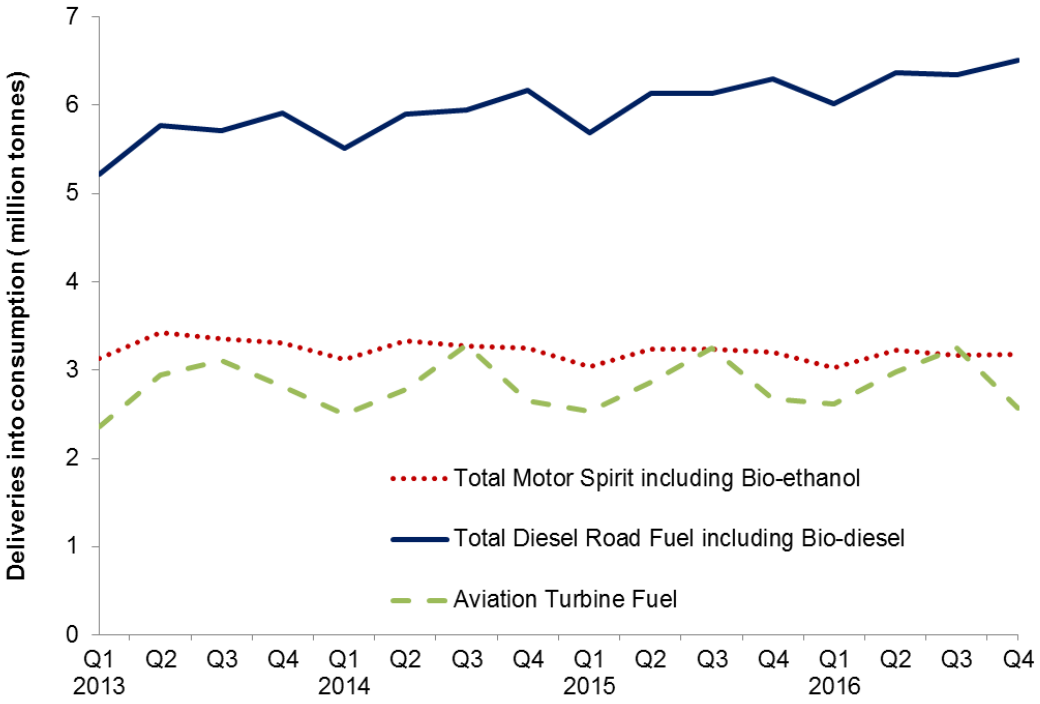
- Transport use, which accounts for more than three-quarters of UK final consumption, was higher by 1.4 per cent. In particular sales of road diesel were up 3.9 per cent and the decline in motor spirit consumption remained slow at 0.8 per cent (see Chart 3.5).

- Non-energy use of oil products was up 9.4 per cent compared with last year. This increase has been driven primarily by an increase in deliveries of petroleum gases to petrochemical plants where they are used as feedstocks.

- Domestic use was up 2.3 per cent, mainly in demand for burning oil and other gases used for heating purposes. Average daily temperatures in November and December were approximately 3 degrees lower in 2016 compared to 2015 (see Weather Table 7.1).

In Q4 2016 final consumption of petroleum products was broadly stable (down 0.9 per cent on 2015), despite an increase in domestic consumption due to a particularly cold November. Transport – the main driver of petroleum demand – increased 0.7 per cent on the same period last year.

Chart 3.5 Demand for key transport fuels



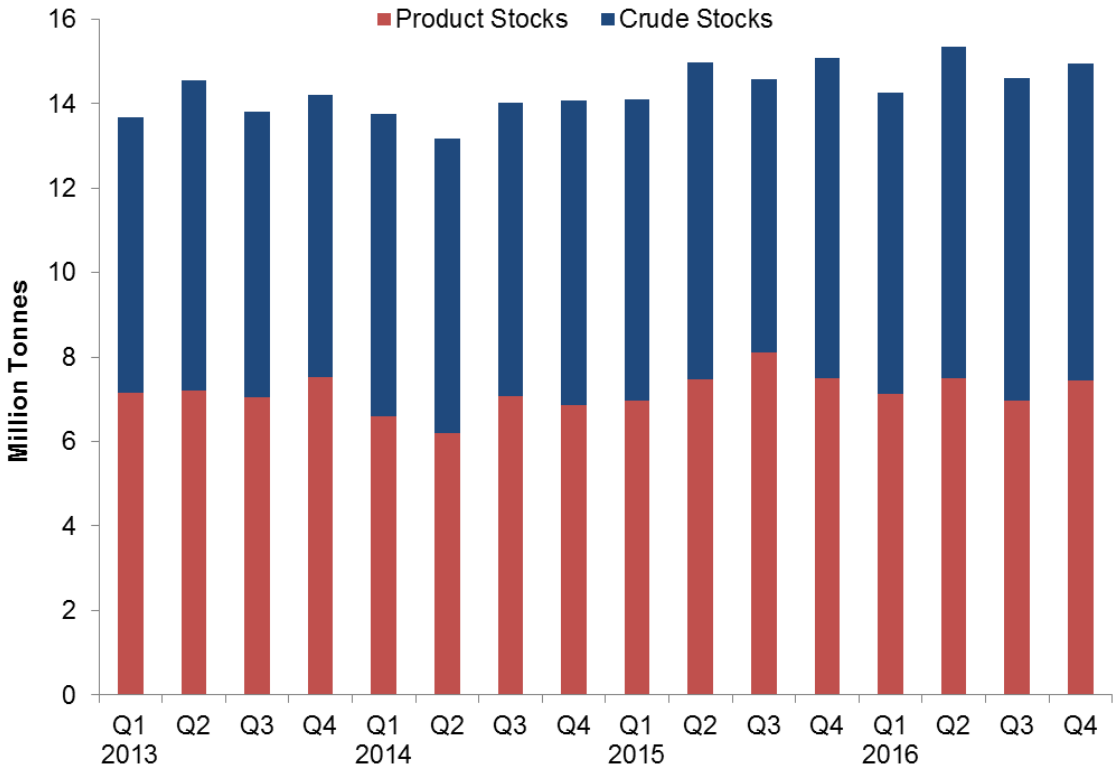
Including biofuels, 2016 diesel road fuel sales were higher by 4.1 per cent compared with 2015.

Motor spirit has been on a downward trend since 1990, reflecting a long-term shift to diesel engine vehicles. However the rate of decline for petrol sales has slowed in both 2014 and 2015 to 2.0 per cent, and the decline was just 1.0 per cent in 2016. This was the slowest decline since 2002 and contrasts with an average decline of 4 per cent annually since 2007. The recent contraction in reduced demand could reflect lower pump prices since 2014 (DECC Quarterly Energy Prices, Table 4.1.2).

Demand for aviation turbine fuel was stable - up 0.8 per cent - compared to 2015.

In Q4 2016 total motor sprit sales including biofuels were lower by just 0.6 per cent compared with a year earlier whilst road diesel sales were higher by 3.4 per cent. This is in line with recent trends.

Chart 3.6 UK oil stocks



Total stocks for the UK at the end of Q4 2016 were stable on last year, down just 0.9 per cent (a decrease of 0.1 million tonnes). Overall physical stocks held in the UK were stable on last year whereas stocks held abroad under official agreement were down 5.2 per cent, driven here by a decrease in tickets for crude and process oils. Overall stocks of crude and process oils were stable on last year with more stocks being held offshore and in terminals to offset the reduction in volumes held under bilateral agreements.

Further information on how the UK meets its oil stocking obligations are set out at:
www.gov.uk/government/publications/uk-emergency-oil-stocking-international-obligations

3 OIL AND OIL PRODUCTS

Table 3.1 Supply and use of crude oil, natural gas liquids and feedstocks[1]

Thousand tonnes

	2015	2016 p	*per cent change*	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter	2016 2nd quarter	2016 3rd quarter	2016 4th quarter p	*per cent change*[8]
SUPPLY													
Indigenous production[2]	45,698	47,874	*+4.8*	10,510	10,836	12,141	10,515	12,206	12,716	12,210	11,377r	11,572	*-5.2*
Crude oil	42,826	44,308	*+3.5*	9,779	10,163	11,364	9,895	11,404	11,816	11,347	10,560r	10,585	*-7.2*
NGLs[3]	2,462	3,138	*+27.5*	623	577	689	508	688	784	757	717	880	*+27.9*
Feedstocks	410	428	*+4.2*	108	96	88	112	114	116	105	100	106	*-6.8*
Imports[4]	50,478	48,856	*-3.2*	14,174	11,993	12,068	12,969	13,448	11,477	11,791	12,305r	13,283	*-1.2*
Crude oil & NGLs	45,157	42,560	*-5.7*	13,101	10,928	10,931	11,396	11,902	9,842	10,171	10,681r	11,866	*-0.3*
Feedstocks	5,322	6,296	*+18.3*	1,074	1,065	1,137	1,574	1,547	1,635	1,620	1,624r	1,417	*-8.4*
Exports[4]	33,660	34,968	*+3.9*	8,515	8,082	9,339	7,908	8,331	10,092	7,989r	8,225r	8,662	*+4.0*
Crude Oil & NGLs	31,730	33,312	*+5.0*	8,231	7,587	8,846	7,279	8,018	9,460	7,544	7,931r	8,378	*+4.5*
Feedstocks	1,930	1,656	*-14.2*	284	494	493	630	313	633	445r	294r	284	*-9.1*
Stock change[5]	-59	-209	*(+)*	-566	-59	-384	970	-586	355	-492	95r	-167	*(-)*
Transfers[6]	-1,152	-1,241	*+7.7*	-455	-100	-382	-225	-445	-225	-368	-209	-439	*-1.4*
Total supply	61,306	60,312	*-1.6*	15,149	14,588	14,104	16,322	16,292	14,231	15,152r	15,343r	15,586	*-4.3*
Statistical difference[7]	-35	+53		+8	-11	+1	-11	-16	+34	-17r	+11r	+24	
Total demand	61,342	60,260	*-1.8*	15,141	14,599	14,103	16,332	16,308	14,196	15,169	15,332	15,562	*-4.6*
TRANSFORMATION	61,342	60,260	*-1.8*	15,141	14,599	14,103	16,332	16,308	14,196	15,169	15,332	15,562	*-4.6*
Petroleum refineries	61,342	60,260	*-1.8*	15,141	14,599	14,103	16,332	16,308	14,196	15,169	15,332	15,562	*-4.6*

1. As there is no use made of primary oils and feedstocks by industries other than the oil and gas extraction and petroleum refining industries, other industry headings have not been included in this table. As such, this table is a summary of the activity of what is known as the Upstream oil industry.
2. Includes offshore and onshore production.
3. Natural Gas Liquids (NGLs) are condensate and petroleum gases derived at onshore treatment plants.
4. Foreign trade as recorded by the Petroleum Industry which may differ from the figures published by HM Revenue and Customs in the Overseas Trade Statistics. Data are subject to further revision as revised information on imports and exports becomes available.
5. Stock fall (+), stock rise (-). Stocks include stocks held at refineries, at oil terminals and also those held in tanks and partially loaded vessels at offshore facilities.
6. Mostly direct disposals to petrochemical plants.
7. Total supply minus total demand.
8. Percentage change between the most recent quarter and the same quarter a year earlier.

3 OIL AND OIL PRODUCTS

Table 3.2 Supply and use of petroleum products

Thousand tonnes

	2015	2016 p	*per cent change*	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter	2016 2nd quarter	2016 3rd quarter	2016 4th quarter p	*per cent change* [1]
SUPPLY													
Indigenous production[2]	63,420	62,181	*-2.0*	15,577	15,122	14,657	16,758	16,883	14,781	15,675r	15,640r	16,084	*-4.7*
Imports[3]	31,918	35,131	*+10.1*	7,213	7,594	8,309	8,124	7,891	9,109	9,170r	8,585r	8,267	*+4.8*
Exports[3]	22,835	24,290	*+6.4*	5,387	4,984	5,159	6,283	6,409	5,965	6,266r	6,189r	5,870	*-8.4*
Marine bunkers	2,426	2,660	*+9.6*	764	526	673	679	548	538	727r	763r	633	*+15.5*
Stock change[4]	-743	+44		184	-142	-266	-267	-68	102	-278	460	-241	
Transfers[5]	-1,190	-1,309		-125	-530	-249	-227	-184	-474	-300	-281	-253	
Total supply	68,144	69,096	*+1.4*	16,699	16,533	16,619	17,426	17,565	17,016	17,273r	17,453r	17,354	*-1.2*
Statistical difference[6]	-27	-51		-34	+65	-14	-44	-35	-25	-21r	11r	-15	
Total demand	68,171	69,147	*+1.4*	16,733	16,467	16,633	17,471	17,600r	17,040	17,295r	17,442r	17,370	*-1.3*
TRANSFORMATION	1,116	1,108	*-0.6*	271	260	254	290	311	309	261	259	279	*-10.3*
Electricity generation	551	528	*-4.1*	124	130	126	140	155	153	117	121	137	*-11.3*
Heat generation	59	59	*+0.0*	15	15	15	15	15	15	15	15	15	-
Other Transformation	506	522	*+3.0*	131	115	113	136	142	142	130	123	127	*-10.1*
Energy industry use	4,099	3,997	*-2.5*	938	994	933	1,108	1,064	997	1,028	958	1,014	*-4.7*
Petroleum Refineries	3,400	3,298	*-3.0*	772	819	758	933	889	822	853	783	839	*-5.6*
Blast Furnaces	-	-		-	-	-	-	-	-	-	-	-	
Others	699	699	*+0.0*	166	175	175	175	175	175	175	175	175	-
FINAL CONSUMPTION	62,957	64,041	*+1.7*	15,524	15,213	15,446	16,072	16,225r	15,734	16,005r	16,225r	16,076	*-0.9*
Iron & steel	6	1	*-81.5*	2	1	2	1	1	1	0	0	0	*(-)*
Other industries	3,765	3,624	*-3.8*	982	1,003	764	850	1,149	1,046	775r	878r	925	*-19.6*
Transport	48,457	49,121	*+1.4*	12,020	11,381	12,285	12,660	12,131	11,656	12,512r	12,734r	12,219	*+0.7*
Domestic	2,258	2,310	*+2.3*	715	840	406	363	649	837	415r	343r	715	*+10.3*
Other final users	1,639	1,512	*-7.7*	356	388	381	451	418r	343	390r	414r	365	*-12.7*
Non energy use	6,832	7,473	*+9.4*	1,449	1,600	1,608	1,747	1,877	1,851	1,912r	1,856r	1,853	*-1.3*

1. Percentage change between the most recent quarter and the same quarter a year earlier; (+) represents a positive percentage change greater than 100%.
2. Includes refinery production and petroleum gases extracted as products during the production of oil and gas.
3. Foreign trade as recorded by the Petroleum Industry which may differ from the figures published by HM Revenue and Customs in the Overseas Trade Statistics. Data are subject for further revision as revised information on imports and exports becomes available.
4. Stock fall (+), stock rise (-).
5. Mainly transfers from product to feedstock.
6. Total supply minus total demand.

3 OIL AND OIL PRODUCTS

Table 3.4 Supply and use of petroleum products - latest quarter

Thousand tonnes

	2015 4th quarter									2016 4th quarter p								
	Total Petroleum Products	Motor spirit	DERV [9]	Gas oil[1]	Aviation turbine fuel	Fuel oils	Petroleum gases[2]	Burning oil	Other products[3]	Total Petroleum Products	Motor spirit	DERV [9]	Gas oil[1]	Aviation turbine fuel	Fuel oils	Petroleum gases[2]	Burning oil	Other products[3]
SUPPLY																		
Indigenous Production[4]	16,883r	4,665	3,969	1,704	1,130	1,296	1,685r	580	1,854	16,084	4,529	3,747	1,675	1,012	1,022	1,635	598	1,865
Imports[5]	7,891	1,025	2,746	605	1,983	202	237	250	842	8,267	974	3,431	364	2,226	272	238	162	601
Exports[5]	6,409	3,005	531	738	305	964	170	45	651	5,870	2,934	475	585	251	785	156	27	658
Marine bunkers	548	-	-	325	-	223	0	-	-	633	-	-	410	-	223	-	-	-
Stock change[6]	-68	+3	+23	-56	+76	-6	+13	-65	-55	-241	+28	-194	-33	-104	+28	+37	+3	-6
Transfers[7]	-184	+370	-86	+38	-217	-116	-	+209	-381	-253	+432	-116	+75	-308	-138	-21	+298	-476
Total supply	17,565r	3,058	6,121	1,228	2,667	188	1,765r	929	1,609	17,354	3,029	6,394	1,088	2,575	176	1,733	1,034	1,327
Statistical difference[8]	-35	+18	-	-1	-9	-6	-73	-2	+39	-15	+13	-	-	+0	-1	-88	+0	+61
Total demand	17,600r	3,040	6,106	1,229	2,677	194	1,838r	931	1,584	17,370	3,016	6,360	1,088	2,575	177	1,821	1,034	1,299
TRANSFORMATION	311	-	-	27	-	63	180	-	41	279	-	-	33	-	54	169	-	24
Electricity generation	155	-	-	25	-	52	63	-	-	137	-	-	31	-	43	63	-	0
Heat generation	15	-	-	1	-	11	2	-	-	15	-	-	1	-	11	2	-	-
Petroleum refineries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Coke manufacture	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blast furnaces	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Patent fuel manufacture	24	-	-	-	-	-	0	-	24	18	-	-	-	-	-	0	-	18
Other transformation [9]	117	-	-	-	-	-	115	-	3	109	-	-	-	-	-	103	-	6
Energy industry use	1,064	-	-	-	-	-	505	-	311	1,014	-	-	-	-	-	498	-	281
FINAL CONSUMPTION	**16,225**	**-**	**-**	**1,044**	**-**	**42**	**1,153**	**-**	**1,232**	**16,076**	**-**	**-**	**897**	**-**	**46**	**1,154**	**-**	**994**
Iron & steel	1	-	-	-	-	1	0	-	-	0	-	-	-	-	0	-	-	-
Other industries	1,149r	-	-	437	-	21	89r	376	227	925	-	-	373	-	46	72	417	16
Transport	12,131	3,040	6,106	285	2,677	0	21	-	2	12,219	3,016	6,360	248	2,575	0	17	-	3
Domestic	649	-	-	35	-	-	59	555	-	715	-	-	32	-	-	67	617	-
Other final users	418r	-	-	283	-	20	115r	-	-	365	-	-	240	-	0	124	-	-
Non energy use	1,877	-	-	4	-	-	869	-	1,004	1,853	-	-	3	-	-	874	-	975

1. Includes middle distillate feedstock destined for use in the petrochemical industry and marine diesel
2. Includes ethane, propane, butane and other petroleum gases
3. Includes naphtha, industrial and white spirits, lubricants, bitumen, petroleum waxes, petroleum coke and other oil products
4. Includes refinery production and petroleum gases extracted as products during the production of oil and gas
5. Foreign trade as recorded by the Petroleum Industry which may differ from the figures published by HM Revenue and Customs in the Overseas Trade Statistics. Data are subject to further revision as revised information on imports and exports becomes available
6. Stock fall (+), stock rise (-).
7. Mainly transfers from product to feedstock.
8. Total supply minus total demand.
9. Backflows from petrochemical companies have been placed on a separate row for the first time June 2016. Please see article in Energy Trend June 2016 for more information

3 OIL AND OIL PRODUCTS

Table 3.5 Biofuel sales and sales through supermarkets[1]

Thousand tonnes

	2015	2016 p	*per cent change*	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter	2016 2nd quarter	2016 3rd quarter	2016 4th quarter p	*per cent change* [2]
MOTOR SPIRIT													
of which, Hydrocarbon [3]	12,082	11,980	*-0.8%*	3,086	2,893	3,076	3,072	3,040	2,877	3,072	3,014r	3,016	*-0.8%*
of which, Bio-ethanol [4]	631	612	*-3.1%*	160	150	161	163	157	146	154	150r	161	*2.7%*
Total Motor Spirit including Bio-ethanol	**12,713**	**12,592**	*-1.0%*	**3,247**	**3,043**	**3,237**	**3,235**	**3,197**	**3,023**	**3,226**	**3,164r**	**3,178**	*-0.6%*
of which, sold through Supermarkets [5]	5,794	5,885	*1.6%*	1,464	1,418	1,467	1,435	1,473	1,480	1,479	1,453	1,473	*0.0%*
DIESEL ROAD FUEL													
of which, Hydrocarbon [3]	23,656	24,590	*3.9%*	5,960	5,575	5,998	5,976	6,106	5,889	6,173	6,167r	6,360	*4.2%*
of which, Bio-diesel [4]	595	646	*8.5%*	204	111	135	158	191	127	195	174r	149	*-22.0%*
Total Diesel Road Fuel including Bio-diesel	**24,251**	**25,236**	*4.1%*	**6,164**	**5,687**	**6,133**	**6,134**	**6,298**	**6,016**	**6,368**	**6,342r**	**6,510**	*3.4%*
of which, sold through Supermarkets 5	6,644	7,267	*9.4%*	1,658	1,605	1,648	1,706	1,685	1,793	1,802	1,814	1,858	*10.3%*

1. Monthly data for inland deliveries of oil products are available - See BEIS website: https://www.gov.uk/government/collections/oil-statistics
2. Percentage change between the most recent quarter and the same quarter a year earlier.
3. Demand excluding bioethanol. Based on HMRC data.
4. Bioethanol based on HMRC data and excludes other renewables
5. Data for sales by supermarkets collected by a monthly reporting system. Includes Asda, Morrisons, Sainsburys and Tesco only.

3 OIL AND OIL PRODUCTS

Table 3.6 Stocks of petroleum[1] at end of period

Thousand tonnes

		Crude oil and refinery process oil					Petroleum products							Total stocks		
		Refineries[2]	Terminals[3]	Offshore[4]	Net bilaterals of Crude and Process oil [5]	Total[5]	Motor Spirit[6]	Kerosene[7]	Gas/Diesel Oil[8]	Fuel oils	Other products[9]	Net bilaterals of products [5]	Total products	Total Net bilaterals [5]	Total Stocks in UK[10]	Total stocks
2012		3,829	1,194	473	195	5,690	605	1,427	1,931	491	841	2,441	7,735	2,636	10,790	13,425
2013		3,592	1,102	513	1,469	6,677	1,041	1,419	1,539	404	693	2,432	7,528	3,901	10,304	14,205
2014		3,876	1,147	460	1,728	7,211	947	1,178	1,656	253	773	2,064	6,871	3,792	10,290	14,082
2015		3,156	1,629	499	2,289	7,574	1,084	1,425	1,858	314	792	2,022	7,497	4,312	10,759	15,070
2016 p		3,088	1,795	610	2,006	7,500	1,079	1,342	2,033	218	687	2,082	7,442	4,089	10,853	14,942
2014	4th quarter	3,876	1,147	460	1,728	7,211	947	1,178	1,656	253	773	2,064	6,871	3,792	10,290	14,082
2015	1st quarter	3,793	991	461	1,871	7,116	1,304	1,142	1,553	292	634	2,051	6,976	3,922	10,170	14,092
	2nd quarter	3,590	1,565	474	1,862	7,491	1,150	1,265	1,706	348	697	2,315	7,481	4,177	10,795	14,972
	3rd quarter	3,098	1,211	350	1,793	6,451	1,087	1,436	1,825	314	750	2,703	8,116	4,496	10,071	14,567
	4th quarter	3,156	1,629	499	2,289	7,574	1,084	1,425	1,858	314	792	2,022	7,497	4,312	10,759	15,070
2016	1st quarter	3,081	1,370	478	2,193	7,122	1,085	1,456	1,767	247	763	1,812	7,130	4,005	10,247	14,253
	2nd quarter	3,201r	1,586	635	2,427	7,849r	1,158r	1,398r	1,990r	270r	780r	1,899	7,495r	4,326	11,018r	15,344r
	3rd quarter	3,238r	1,473	615r	2,323r	7,650r	1,107r	1,241r	1,809r	261r	718r	1,826r	6,964r	4,150	10,464r	14,614r
	4th quarter p	3,088	1,795	610	2,006	7,500	1,079	1,342	2,033	218	687	2,082	7,442	4,089	10,853	14,942
Per cent change [11]		*-2.1*	*+10.2*	*+22.2*	*-12.4*	*-1.0*	*-0.5*	*-5.8*	*+9.4*	*-30.7*	*-13.2*	*+3.0*	*-0.7*	*-5.2*	*+0.9*	*-0.9*

1. Stocks held at refineries, terminals and power stations. Stocks in the wholesale distribution system and certain stocks at offshore fields (UK Continental Shelf [UKCS]), and others held underare approved bilateral agreements also included.
2. Stocks of crude oil, NGLs and process oil at UK refineries.
3. Stocks of crude oil and NGLs at UKCS pipeline terminals.
4. Stocks of crude oil in tanks and partially loaded tankers at offshore fields (UKCS).
5. The difference between stocks held abroad for UK use under approved bilateral agreements and the equivalent stocks held in the UK for foreign use. From 2013 onwards, EU Directive 2009/119/EC came into effect and this has lead to changes in how UK companies manage their stock-holding. The increase in crude stocks held abroad was at the expense of a decrease in product stocks held under similar agreements.
6.Motor spirit and aviation spirit.
7. Aviation turbine fuel and burning oil.
8. Gas oil, DERV fuel, middle distillate feedstock (mdf) and marine diesel oil.
9. Ethane, propane, butane, other petroleum gases, naphtha (ldf), industrial and white spirits, bitumen, petroleum wax, lubricating oil, petroleum coke, and miscellaneous products.
10. Stocks held in the national territory or elsewhere on the UKCS
11. Percentage change between the most recent quarter and the same quarter a year earlier.

Section 4 - Gas

Key results show:

Provisional 2016
In 2016, gross production of natural gas was 3.6 per cent higher than in 2015, continuing the upward trend that began in 2014 **(Chart 4.1).** This is due in part to higher volumes of gas following the start-up of the relatively large Laggan field towards the middle of 2016, alongside limited maintenance activity throughout the year.

Gas imports were 5.9 per cent higher than in 2015, yet LNG imports decreased by 20.0 per cent in this time as pipeline imports rose by 17.9 per cent year-on-year. Exports of gas decreased by 23 per cent as a result of increased demand and Irish exports failing due to production from the new Corrib gas field. Net imports increased by 19.9 per cent on 2015, driven by the low exports figures. **(Chart 4.4)**

Gas demand in 2016 was up significantly on last year – up 12.6 per cent – and the highest demand figure since 2011. This increase has been driven by the 39 per cent rise in gas (instead of coal) used in electricity generation, as well as a 5.1 per cent increase in domestic gas use, related to a colder winter in 2016 than in 2015. **(Chart 4.6)**

Quarter 4 2016
UK demand for natural gas in Q4 2016 was up a quarter in comparison to Q4 2015, to around 271 TWh the highest Q4 demand since the notably cold 2010. Within this there has been a significant increase in gas used for electricity generation, which is up 48 per cent. Final consumption has also increased 19.9 per cent with domestic, other final users and other industry all increasing by 24, 22 and 5.6 per cent respectively. These increases were driven by colder temperatures, with the coldest November since 2010 and a December substantially colder than last year. **(Chart 4.6)**

Gross UK production of natural gas in Q4 2016 was 3.3 per cent higher on Q4 2015, at 126 TWh **(Chart 4.1).** Within this production of associated gas was 13.0 per cent higher, whilst dry gas production was14.5 per cent lower **(Chart 4.2)**.

Net imports increased by 44 per cent in comparison to Q4 2015 **(Chart 4.4).** This is largely due to exports falling by 52 per cent to 20 TWh, the lowest quarterly figure since 2006, while imports in Q4 2016 were up 16.2 per cent. A particularly cold Q4 2016 and the delayed restart of gas withdrawals from the Rough Storage Facility could also have affected the trade figures.

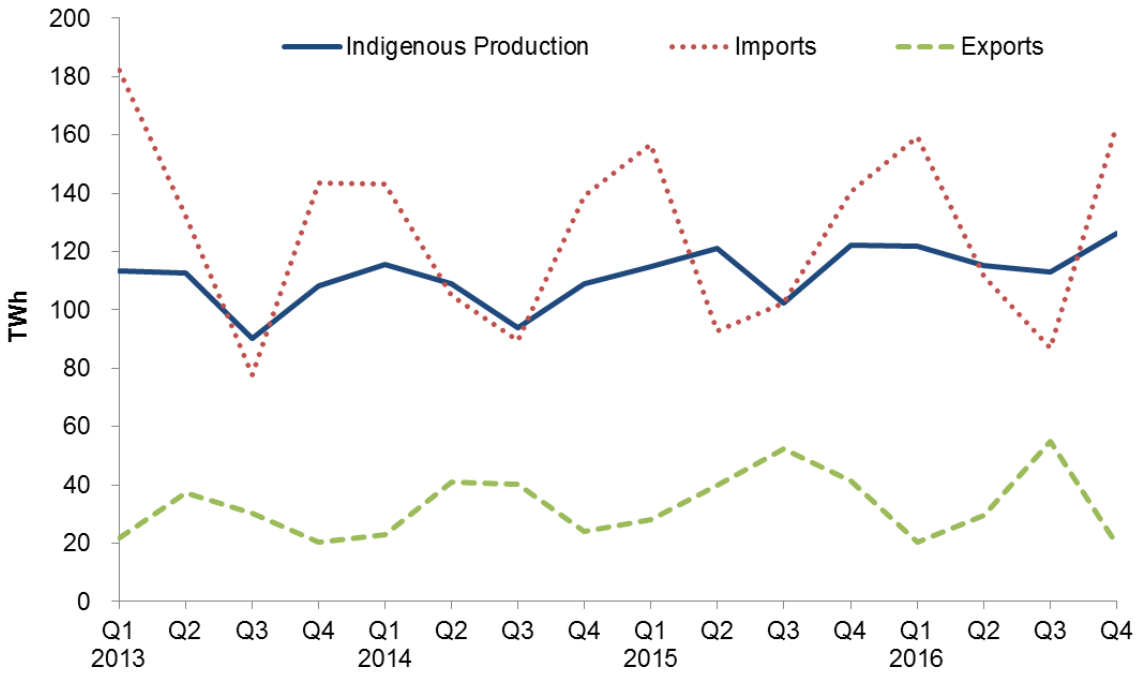
Relevant table

Contacts for further information:

Matthew Curds
Upstream gas
Oil and Gas Statistics Team
Tel. 0300 068 8414
E-mail: Matthew.Curds@beis.gov.uk

James Halliwell
Downstream gas
Oil and Gas Statistics Team
Tel. 0300 068 8121
E-mail: James.Halliwell@beis.gov.uk

Chart 4.1 Production and imports and exports of natural gas



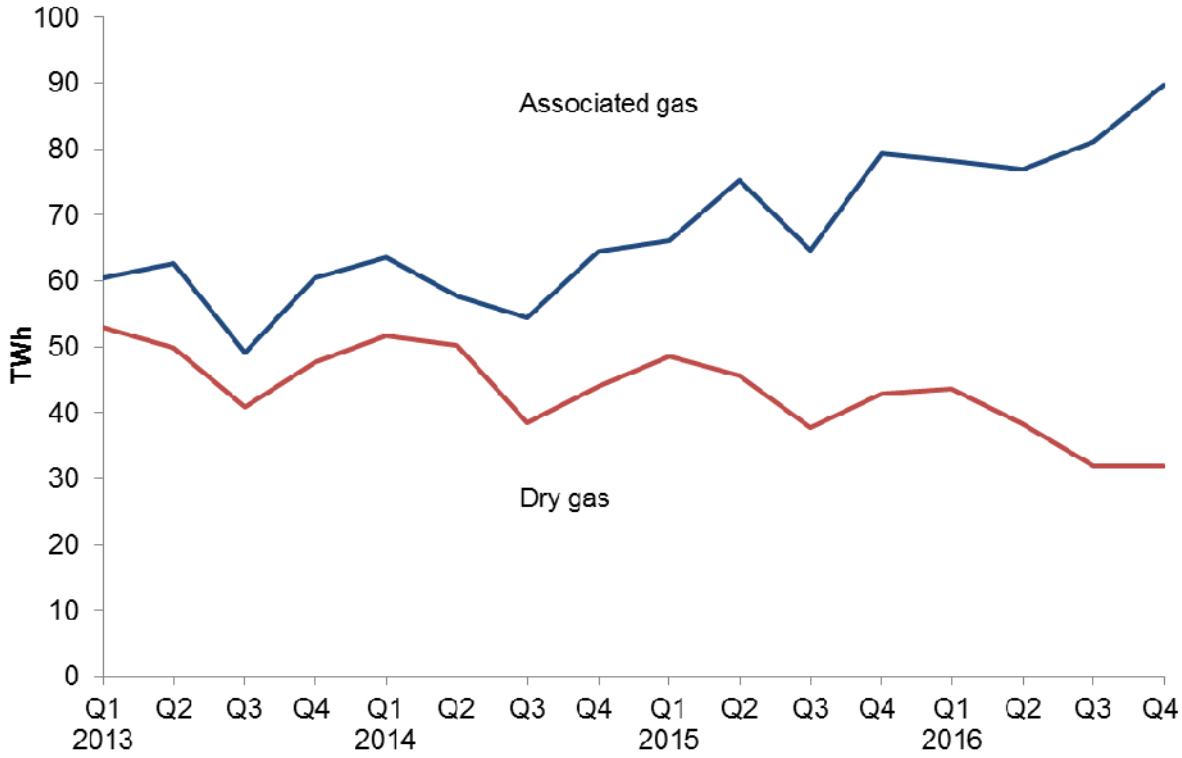
Production of natural gas in 2016 was 3.6 per cent higher than in 2015. Year-on-year production has decreased by an average of nearly 6 per cent since 2000, but has seen an increase in the years since 2014. This recent trend is driven by both reduced maintenance and new fields, such as Laggan coming on stream towards the middle of 2016.

Imports in 2016 increased by 5.9 per cent compared to 2015, most notably caused by the 11.9 per cent increase in gas coming to the UK from Norway. Exports decreased from 2015 by 22.7 per cent in 2016 to 124,866 GWh, with exports to Belgium, the Republic of Ireland and the Netherlands down.

In Q4 2016, gross production of natural gas was up 3.3 per cent on Q4 2015. This is in line with the recent upwards trend previously mentioned and was driven by an 8.4 per cent increase in October 2016 production figures in comparison to October 2015. The increase is due to a number of factors including production from the new Laggan field and the continued strong production across much of the UK's Continental Shelf.

Imports in Q4 2016 were up 16.2 per cent in comparison to the same quarter in 2015. This increase has largely been driven by imports from Norway which are up 28.6 per cent for the quarter. Exports decreased by 52.1 per cent on Q4 2016, with exports to the Republic of Ireland down 33.0 per cent and exports to Belgium down 79.1 per cent from 23,882 to 4,990 GWh.

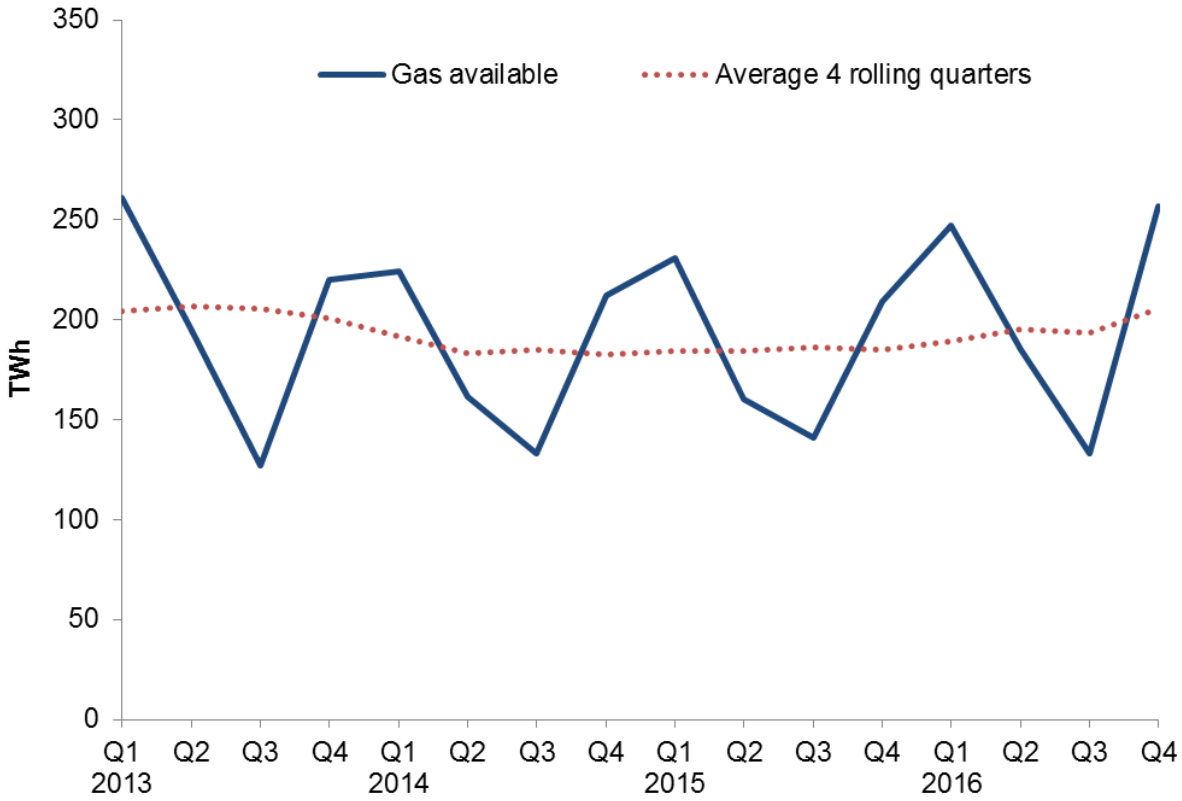
Chart 4.2 Production of dry gas and associated gas



Production of associated gas (natural gas produced from oil fields) in 2016 was up by 14.2 per cent compared to 2015, partly reflecting steady production from a number of new, relatively large condensate fields in the North Sea. In Q4 2016 associated gas production increased by 13.0 per cent versus Q4 2015, from 79 TWh to 90 TWh.

Compared to the same quarter in 2015 dry gas production decreased by 14.5 per cent to 37 TWh. Overall, dry gas production fell by 13.8% in 2016 compared to 2015.

Chart 4.3 Gas availability

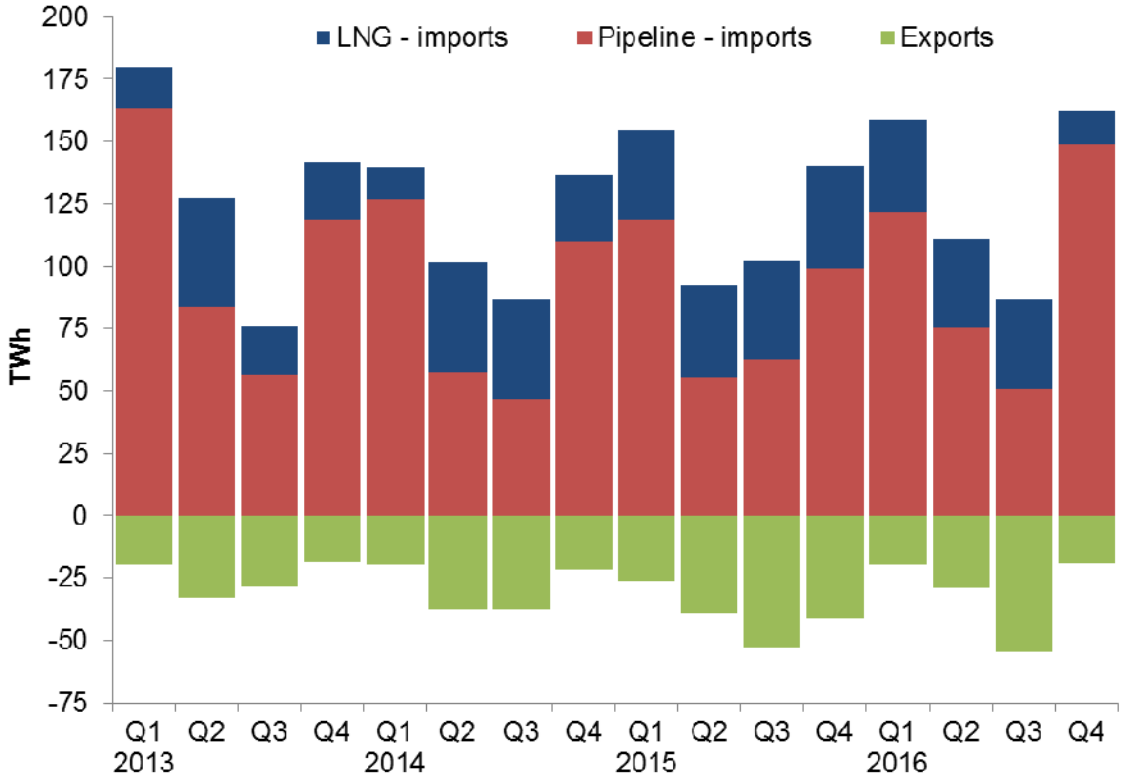


Gas available at terminals is equal to the gross gas production minus producers own use, plus net imports.

Gas availability is seasonal, mirroring gas demand, and peaks during Q1 and Q4 each year. Gas availability in Q4 2016 increased by 22.8 per cent compared to Q4 2015 to 257 TWh. This was driven by an increase in net imports.

The long-term picture shows that the average availability over 4 rolling quarters had remained fairly constant since the start of 2012 before increasing slightly since the start of 2015. Over 2016, the amount of gas available rose by 11.0 per cent on 2015.

Chart 4.4 Import and exports



In 2016, imports of natural gas increased by 5.9 per cent on 2015, whereas exports decreased by 22.7 per cent. Net imports increased by 19.9 per cent over the year, clearly driven by the large decrease in exports.

Pipeline imports in 2016 were 17.9 per cent higher, whilst LNG imports were down by a fifth compared to 2015. LNG imports accounted for 23.4 per cent of total imports in 2016, compared to 31.0 per cent in 2015. This is driven by a 20.7 per cent decrease in imports from the UK's biggest LNG supplier, Qatar.

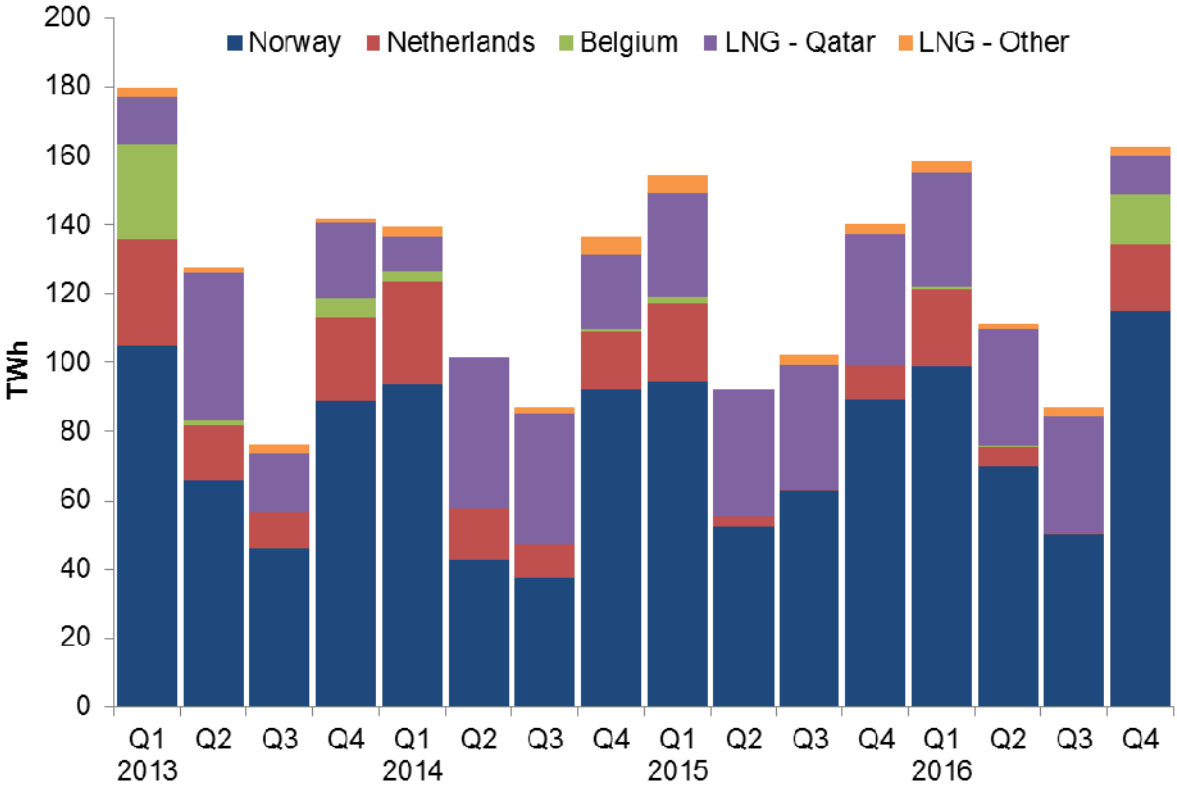
Net imports during Q4 2016 were up by 44.5 per cent in comparison to the same quarter in 2015**.** This increase has been driven a significantly lower export figure, a result of increased demand.

Imports in Q4 2016 were up 16.2 per cent in comparison to Q4 2015. This increase has largely been driven by imports from Norway which is up 28.6 per cent for the quarter. Imports of LNG have decreased by two thirds since Q4 2015, due to these decreases LNG only accounted for 8.4 per cent of total imports in Q4 2016, compared to 29.2 per cent for the same quarter last year.

Exports decreased by 52.1 per cent over the same time frame. This decrease has been driven by a 79.1 per cent decrease in exports to Belgium and a 33.0 per cent decrease to the Republic of Ireland. This is largely due to the production from the Corrib gas field which is now supplying Ireland.

Liquefied Natural Gas 'reloads' started in late 2014 and have continued since with the UK exporting to various countries such as Brazil, Pakistan and the United Arab Emirates.

Chart 4.5 Imports by origin



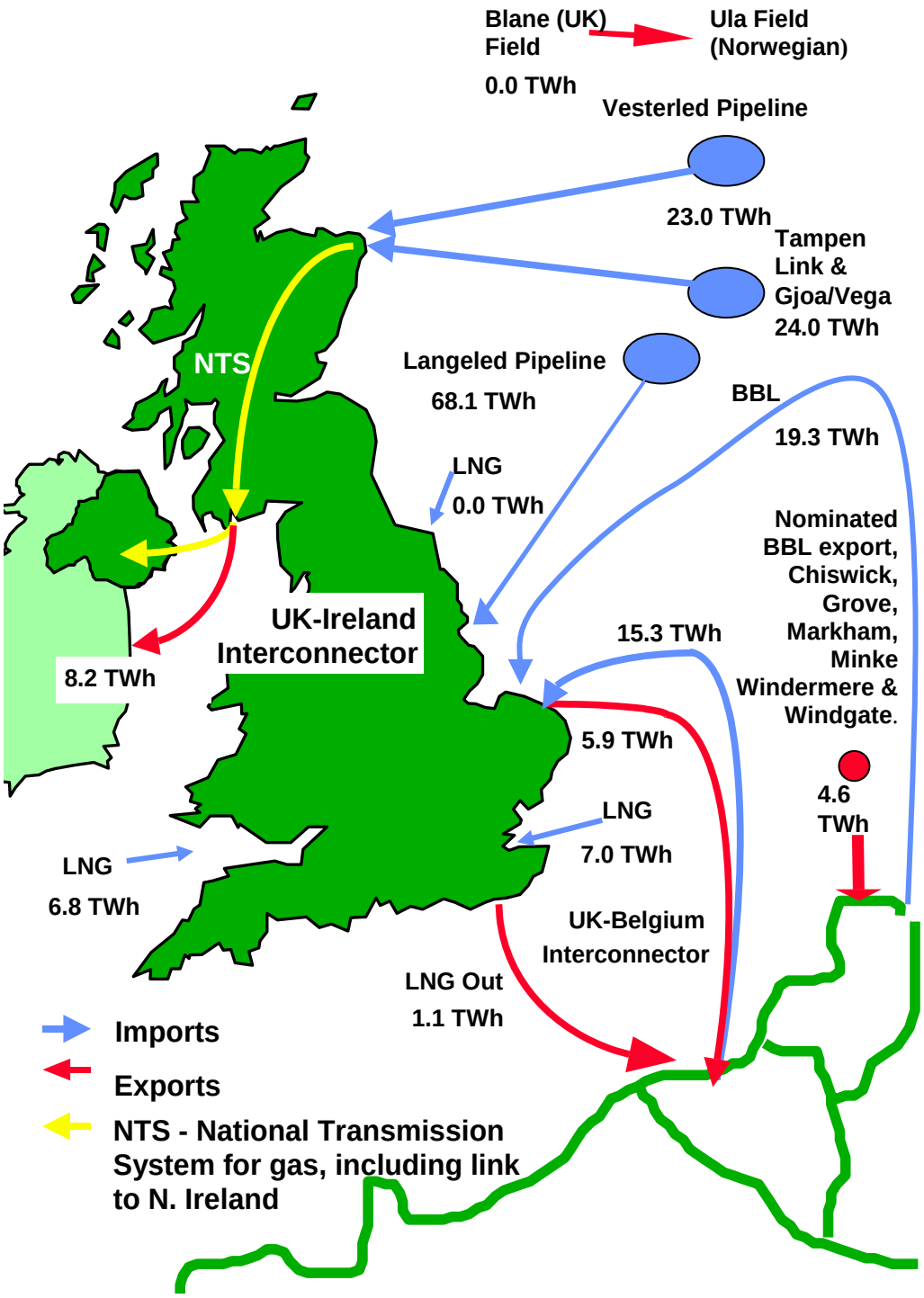
In 2016, the main development is the contraction in the amount of LNG imported into the UK. LNG's share of imports decreased (from 31 per cent to 24 per cent) with imports from Norway and the Netherlands increasing, the latter breaking a downward trend since 2014. Norway remains the principal source of UK gas imports at 64 per cent.

The majority of LNG imports are sourced from Qatar, around 79 per cent in Q4 2016. This is significantly lower than the overall 2016 figure from Qatar of 92 per cent. Imports from Qatar decreased from 38 TWh in Q4 2015 to 11 TWh in Q4 2016, a 71 per cent fall. This is due to increased demand in Northeast Asia for Qatar gas following the temporary shutdown of a number of nuclear facilities across the region coinciding with the start of the peak winter demand. LNG prices therefore increased in the Asia market, consequently diverting supply from the European market.

Pipeline imports from the Netherlands in Q4 2016 up by 97 per cent compared to Q4 2015, though the Netherlands' Q4 2015 figure was the lowest seen since 2006. Imports in the last quarter of 2016 from Norway were up 29% compared to 2015. Whereas Belgium had no pipeline exports to the UK in Q4 2015, Q4 2016 saw this increase to 14 TWh of pipeline imports, the highest Q4 pipeline import figure from Belgium since 2000.

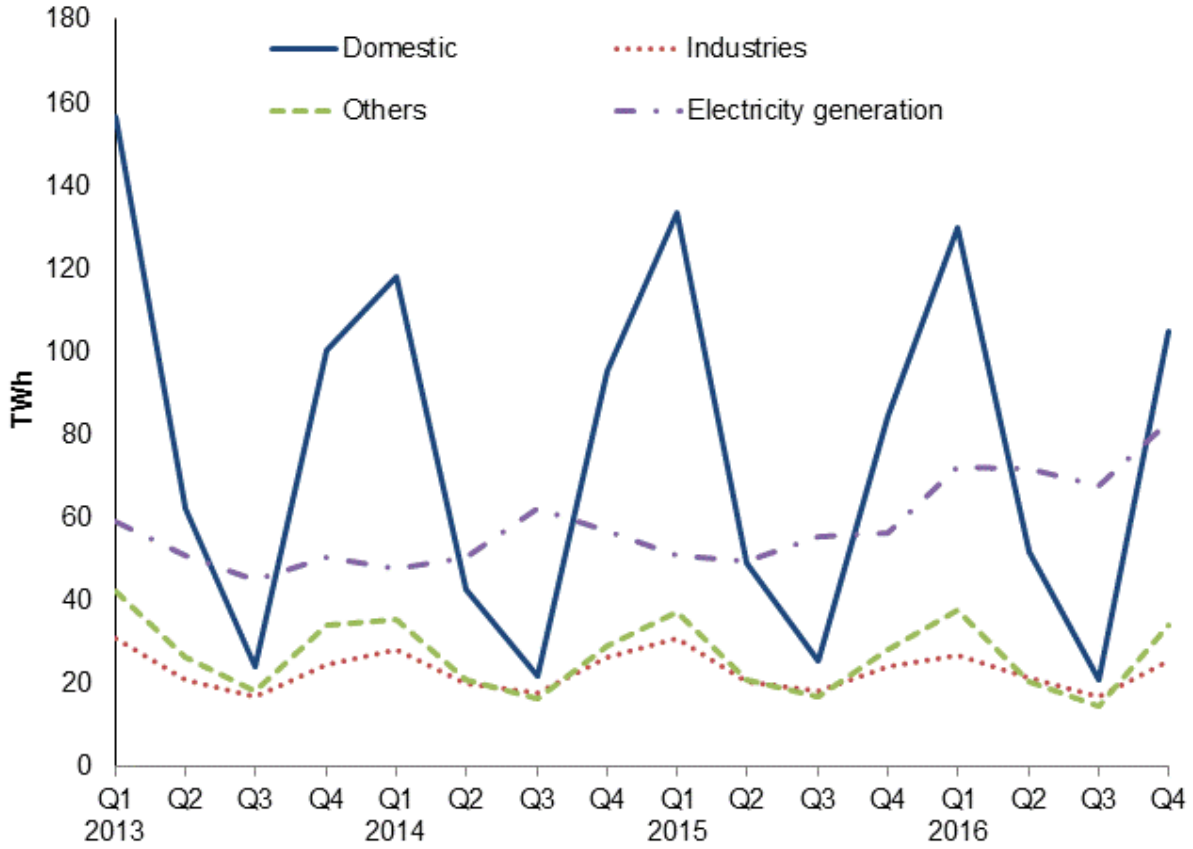
A complete country breakdown for physical pipeline and LNG imports is provided in Energy Trends table 4.4 - *Supplementary information on the origin of UK gas imports*.

Map: UK imports and exports of gas Q4 2016*



*Please note that imports and exports in this map uses nominated flows through the UK-Belgium Interconnector and BBL pipeline as in table 4.1. The figures here will differ from those in ET Table 4.3 which uses actual physical flows through the Interconnector.

Chart 4.6 UK demand for natural gas



In 2016, the UK's gas demand was up 12.6 per cent compared to 2015. Demand for gas in electricity generation was up by 38.8 per cent year-on-year as a result of less coal generation. Gas demand for domestic and other final users increased by 5.1 and 4.0 per cent respectively, reflecting the record warm temperatures in Q4 2015.

UK demand for natural gas in Q4 2016 was up 25.2 per cent in comparison to the same quarter last year. The principal cause of this is the rise in gas use for electricity generation, up by nearly half in comparison to Q4 2015, again as a result of less coal generation.

Final consumption of gas is up 19.9 per cent compared to Q4 2015. Within this consumption by domestic, other final users and other industries were all up by 23.9, 21.8 and 5.6 per cent. These increases were driven by colder temperatures, with the coldest November since 2010 and a December substantially colder than last year.

A complete breakdown for gas demand is provided in Energy Trends table 4.1 - *Natural gas supply and consumption*.

4 GAS

Table 4.1. Natural gas supply and consumption

GWh

	2015	2016 p	*per cent change*	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter	2016 2nd quarter	2016 3rd quarter	2016 4th quarter p	*per cent change* [1]
SUPPLY													
Indigenous production	460,268	476,744	*+3.6*	109,116	114,776	120,931	102,315	122,246	122,011	115,328r	113,089r	126,316	*+3.3*
Imports	492,382	521,586	*+5.9*	139,141	156,690	92,828	102,270	140,594	159,542	111,624	87,036	163,384	*+16.2*
of which LNG	*152,397*	*121,952*	*-20.0*	*27,046*	*35,602*	*36,565*	*39,242*	*40,988*	*36,466*	*35,523*	*36,245*	*13,718*	*-66.5*
Exports	161,575	124,866	*-22.7*	24,049	28,105	39,789	52,520	41,161	20,518	*29,692*	*54,938*	19,718	*-52.1*
Stock change [2]	+3,515	+19,718		5,754	34,500	-11,042	-15,919	-4,024	31,688	-8,669	-5,563	2,261	
Transfers	-420	-344		-66	-92	-96	-99	-132	-127	-106	-64	-47	
Total supply	794,170	892,838	*+12.4*	229,896	277,768	162,832	136,047	217,523	292,596r	188,485r	139,560r	272,196	*+25.1*
Statistical difference	1,823	1,039		-422	649	170	258	746	5r	520r	-365r	879	
Total demand	792,346	891,799	*+12.6*	230,318	277,119	162,661	135,789	216,777	292,590r	187,965r	139,925r	271,318	*+25.2*
TRANSFORMATION	237,957	320,433	*+34.7*	64,173	59,266	55,370	60,259	63,063	80,538r	77,335r	72,674r	89,887	*+42.5*
Electricity generation	212,556	295,032	*+38.8*	56,961	51,144	49,713	55,338	56,361	72,416r	71,679r	67,753r	83,185	*+47.6*
Heat generation [3]	25,401	25,401	-	7,212	8,122	5,656	4,921	6,702	8,122	5,656	4,921	6,702	-
Energy industry use	57,580	59,468	*+3.3*	13,482	14,651	15,534	13,079	14,315	16,273r	15,125r	13,046r	15,024	*+5.0*
Losses	6,500	5,934	*-8.7*	1,667	1,438	1,115	1,834	2,114	1,136r	1,380r	1,626r	1,793	*-15.2*
FINAL CONSUMPTION	490,309	505,963	*+3.2*	150,995	201,763	90,643	60,618	137,285	194,643r	94,126r	52,580r	164,615	*+19.9*
Iron & steel	5,374	4,265	*-20.7*	1,375	1,589	1,454	1,224	1,108	1,191	1,016	998	1,059	*-4.4*
Other industries	89,088	87,089	*-2.2*	25,204	29,532	19,291	17,118	23,146	25,925r	20,568r	16,152r	24,444	*+5.6*
Domestic	292,417	307,207	*+5.1*	95,204	133,307	49,034	25,510	84,565	129,681r	52,004r	20,787r	104,735	*+23.9*
Other final users	98,163	102,136	*+4.0*	27,854	36,019	19,547	15,448	27,149	36,530r	19,222r	13,325r	33,059	*+21.8*
Non energy use [3]	5,267	5,267	-	1,357	1,317	1,317	1,317	1,317	1,317	1,317	1,317	1,317	-

1. Percentage change between the most recent quarter and the same quarter a year earlier.

2. Stock change + = stock draw, - = stock build.

3. For heat generation and non energy use, the 2016 figures currently shown are the 2015 figures carried forward - these will be updated in July 2017.

Section 5 - Electricity

Key results show:

Provisional 2016
Electricity generated in 2016 fell by 0.2 per cent from 339.1 TWh in 2015 to 338.6 TWh. (**Chart 5.1**)

Gas' share of generation increased from 29.5 per cent to 42.4 per cent. Coal's share of generation decreased from 22.3 per cent to 9.1 per cent with a record low generation of 30.7 TWh as a result of a reduction in coal capacity, the closure of coal sites and the conversion of a unit at Drax from coal to high-range co-firing (85% to <100% biomass). Furthermore, production favours supply from gas partly due to the carbon price per GWh being higher for coal. (**Chart 5.2**)

Renewables' share of electricity generation fell from 24.6 per cent in 2015 to 24.4 per cent in 2016 due to lower wind speeds, less rainfall and fewer sun hours. (**Chart 5.2**)

Low carbon electricity's share of generation increased marginally from 45.4 per cent in 2015 to 45.6 per cent in 2016. (**Chart 5.3**)

Net imports of electricity, were 17.5 TWh, making up 5.2 per cent of electricity supplied in 2016 and were down 16.2 per cent from 20.9 TWh in 2015. This fall was largely due to decreased imports from France, as a result of maintenance and damage to the interconnector in the fourth quarter of 2016. (**Chart 5.4**).

Final consumption of electricity in 2016 was 0.1 per cent higher than in 2015. Domestic consumption fell by 1.0 per cent, despite a similar average temperature to 2015. (**Chart 5.5**).

Quarter 4 2016
Electricity generated in the fourth quarter of 2016 increased by 4.9 per cent from 88.4 TWh a year earlier to 92.8 TWh (**Chart 5.1**).

Gas' quarterly share of generation increased from 29.7 per cent to 45.2 per cent, while coal's quarterly share fell from 19.7 per cent to 9.3 per cent. Nuclear's share fell from 21.1 per cent to 20.3 per cent. (**Chart 5.2**).

Renewables' share of electricity generation decreased from 26.8 per cent in the fourth quarter of 2015 to a 22.2 per cent in the fourth quarter of 2016. This was due to a fall in average wind speeds and rainfall compared to quarter four of 2015 along with outages at Drax. (**Chart 5.2**).

Low carbon electricity's share of generation decreased from 48.0 per cent in the fourth quarter of 2015 to a 42.6 per cent in the fourth quarter of 2016. (**Chart 5.3**)

Final consumption in the fourth quarter of 2016 increased by 3.3 per cent on a year earlier, and domestic sales increased by 3.2 per cent, as a result of the comparatively colder weather. **(Chart 5.6)**

Relevant tables

Contacts for further information:

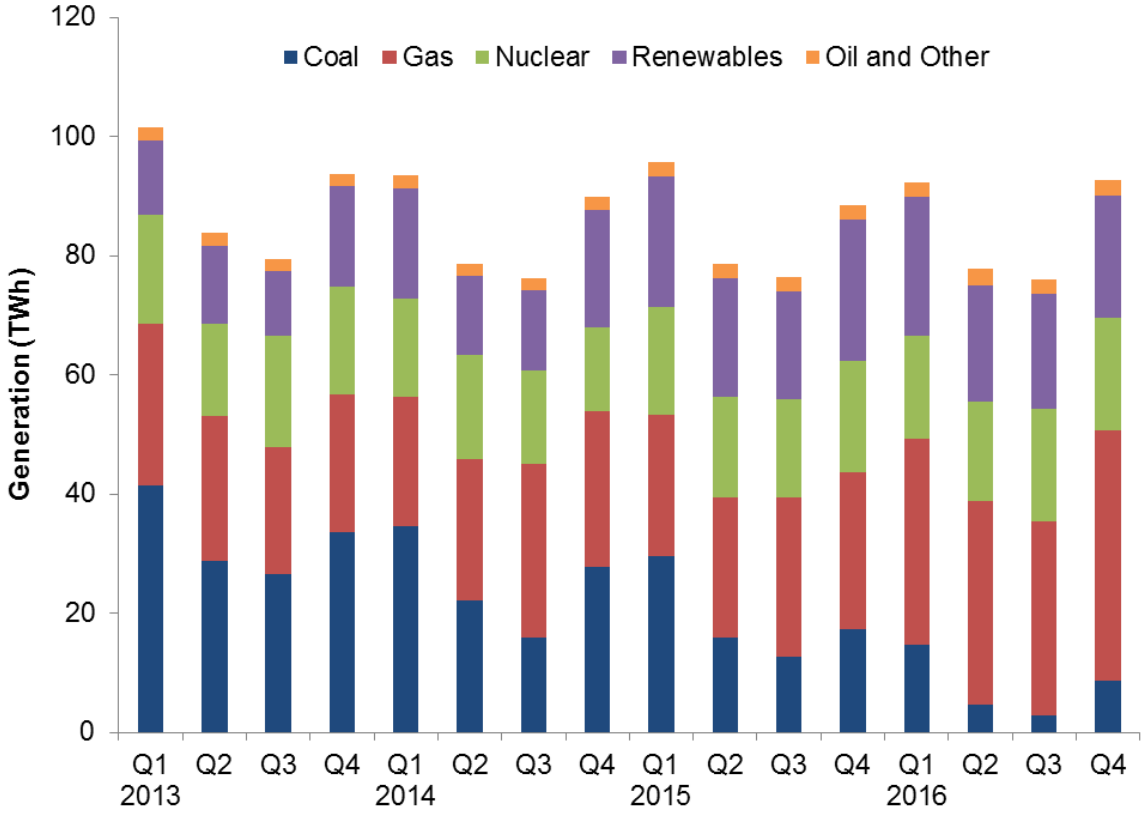
Stephen Ashcroft
Electricity Statistics
Tel: 0300 068 2928

Nick Jesson
Electricity Statistics
Tel: 0300 068 5346

Ravina Singh
Electricity Statistics
Tel: 0300 068 5046

E-mail: electricitystatistics@beis.gov.uk

Chart 5.1 Electricity generated by fuel type

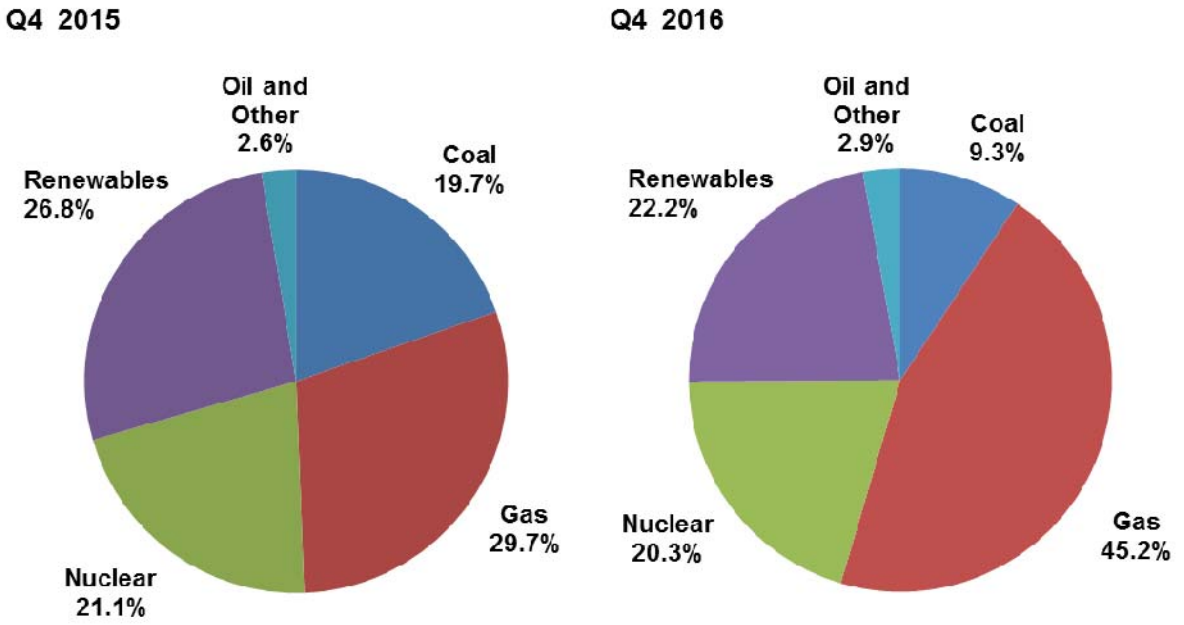


In 2016, total electricity generated fell 0.2 per cent from 339.1 TWh in 2015 to 338.6 TWh.

In 2016, coal fired generation fell by 59 per cent from 75.6 TWh in 2015 to 30.7 TWh, its lowest level in the time series, as a result of reduced coal capacity, including the closures of Ferrybridge C and Longannet in March 2016 along with the conversion of a unit at Drax from coal to high-range co-firing (85% to <100% biomass). Furthermore, production favours supply from gas partly due to the carbon price per GWh being higher for coal. Nuclear generation rose by 2.0 per cent from 70.3 TWh to 71.7 TWh. Gas fired generation increased by 43 per cent from 100.0 TWh to 143.4 TWh.

In 2016, wind and solar PV generation fell 0.2 per cent from 47.9 TWh to 47.8 TWh, mainly due to a fall in average wind speeds and sun hours compared to 2015. Hydro generation dropped 14.6 per cent from 6.3 TWh to 5.4 TWh, with average rainfall in 2016 19.4 per cent lower than a year earlier.

Chart 5.2 Shares of electricity generation



The share of generation from coal decreased from 22.3 per cent in 2015 to 9.1 per cent in 2016 with a record low generation of 30.7 TWh as a result of reduced capacity. The share of generation from nuclear increased from 20.8 per cent to 21.2 per cent in 2016, the share of generation from gas increased from 29.5 per cent in 2015 to 42.4 per cent in 2016.

The share of generation from renewables (hydro, wind & solar and bioenergy) decreased from 24.6 per cent in 2015 to 24.4 per cent in 2016.

In 2016 Q4, total electricity generated increased by 4.9 per cent from 88.4 TWh in 2015 Q4 to 92.8 TWh.

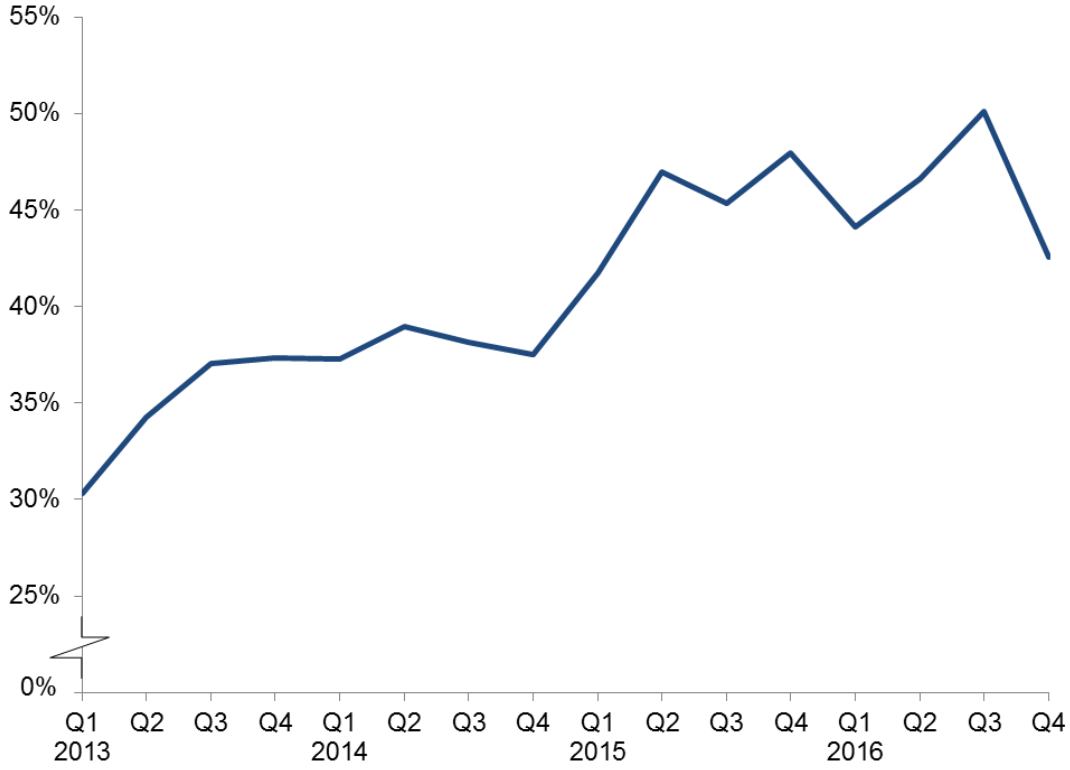
In 2016 Q4, coal fired generation fell by 50 per cent from 17.4 TWh in 2015 Q4 to 8.6 TWh. Gas fired generation increased by 60 per cent to 42.0 TWh. Nuclear generation rose from 18.7 TWh to 18.9 TWh (+1.0 per cent).

In 2016 Q4, wind and solar PV generation fell by 12.4 per cent from 13.7 TWh to 12.0 TWh. Hydro generation decreased 34 per cent from 1.8 TWh to 1.2 TWh due to a 54 per cent fall in rainfall compared with 2015 Q4.

The share of generation from coal decreased from fell from 19.7 per cent in 2015 Q4 to 9.3 per cent in 2016 Q4, while the share of generation from gas increased from 29.7 per cent to 45.2 per cent over the same period. The share of generation from Nuclear fell from 21.1 per cent in 2015 Q4 to 20.3 per cent in 2016 Q4.

The share of generation from renewables (hydro, wind and bioenergy) decreased from 26.8 per cent in 2015 Q4 to 22.2 per cent 2016 Q4. This was due to a fall of 2.7 knots in average wind speeds and a 54 per cent fall in rainfall compared to quarter four of 2015, along with outages at Drax.

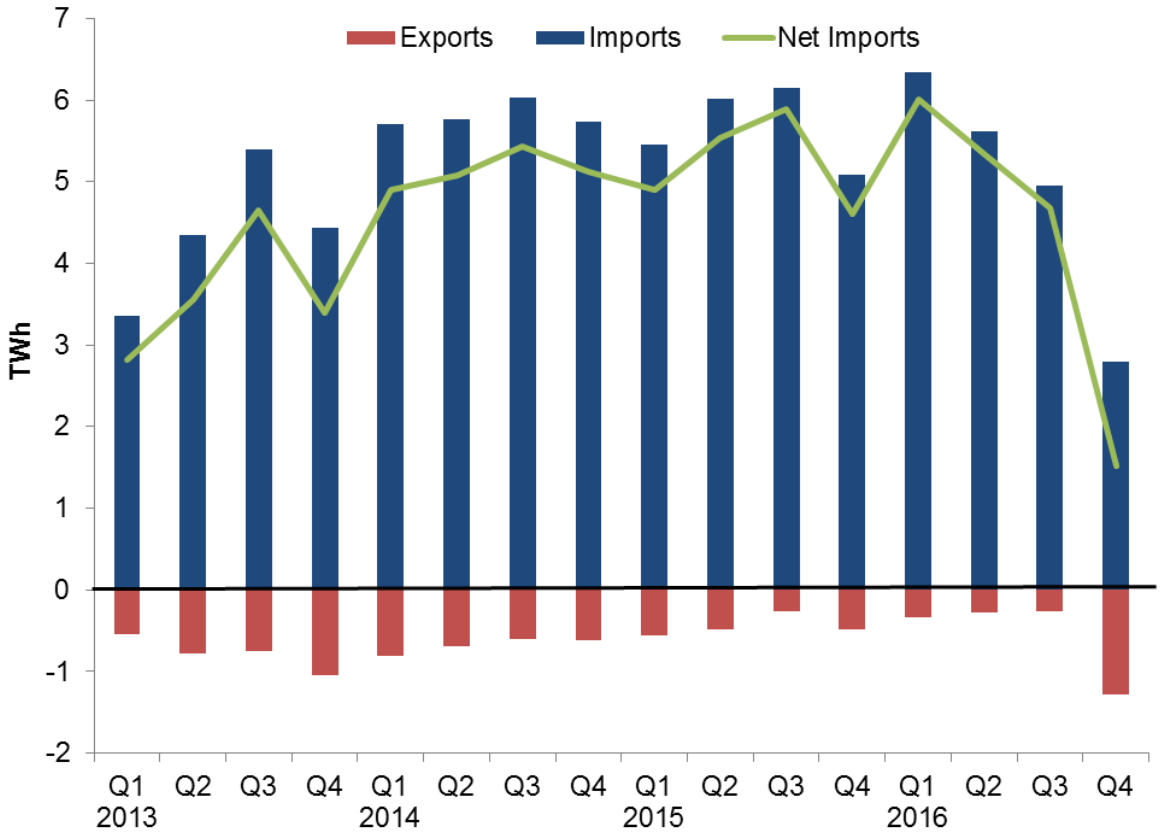
Chart 5.3 Low carbon electricity's share of generation



Low carbon electricity's share of generation increased from 45.4 per cent in 2015 to a 45.6 per cent in 2016, with nuclear generation remaining fairly constant.

Low carbon electricity's share of generation decreased from 48.0 per cent in 2015 Q4 to 42.6 per cent in 2016 Q4, due to a large fall in renewables generation compared with 2015 Q4.

Chart 5.4 UK trade in electricity



In 2016, imports of electricity fell by 13.3 per cent, whilst exports increased by 21 per cent. Net imports of electricity were 17.5 TWh, down 16.2 per cent on 2015, and accounted for 5.2 per cent of electricity supplied in 2016.

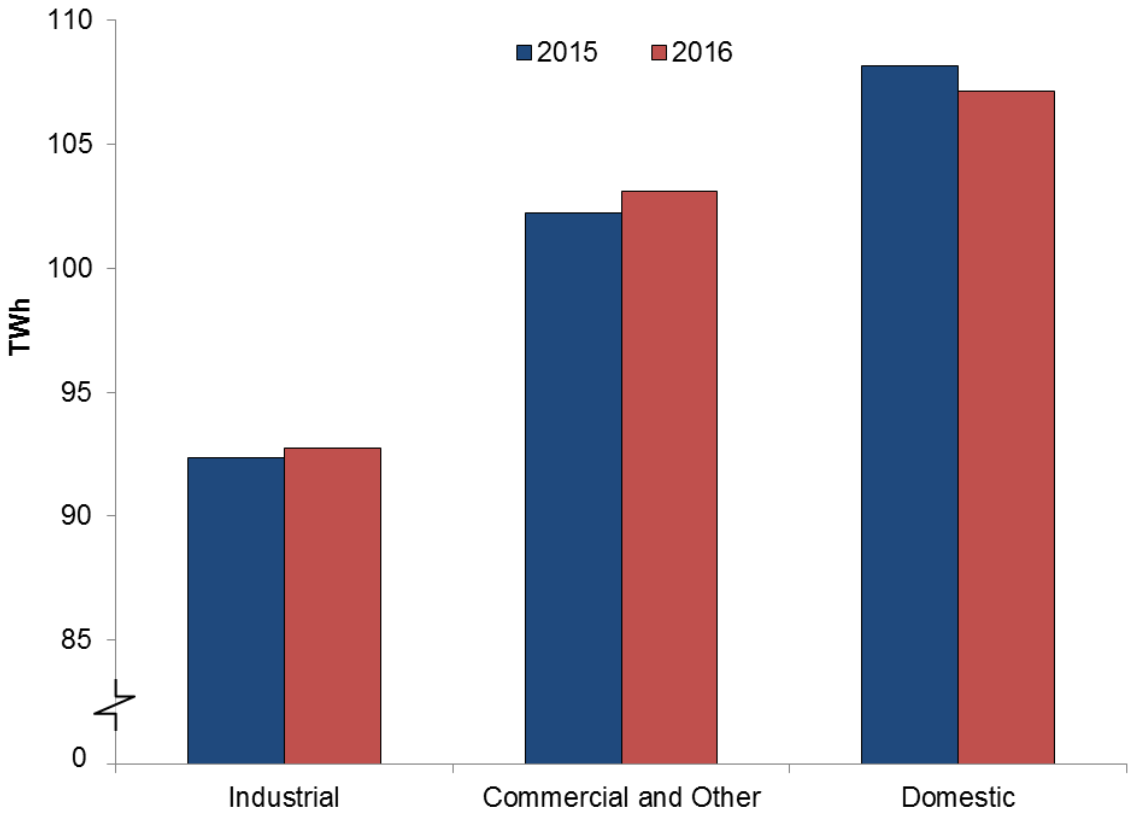
This decrease was due to a fall in imports mostly from the France and Netherlands interconnectors. In 2016 the France interconnector ran at 70.5 per cent of capacity (imports and exports combined) compared to 81.0 per cent in 2015, as a result of maintenance and damage to the interconnector in the fourth quarter of 2016. The Netherlands interconnector ran at 86.4 per cent of capacity in 2016, down from a record high 91.5 per cent in 2015.

In 2016, the UK was a net importer from France and the Netherlands with net imports of 9.7 TWh and 7.3 TWh respectively. The UK was also a net importer to Ireland, with net imports of 0.5 TWh.

In 2016 Q4, compared with the same period in 2015, imports of electricity fell by 45.0 per cent, whilst exports were over 4 and half times greater. In each of the quarters from 2010 Q2, the UK has been a net importer.

Net imports of electricity, at 1.5 TWh, were 67 per cent lower than the level of 4.6 TWh in 2015 Q4. This represented 1.7 per cent of electricity supplied in 2016 Q4. In 2016 Q4, the UK was a net importer from the Netherlands with net imports of 1.8 TWh and a net exporter to France for the first time since Q1 2010 with net exports of 0.4 TWh.

Chart 5.5 Electricity final consumption (annual)

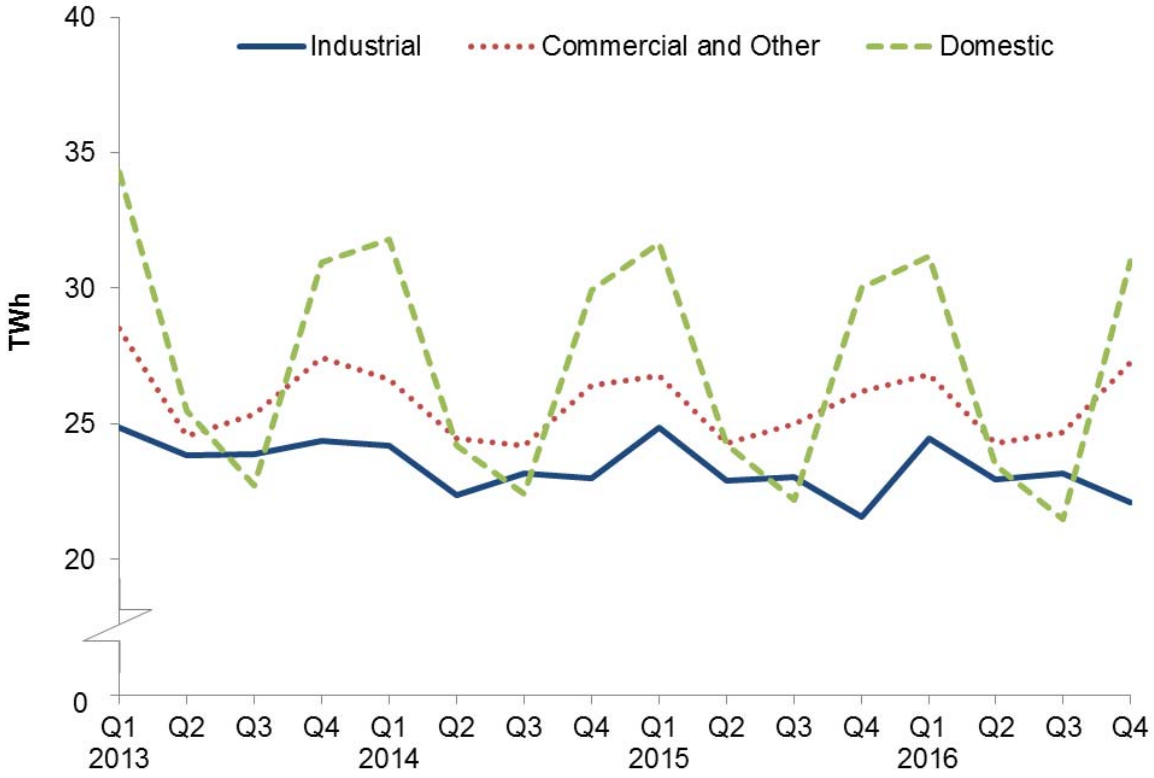


Final consumption of electricity increased slightly by 0.1 per cent in 2016, from 302.7 TWh in 2015 to 302.9 TWh.

Domestic use fell by 1.0 per cent, from 108.2 TWh in 2015 to 107.1 TWh in 2016. Industrial use of electricity increased by 0.4 per cent, from 92.3 TWh to 92.7 TWh, while consumption by commercial and other users (which includes commercial, transport and other final users) increased by 0.8 per cent, from 102.2 TWh to 103.1 TWh.

In 2016, temperatures were broadly similar on average to 2015 at 10.3 degrees Celsius – see Energy Trends table 7.1 at: www.gov.uk/government/statistics/energy-trends-section-7-weather

Chart 5.6 Electricity final consumption (quarterly)

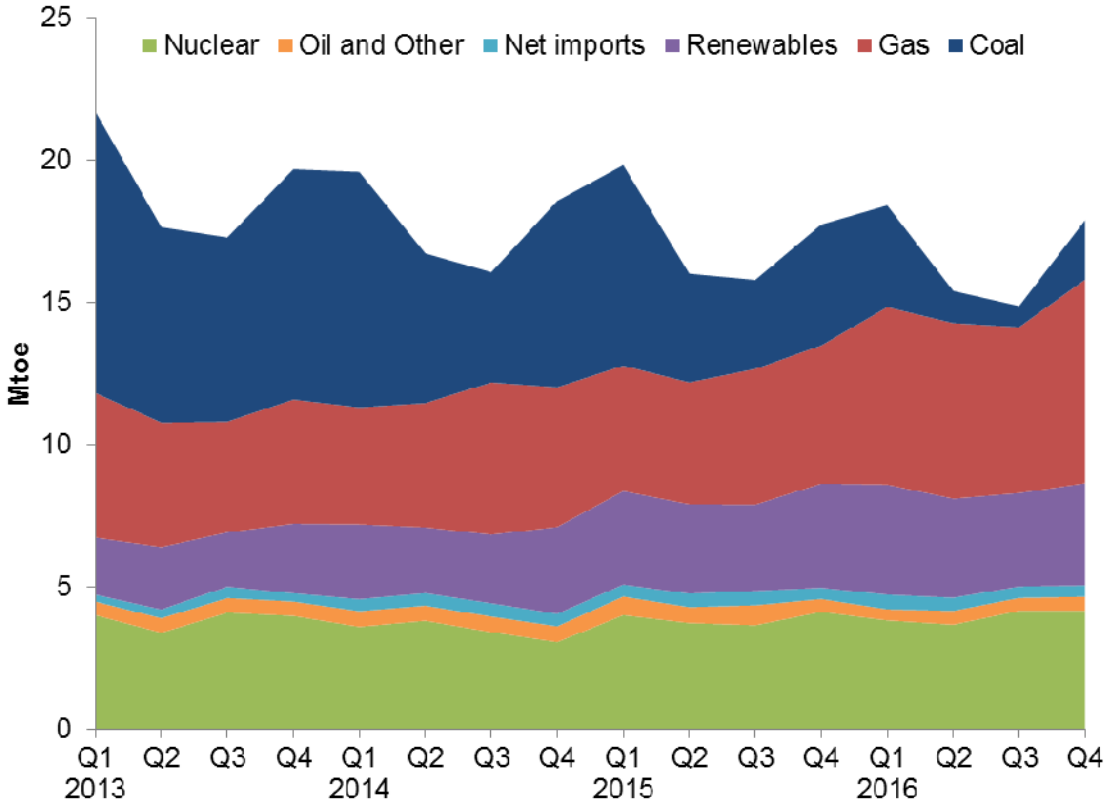


Final consumption of electricity increased by 3.3 per cent in 2016 Q4, from 77.8 TWh in 2015 Q4, to 80.4 TWh.

Domestic use increased by 3.2 per cent, from 30.0 TWh in Q4 2015 to 31.0 TWh in Q4 2016. Industrial use of electricity increased 2.6 per cent, from 21.6 TWh to 22.1 TWh, and consumption by commercial and other users rose by 4.1 per cent, from 26.2 TWh to 27.3 TWh.

The average temperature was 2.2 degrees celsius colder in the fourth quarter of 2016 compared to the same period a year earlier – see Energy Trends table 7.1 at: www.gov.uk/government/statistics/energy-trends-section-7-weather.

Chart 5.7 Fuel used for electricity generation



Fuel used by generators in 2016 fell 4.0 per cent, from 69.3 mtoe in 2015 to 66.6 mtoe (note that for wind (and other primary renewable sources), the fuel used is assumed the same as the electricity generated, unlike thermal generation where conversion losses are incurred).

In 2016, gas use was 39 per cent higher than in 2015. Coal use during 2016 was 59 per cent lower than a year earlier, while nuclear sources increased by 2.0 per cent increase on 2015 Q4.

Fuel used by generators in 2016 Q4 increased 0.9 per cent, from 17.7 mtoe in 2015 Q4 to 17.9 mtoe.

In 2016 Q4, gas use was 48 per cent higher than in 2015 Q4. Coal use during the quarter was 51 per cent lower than a year earlier, while nuclear sources slightly increased by 1.0 per cent.

5 ELECTRICITY

Table 5.1. Fuel used in electricity generation and electricity supplied

	2015	2016 p	*per cent change*	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter	2016 2nd quarter	2016 3rd quarter	2016 4th quarter p	*per cent change [1]*
FUEL USED IN GENERATION													
All generating companies									**Million tonnes of oil equivalent**				
Coal	18.26	7.54	*-58.7*	6.55	7.05	3.82	3.13	4.25	3.58	1.13	0.74	2.09	*-50.8*
Oil	0.62	0.70	*+13.3*	0.12	0.16	0.12	0.18	0.16	0.12	0.22r	0.19r	0.17	*+6.3*
Gas	18.31	25.40	*+38.7*	4.91	4.41	4.28	4.77	4.86	6.24	6.17r	5.83r	7.16	*+47.5*
Nuclear	15.48	15.78	*+2.0*	3.05	4.00	3.72	3.64	4.11	3.82	3.67	4.15	4.15	*+1.0*
Hydro	0.54	0.46	*-14.6*	0.15	0.17	0.12	0.09	0.16	0.18	0.08r	0.10r	0.10	*-33.9*
Wind and Solar [2]	4.12	4.11	*-0.2*	0.97	1.10	0.99	0.85	1.17	1.11	0.95r	1.02r	1.03	*-12.4*
Bioenergy [3]	8.46	9.65	*+14.0*	1.94	2.01	2.03	2.09	2.33	2.58	2.45r	2.16r	2.46	*+5.4*
Other fuels	1.75	1.12	*-35.9*	0.43	0.50	0.44	0.52	0.29	0.27	0.27	0.27	0.32	*+9.6*
Net imports	1.80	1.78	*-1.1*	0.44	0.42	0.48	0.51	0.40	0.52	0.46	0.40	0.40	*+1.8*
Total all generating companies	69.33	66.55	*-4.0*	18.56	19.82	16.00	15.78	17.73	18.40	15.40r	14.87r	17.89	*+0.9*
ELECTRICITY GENERATED													
All generating companies												**TWh**	
Coal	75.63	30.70	*-59.4*	27.69	29.54	15.92	12.77	17.40	14.73	4.59	2.73r	8.65	*-50.3*
Oil	2.13	2.80	*+31.3*	0.41	0.62	0.43	0.58	0.50	0.42	1.01r	0.70r	0.66	*+33.3*
Gas	100.03	143.42	*+43.4*	26.23	23.70	23.47	26.58	26.29	34.52	34.20r	32.74r	41.95	*+59.6*
Nuclear	70.34	71.73	*+2.0*	14.06	18.17	16.92	16.56	18.69	17.34	16.66	18.86	18.87	*+1.0*
Hydro (natural flow)	6.29	5.37	*-14.6*	1.75	2.01	1.43	1.03	1.82	2.08	0.94r	1.15r	1.21	*-33.9*
Wind and Solar [2]	47.87	47.80	*-0.2*	11.22	12.81	11.48	9.93	13.66	12.90	11.03r	11.90r	11.97	*-12.4*
- of which, Offshore [6]	17.42	16.41	*-5.8*	4.69	4.68	3.58	3.41	5.76	5.15	3.26r	3.58r	4.42	*-23.2*
Bioenergy [3]	29.39	29.59	*+0.7*	6.69	7.00	7.06	7.10	8.24	8.36	7.62r	6.14r	7.47	*-9.3*
Pumped Storage	2.74	2.96	*+8.0*	0.79	0.72	0.65	0.65	0.71	0.76	0.69r	0.69r	0.82	*+14.2*
Other fuels	4.66	4.22	*-9.5*	1.01	1.20	1.16	1.18	1.12r	1.06r	0.97r	1.02r	1.17	*+3.9*
Total all generating companies	339.10	338.58	*-0.2*	89.85	95.78	78.52	76.37	88.43	92.18	77.70r	75.94r	92.77	*+4.9*
ELECTRICITY SUPPLIED [4]													
All generating companies												**TWh**	
Coal	71.75	29.13	*-59.4*	26.26	28.03	15.11	12.11	16.50	13.97	4.35	2.59r	8.21	*-50.3*
Oil	1.94	2.56	*+32.0*	0.37	0.57	0.39	0.53	0.45	0.38	0.93r	0.64r	0.61	*+35.8*
Gas	98.16	140.89	*+43.5*	25.74	23.26	23.01	26.08	25.81	33.96	33.59r	32.14r	41.19	*+59.6*
Nuclear	63.89	65.15	*+2.0*	12.77	16.51	15.37	15.04	16.98	15.75	15.13	17.13	17.14	*+1.0*
Hydro	6.24	5.32	*-14.7*	1.74	2.00	1.41	1.02	1.81	2.06	0.93r	1.14r	1.19	*-34.0*
Wind and Solar [2]	47.87	47.80	*-0.2*	11.22	12.81	11.48	9.93	13.66	12.90	11.03r	11.90r	11.97	*-12.4*
- of which, Offshore [6]	17.42	16.41	*-5.8*	4.69	4.68	3.58	3.41	5.76	5.15	3.26r	3.58r	4.42	*-23.2*
Bioenergy [3]	25.53	25.67	*+0.6*	5.80	6.07	6.12	6.16	7.17	7.29	6.63r	5.29r	6.47	*-9.8*
Pumped Storage (net supply) [5]	-0.98	-1.07	*+8.6*	-0.26	-0.25	-0.23	-0.25	-0.25	-0.27	-0.26r	-0.23r	-0.30	*+21.6*
Other fuels	4.32	3.89	*-9.8*	0.94	1.11	1.07	1.09	1.04	0.98	0.89r	0.94r	1.08	*+3.8*
Net imports	20.94	17.55	*-16.2*	5.12	4.91	5.54	5.89	4.60	6.00	5.35	4.68	1.51	*-67.1*
Total all generating companies	339.65	336.89	*-0.8*	89.71	95.00	79.28	77.60	87.77	93.02	78.56r	76.22r	89.08	*+1.5*

1. Percentage change between the most recent quarter and the same quarter a year earlier.

2. Includes wave and tidal

3. Up to 2006 Q4, this includes non-biodegradable wastes. From 2007 Q1, this is included in 'Other fuels' (as it is not considered a renewable source).

4. Electricity supplied net of electricity used in generation

5. Net supply from pumped storage is usually negative, as electricity used in pumping is deducted.

6. This now includes a small amount of offshore wind generation from other generators

5 ELECTRICITY

Table 5.2 Supply and consumption of electricity

GWh

	2015	2016 p	*Per cent change*	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter	2016 2nd quarter	2016 3rd quarter	2016 4th quarter p	*Per cent change* [1]
SUPPLY													
Indigenous production	339,096r	338,585	*-0.2*	89,851	95,781r	78,518	76,372r	88,425	92,176r	77,705r	75,938r	92,766	*+4.9*
Major power producers [2 3]	293,003	289,263	*-1.3*	79,522	84,255	66,555	64,840	77,353	80,534r	65,392r	62,981r	80,356	*+3.9*
Auto producers	43,353	46,363	*+6.9*	9,535	10,803r	11,313	10,879r	10,358r	10,879r	11,624r	12,265r	11,595	*+11.9*
Other sources [4]	2,739	2,959	*+8.0*	793	723	650	653	714	762	689	693	815	*+14.2*
Imports	22,716	19,699	*-13.3*	5,737	5,462	6,023	6,152	5,080	6,334	5,622	4,951	2,792	*-45.0*
Exports	1,778	2,153	*+21.1*	618	555	484	259	480	331	275	268	1,279	*(+)*
Transfers	-	-		-	-	-	-	-	-	-	-	-	
Total supply	360,034	356,131	*-1.1*	94,970	100,688r	84,056	82,265r	93,025	98,180r	83,051r	80,620r	94,280	*+1.3*
Statistical difference	1,671	-1,182		-153	502r	419	286r	464	-430r	-314r	-242r	-195	
Total demand	358,363	357,313	*-0.3*	95,123	100,186	83,637	81,979	92,560	98,610r	83,365r	80,863r	94,475	*+2.1*
TRANSFORMATION	-	-		-	-	-	-	-	-	-	-	-	
Energy industry use [5]	28,160	26,913	*-4.4*	7,278	7,603	6,677	6,662	7,218	7,033r	6,362r	6,341r	7,176	*-0.6*
Losses	27,458	27,461	*-*	8,521	9,307	5,525	5,088	7,538	9,088r	6,278r	5,183r	6,912	*-8.3*
FINAL CONSUMPTION	302,745	302,939	*+0.1*	79,324	83,276	71,436	70,229	77,805	82,488r	70,725r	69,339r	80,387	*+3.3*
Iron & steel	3,688	3,487	*-5.4*	949	990	935	887	875	868	864	867r	888	*+1.5*
Other industries	88,659	89,242	*+0.7*	22,027	23,872	21,951	22,143	20,693	23,617r	22,106r	22,285r	21,234	*+2.6*
Transport	4,476	4,476	*-*	1,126	1,119	1,119	1,119	1,119	1,119	1,119	1,119	1,119	*-*
Domestic	108,157	107,118	*-1.0*	29,929	31,657	24,257	22,214	30,029	31,167	23,485r	21,483r	30,983	*+3.2*
Other final users	97,765	98,617	*+0.9*	25,293	25,637	23,173	23,866	25,089	25,717	23,152	23,585r	26,163	*+4.3*
Non energy use	-	-		-	-	-	-	-	-	-	-	-	

1. Percentage change between the most recent quarter and the same quarter a year earlier.

2. Companies that produce electricity from nuclear sources plus all companies whose prime purpose is the generation of electricity are included under the heading "Major Power Producers". At the end of December 2015 they were:

AES Electric Ltd., Anesco Ltd., Baglan Generation Ltd., British Energy plc., British Solar Renewables Ltd., Centrica Energy, Centrica Renewable Energy Ltd., CEP Wind 2, Coolkeeragh ESB Ltd., Corby Power Ltd., Coryton Energy Company Ltd., Cubic Sustainable Investments Ltd., Deeside Power Development Company Ltd., DONG Energy Burbo UK Ltd., Drax Power Ltd., EDF Energy plc., EDF Energy Renewables Ltd., Eggborough Power Ltd., E.On UK plc., Eneco Wind UK Ltd., Energy Power Resources, Falck Renewables Ltd., Fellside Heat and Power Ltd., First Hydro Company., Greencoat UK Wind plc., Immingham CHP, Infinis plc., International Power Mitsui, Lark Energy Ltd., Lightsource Renewable Energy Ltd., London Waste Ltd., Lynemouth Power Ltd., Magnox North Ltd., Marchwood Power Ltd., Peel Energy Ltd., Premier Power Ltd., Riverside Resource Recovery Ltd., Rocksavage Power Company Ltd., RWE Innogy Markinch Ltd., RWE Npower plc., Saltend Cogeneration Company Ltd., Scira Offshore Energy Ltd., Scotia Wind (Craigengelt) Ltd., Scottish Power plc., Scottish and Southern Energy plc., Seabank Power Ltd., SELCHP Ltd., Sembcorp Utilities (UK) Ltd., Severn Power Ltd., Slough Heat and Power Ltd., Spalding Energy Company Ltd., Statkraft Energy Ltd., Statkraft Wind UK Ltd.,Third Energy Trading Ltd.

3. This table includes the change of definition of Major power producers (MPPs) to include major wind farm companies. Details of this change of definition were given in an article on pages 43 to 48 of the September 2008 edition of Energy Trends.

4. Gross supply from pumped storage hydro.

5. Includes electricity used in generation and for pumping, along with energy used by other fuel industries (including coal and coke, blast furnaces, extraction of oil and gas, petroleum refiniries, nuclear fuel production and gas and electricity supply) .

Section 6 - Renewables

Key results show:

Provisional 2016
Renewable electricity generation in 2016 fell 1.0 per cent compared to 2015, from 83.6 TWh to 82.8 TWh. A 13.7 per cent increase in capacity over the year was out-weighed by low wind speeds and rainfall, following a very wet and windy 2015. However, 2016 was still the second highest year ever for renewable electricity generation. **(Table 6.1)**

Renewables' share of electricity generation was 24.4 per cent, a fall of 0.2 percentage points on the record 24.6 per cent in 2015, reflecting lower renewable generation, despite slightly lower overall electricity generation. **(Table 6.1 and Chart 6.1)**

In 2016, on the 2009 Renewable Energy Directive basis, normalised renewable generation (accounting for variable weather) was a record 24.3 per cent of gross electricity consumption, an increase of 2.0 percentage points on 2015's share. **(Table 6.1)**

Renewable electricity capacity was 34.7 GW at the end of 2016, a 13.7 per cent increase (4.2 GW) on a year earlier, largely due to increased solar PV and onshore wind capacity. **(Chart 6.3)**

Quarter 4 2016
Renewables' share of electricity generation was 22.2 per cent in 2016 Q4, down 4.6 percentage points on the record 26.8 per cent share in 2015 Q4, reflecting lower renewable generation and higher overall electricity generation.

Renewable electricity generation was 20.6 TWh in 2016 Q4, a fall of 13.0 per cent on the record 23.7 TWh in 2015 Q4, due to much lower wind speeds and rainfall. **(Chart 6.2)**

In 2016 Q4, 660 MW of capacity eligible for the Feed in Tariff scheme was installed, increasing the total to 6.0 GW, across 887,419 installations. **(Chart 6.5)**

Relevant tables

Contacts for further information:

James Hemingway
Renewables Statistics
Tel: 0300 068 5042

Liz Waters
Renewables Statistics
Tel: 0300 068 5735

E-mail: renewablesstatistics@beis.gov.uk

Table 6.1 Renewable electricity shares – 2015 and 2016 (provisional)

	2015	2016p
Renewable generation (TWh)	83.6	82.8
Total electricity generation (TWh)	339.1	338.6
International basis	**24.6%**	**24.4%**
Normalised renewable generation (TWh)	79.9	85.9
Gross electricity consumption (TWh)	357.3	353.2
2009 Renewable Energy Directive basis	**22.4%**	**24.3%**

In 2016, renewables' share of electricity generation fell to 24.4 per cent, from the record 24.6 per cent in 2015, due to less favourable weather conditions. Overall electricity generation fell by 0.2 per cent; this slight fall had little impact (increasing the share by less than 0.1 percentage points, although this was exceeded by the reduction in renewable generation).

Total electricity generated from renewables in 2016 was down by 1.0 per cent on 2015, from a record 83.6 TWh to 82.8 TWh. Normalised renewable generation rose from 79.9 TWh in 2015 to 85.9 TWh in 2016.

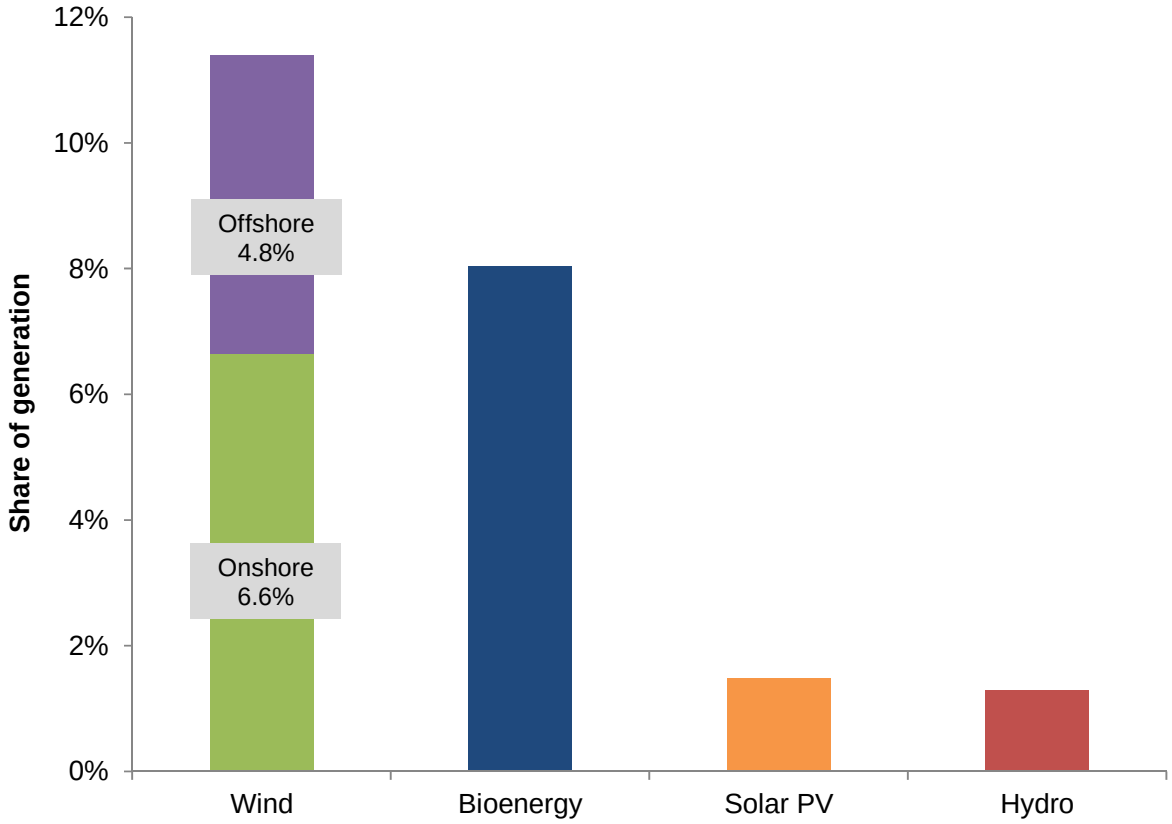
On the 2009 Renewable Energy Directive (RED) basis, the electricity share was 24.3 per cent, compared with 22.4 per cent in 2015. The RED measure uses normalised wind and hydro generation, to account for variable generation due to weather conditions. Under this measure, wind and hydro generation were increased (due to lower than average load factors in 2016), a reversal of 2015.

For more information on normalisation, and the various measures of renewable electricity's shares, please see June 2016's "Renewable energy in 2015", at:
www.gov.uk/government/statistics/energy-trends-june-2016-special-feature-article-renewable-energy-in-2015

In 2016 Q4, renewables' share of electricity generation fell by 4.6 percentage points to 22.2 per cent, from the record 26.8 in 2015 Q4. Total electricity generation and electricity demand figures (all generating companies) can be found in tables ET 5.1 and ET 5.2, at:
www.gov.uk/government/statistics/electricity-section-5-energy-trends. The fall reflects low wind speeds and rainfall in 2016 Q4, particularly when compared with the high levels of 2015 Q4.

Overall quarterly electricity generation in 2016 Q4 (92.8 TWh) was up by 4.9 per cent on a year earlier (as a result of higher demand, partly due to lower temperatures, which were on average 2.2 degrees lower than the record quarter 4 temperatures in 2015); this had a 1.1 percentage point contribution to the 4.6 percentage point decrease in the renewables share.

Chart 6.1 Renewables' share of electricity generation – 2016 Q4



In 2016, generation from offshore wind fell by 5.8 per cent, from 17.4 TWh in 2015 to 16.4 TWh. Onshore wind generation fell by 7.8 per cent, from 22.9 TWh to 21.1 TWh. This is due to much lower wind speeds than the levels experienced in 2015 (the highest in the last fifteen years); for onshore wind, this more than offset the effect of higher capacity levels.

Hydro generation fell by 15 per cent on a year earlier, from a record 6.3 TWh to 5.4 TWh, following much reduced rainfall levels (in the main hydro areas) following 2015 (the second wettest year in the last fifteen).

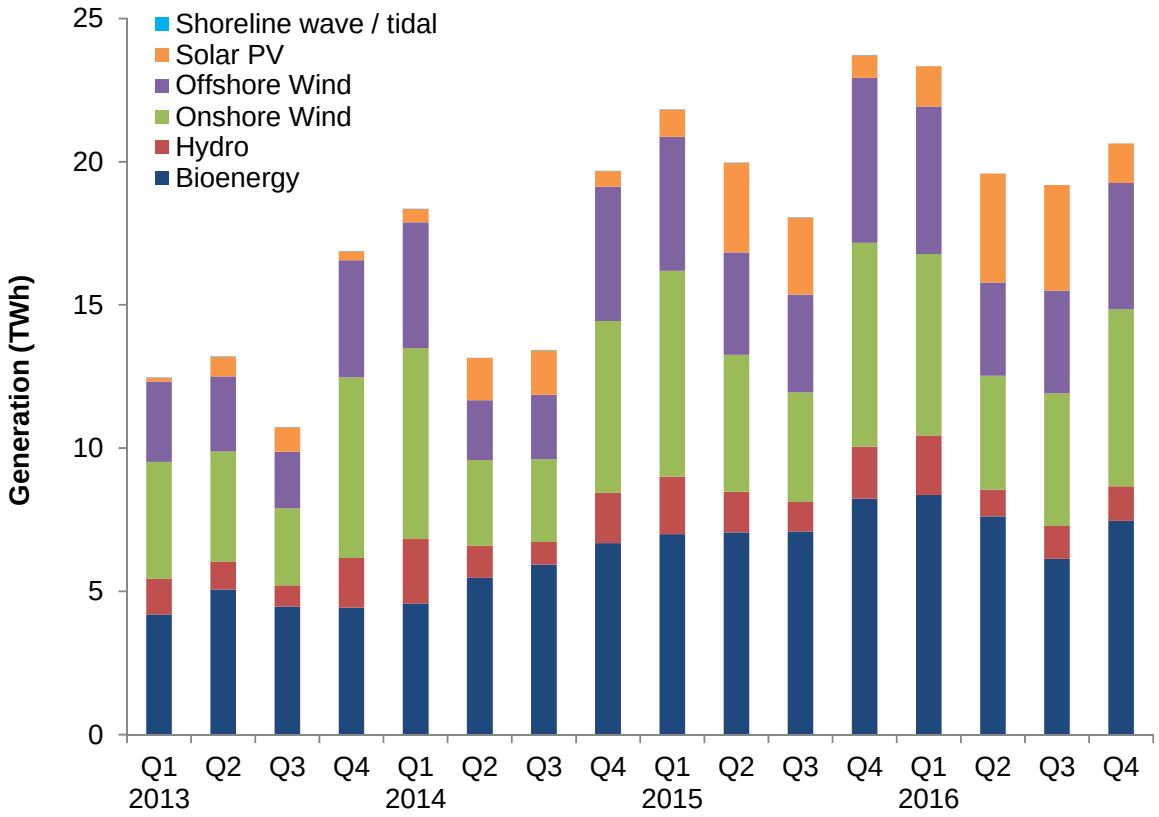
In 2016, generation from bioenergy [1] increased by 0.7 per cent, from 29.4 TWh in 2015 to a record 29.6 TWh. Within this figure, generation from anaerobic digestion increased by 31 per cent, due to increased capacity (particularly on FiTs), from 1.4 TWh to 1.9 TWh, while plant biomass increased by 1.2 per cent, from 18.6 TWh in 2015 to 18.8 in 2016. These combined increases exceeded falls in generation from biodegradable MSW (-8.0 per cent) and landfill gas (-5.2 per cent).

In 2016, 36 per cent of renewables generation was from bioenergy, 25 per cent from onshore wind, 20 per cent from offshore wind, 12 per cent from solar PV, and 6.5 per cent from hydro. The increase in solar PV's share (from 9.0 per cent) was due to a large increase in capacity.

Total electricity generation figures (all generating companies) can be found in table ET 5.1, at: www.gov.uk/government/statistics/electricity-section-5-energy-trends

[1] landfill gas, sewage gas, biodegradable municipal solid waste, plant biomass, animal biomass, anaerobic digestion and co-firing (generation only)

Chart 6.2 Renewable electricity generation



Total electricity generated from renewables in 2016 Q4 was down by 13 per cent on the record levels of 2015 Q4, from 23.7 TWh to 20.6 TWh.

Generation from solar PV rose by 73 per cent, from 0.8 TWh to 1.4 TWh, due to increased capacity across the year (and particularly that installed at the end of 2016 Q1).

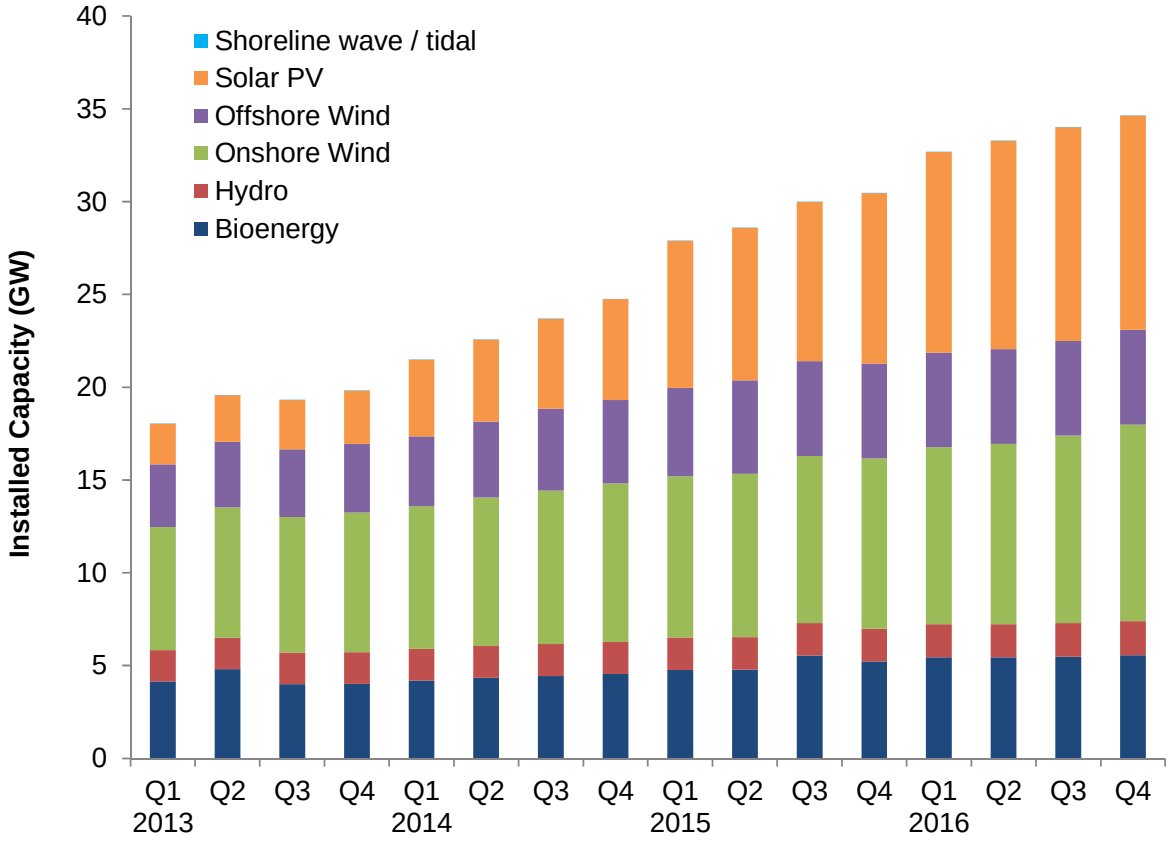
Offshore wind generation, in 2016 Q4, fell by 23 per cent on a year earlier, from 5.8 TWh to 4.4 TWh; this was due to much lower average wind speeds. Onshore wind generation in 2016 Q4 fell by 13 per cent on 2015 Q4, from 7.1 TWh to 6.2 TWh for the same reason. Average wind speeds for 2016 Q4 were the lowest for quarter 4 in the last fifteen years, 1.7 knots below the 10 year average and 2.7 knots below the same period a year earlier. October 2016 was especially calm – at 6.5 knots, it was the calmest October in the last sixteen years, and the calmest month for 25 months - see Energy Trends table 7.2 at: www.gov.uk/government/statistics/energy-trends-section-7-weather.

Generation from bioenergy fell by 9.3 per cent, from 8.2 TWh in 2015 Q4 to 7.5 TWh, due to maintenance outages at Drax's biomass units and the closure of Ironbridge in November 2015.

In 2016 Q4, hydro generation fell by 34 per cent on a year earlier to 1.2 TWh. This was due to 54 per cent less rainfall (in the main hydro areas) for the quarter compared to the same period last year (which was the wettest quarter for four years).

In 2016 Q4, bioenergy had the largest share of generation (35 per cent), with 30 per cent from onshore wind, 24 per cent from offshore wind, 7.7 per cent from hydro and 3.4 per cent from solar photovoltaics.

Chart 6.3 Renewable electricity capacity (as at end of quarter)



At the end of 2016 Q4, the UK's renewable electricity capacity totalled 34.7 GW, an increase of 14 per cent (4.2 GW) on that installed at the end of 2015 Q4, and up 1.9 per cent (0.6 GW) on that installed at the end of the previous quarter. At the end of 2016 Q4, solar photovoltaics had the highest share of capacity, at 33 per cent, followed by onshore wind (31 per cent), bioenergy (16 per cent), offshore wind (15 per cent) and hydro (at 6.3 per cent).

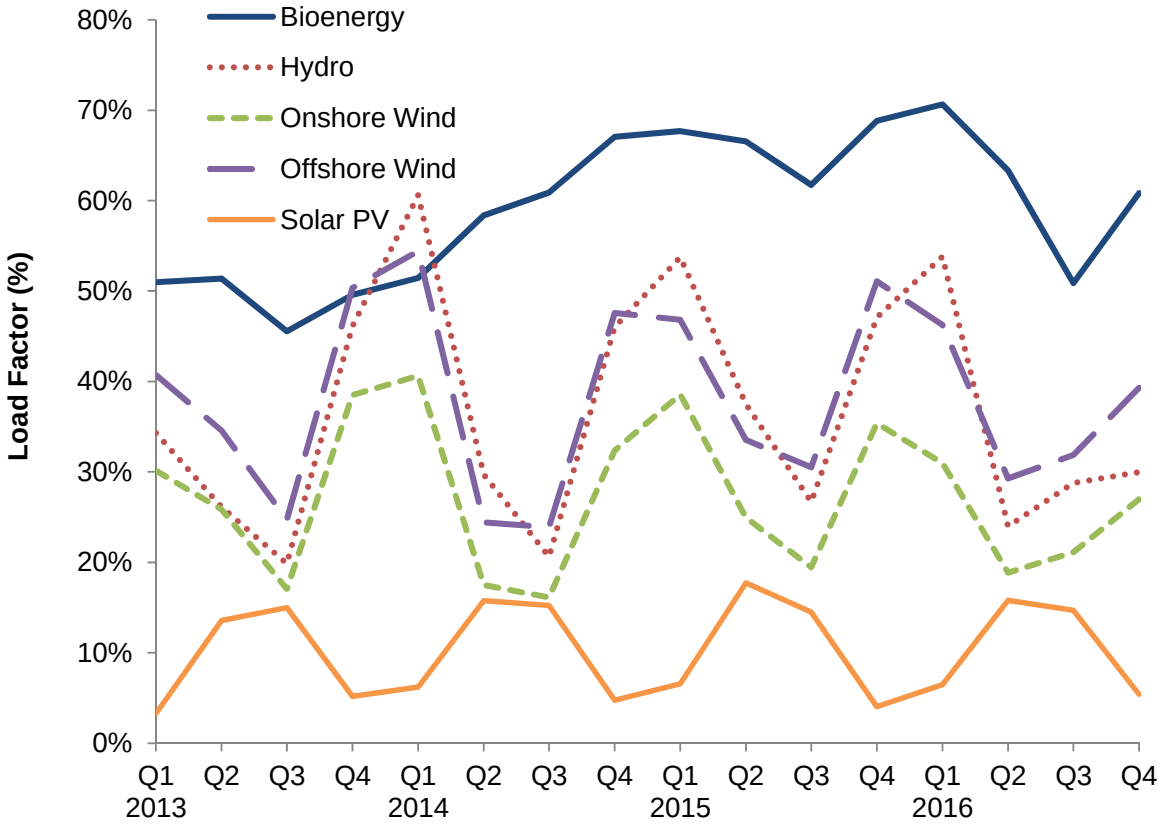
Solar PV capacity increased by 2.4 GW during 2016, with the majority of growth coming from sites accredited under the Renewables Obligation (mainly in quarter 1, ahead of the closure of the RO to grace period-qualifying large and, non-grace period qualifying[2], small, solar), as well as increases in small scale Feed in Tariff sites. [3]

During 2016, onshore wind capacity increased by 1.4 GW, with several large sites opening, or continuing to expand during the year, including Dunmaglass (94 MW), Dersalloch (69 MW) and the first 156 MW of Wales's largest onshore wind farm, Pen y Cymoedd (256 MW on completion). Offshore wind capacity fell by 10 MW with the closure of Beatrice in early 2016. Bioenergy capacity increased by 6.6 per cent (345 MW), mainly due to 223 MW of plant biomass (notably the new Brigg and Snetterton straw-fired plants).

[2] The Renewables Obligation closed to all large-scale (>5 MW) on 31 March 2015 and small-scale (up to 5 MW) solar on 31 March 2016. Certain installations meeting investment or planning criteria were given year long extensions ("grace periods") to these deadlines, with the commissioning deadline for qualifying small solar sites now 31 March 2017. Further details on RO closure and grace periods are available at:
www.ofgem.gov.uk/environmental-programmes/ro/about-ro/ro-closure

[3] To note that renewable generation and capacity figures include installations accredited on all support schemes (Renewables Obligation, Feed in Tariffs, Contracts for Difference), as well as those not eligible for support or are commissioned but awaiting support accreditation. This should particularly be noted for solar PV (and onshore wind), where figures consist of many installations across several or all of these categories.

Chart 6.4 Renewable electricity load factors



In 2016, onshore wind's load factor averaged 24.3 per cent, a 5.2 percentage point fall on 2015's seventeen-year record high 29.5 per cent, and the lowest for six years. Offshore wind's load factor fell by 4.8 percentage points, from a record 41.4 per cent to 36.6 per cent, the lowest for four years. Average onshore wind speeds in 2016, at 8.3 knots, were the lowest for four years and down 1.0 knot on a year earlier.

With 19 per cent less rainfall (in the main hydro areas) on average than a year earlier, hydro's load factor in 2016 fell by 7.1 percentage points, from a record 41.2 per cent in 2015 to 34.1 per cent.

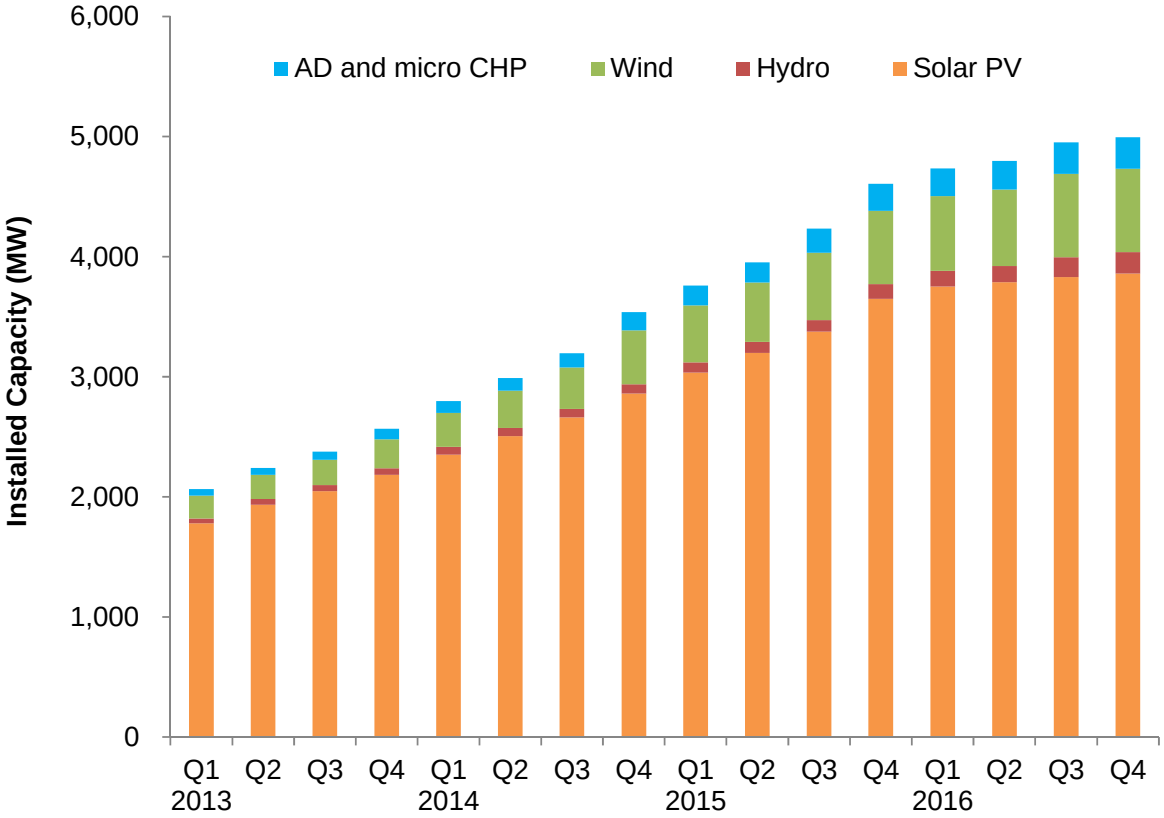
Onshore wind's load factor in 2016 Q4 stood at 27.0 per cent, an 8.4 percentage point fall on a year earlier. Offshore wind's load factor fell by 11.8 percentage points compared to 2015 Q4, from 51.1 per cent, to 39.3 per cent. Average onshore wind speeds were 26 per cent (2.7 knots) lower than a year earlier, with October 2016's wind speeds the lowest for that month in the last sixteen years. [4]

Hydro's load factor in 2016 Q4 was 30.0 per cent, a 17.1 percentage point fall on a year earlier, due to 54 per cent less rainfall, making it the driest quarter 4 in the last sixteen years. However, this was a slight (1.2 percentage point) increase in the load factor a quarter earlier.

Bioenergy's load factor rose to 60.8 per cent in 2016 Q4, from 50.9 per cent the previous quarter, as the biomass units at Drax power station returned from maintenance outages; however, this remained 8.0 percentage points lower than a year earlier when all were fully operational.

[4] Load Factors are calculated using an average of capacity at the start and end of the quarter. Therefore, they can be influenced by the time in the quarter when any new capacity came online.

Chart 6.5 Feed in Tariffs: eligible installed capacity (as at end of quarter)



At the end of 2016 Q4, 6.0 GW of capacity was installed and eligible for the GB Feed in Tariff (FiT) scheme[5]. This was an increase of 0.9 per cent (51 MW) on that installed at the end of 2016 Q3, and 12 per cent (660 MW) higher than the amount confirmed at the end of 2015 Q4.

In terms of number of installations, at the end of 2016 Q4, there were 887,419 installed and eligible for the FiT scheme, a 1.0 per cent increase on the 878,791 installed at the end of the previous quarter, and a 6.8 per cent increase on the 830,916 installed a year earlier.

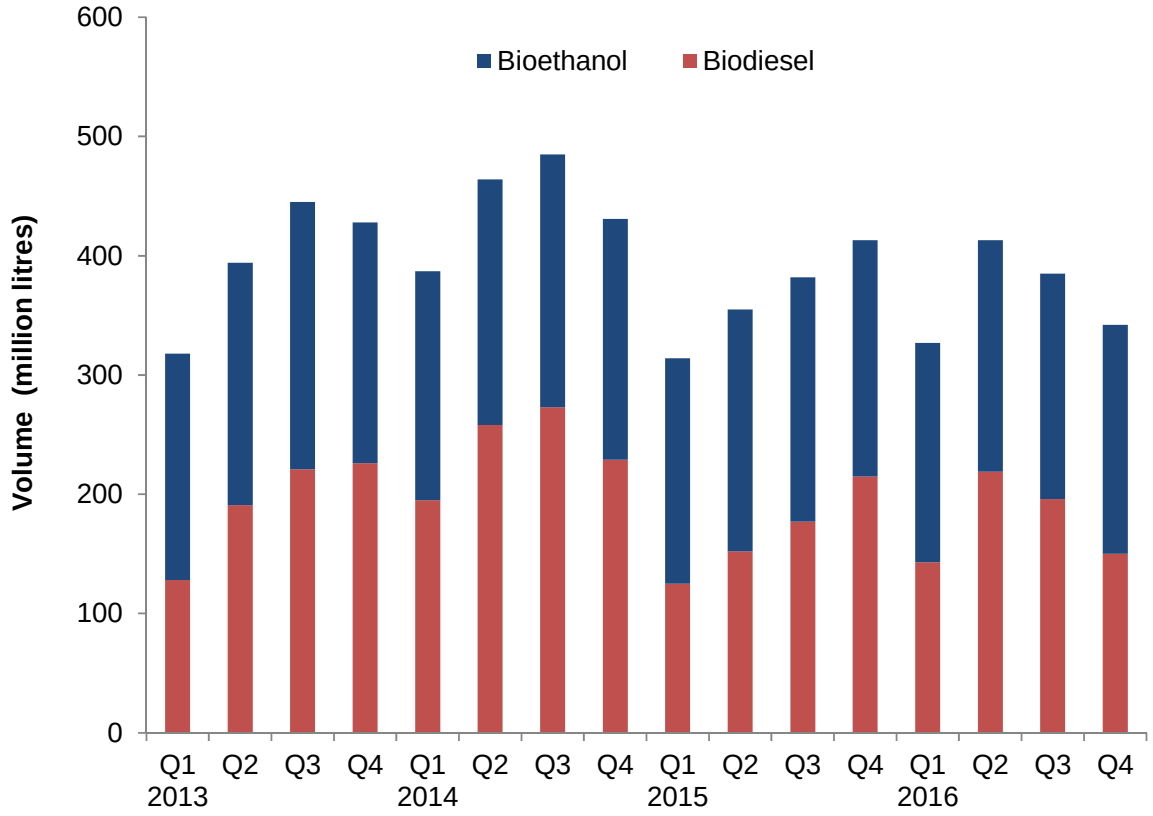
Solar photovoltaics (PV) represent the majority of both installations and installed capacity confirmed on FiTs, with, respectively, 99 per cent and 81 per cent of the total.

Renewable installations eligible for FiTs (all except Micro CHP) represented 17 per cent of all renewable installed capacity.

Statistics on Feed in Tariffs can be found at:
www.gov.uk/government/collections/feed-in-tariff-statistics

[5] Data are for schemes accredited under the Microgeneration Certification Scheme (MCS) and ROOFIT, which are pre-requisites for registering for the FIT scheme; not all of these installations will eventually be confirmed onto the FIT scheme.

Chart 6.6 Liquid biofuels for transport consumption



In 2016, 1,467 million litres of liquid biofuels were consumed in transport, an increase of 0.2 per cent on 2015's 1,464 million litres. Bioethanol consumption fell by 4.5 per cent, from 795 million litres to 759 million litres. Biodiesel consumption rose by 5.8 per cent, from 669 million litres in 2015 to 708 million litres in 2016.

In 2016, bioethanol contributed 52 per cent of biofuel consumption, compared with 48 per cent from biodiesel. Although bioethanol retains the majority held in 2015, two percentage points have switched from bioethanol (54 per cent in 2015) to biodiesel (46 per cent in 2015).

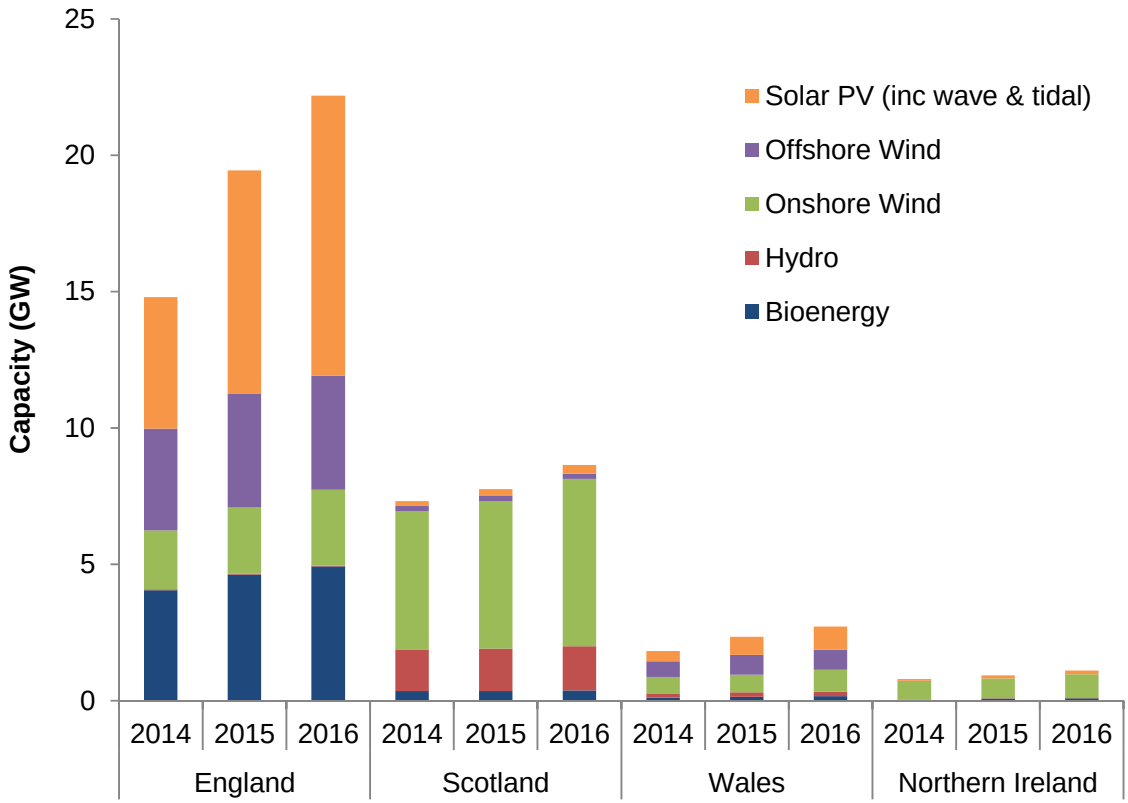
In 2016, in volume terms, bioethanol accounted for 4.4 per cent of motor spirit, and biodiesel 2.2 per cent of total diesel; the combined contribution was 3.1 per cent, 0.1 percentage point less than in 2015.

In 2016 Q4, 342 million litres of liquid biofuels were consumed in transport, a fall of 17 per cent on the 413 million litres in 2015 Q4. Biodiesel consumption fell by 30 per cent, from 215 million litres to 150 million litres, the lowest for Q4 for four years. Bioethanol consumption in 2016 Q4 fell by 3.0 per cent, from 196 million litres, to 192 million litres, the lowest figure for Q4 in five years.

In 2016 Q4, biodiesel accounted for 1.9 per cent of diesel, and bioethanol 4.5 per cent of motor spirit. The combined contribution of the two fuels was 2.8 per cent, a fall of 0.7 percentage points on 2015 Q4's figure of 3.5 per cent.

In 2016 Q4, the largest share of consumption was from bioethanol (56 per cent), with the remaining 44 per cent coming from biodiesel, a reversal of 2015 Q4's shares of 48 per cent and 52 per cent respectively.

Chart 6.7 Renewable electricity capacity, by UK country



At the end of 2016, England's renewable electricity capacity was 22.2 GW, an increase of 14 per cent (2.7 GW) on that at the end of 2015, with solar (2.1 GW), onshore wind (0.4 GW) and bioenergy (0.3 GW) being the main contributors to the increase.

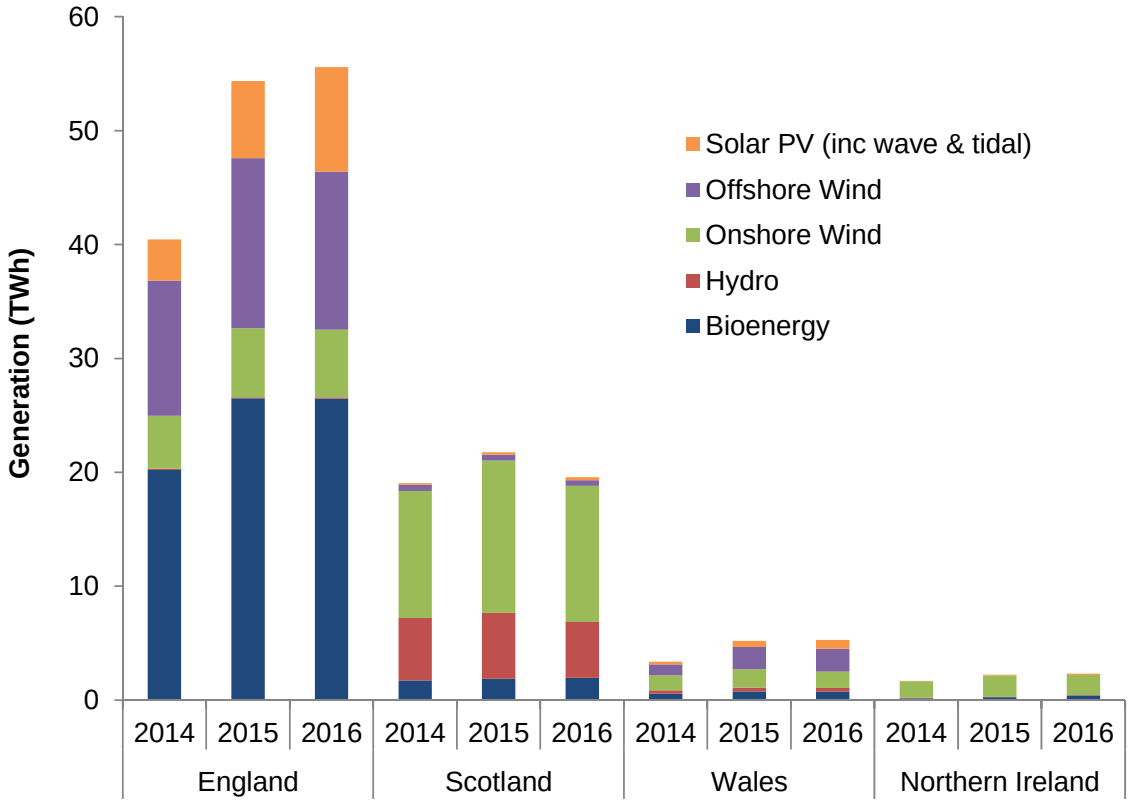
Scotland's capacity was 8.6 GW, an increase of 11 per cent (0.9 GW), the majority of which was due to increased onshore wind capacity.

Wales's capacity was 2.7 GW, an increase of 16 per cent (0.4 GW) on that at the end of 2015, with just over half of the increase due to additional solar PV capacity, and just under one half due to onshore wind, primarily the Pen y Cymoedd site. Northern Ireland's capacity was 1.1 GW, an increase of 20 per cent (0.2 GW), with 81 per cent of this increase attributable to new onshore wind farms.

At the end of 2016, England accounted for 64 per cent of UK renewable electricity capacity; Scotland's share was 25 per cent, Wales's was 7.9 per cent and Northern Ireland's stood at 3.2 per cent.

Quarterly renewable electricity statistics by UK country can be found in the electronic version of table ET 6.1, at: www.gov.uk/government/statistics/energy-trends-section-6-renewables

Chart 6.8 Renewable electricity generation, by UK country



In 2016, renewable electricity generation in England was 55.6 TWh, an increase of 2.2 per cent (1.2 TWh) on 2015, with an extra 2.4 TWh of generation from solar PV (due to increased capacity) being partially offset by reduced generation from wind.

Generation in Scotland was 19.6 TWh, a fall of of 10 per cent (2.2 TWh); falls in generation from wind (1.4 TWh) and hydro (0.9 TWh), due to low wind speeds and rainfall, were only slightly offset by increases from solar PV and biomass (0.1 TWh each).

Generation in Wales was 5.3 TWh, an increase of 1.2 per cent (less than 0.1 TWh) on 2015, with increased generation from solar PV (0.2 TWh) more than half offset by reduced generation from wind.

In 2016, England accounted for 67 per cent of UK renewable electricity generation; Scotland's share was 24 per cent, Wales's was 6.4 per cent and Northern Ireland's stood at 2.8 per cent.

6 RENEWABLES

Table 6.1. Renewable electricity capacity and generation

	2015	2016 p	per cent change	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter	2016 2nd quarter	2016 3rd quarter	2016 4th quarter p
Cumulative Installed Capacity [1]												**MW**
Onshore Wind	9,188	10,602	*+15.4*	8,536	8,708	8,807	9,003	9,188	9,543r	9,719r	10,104r	10,602
Offshore Wind	5,104	5,094	*-0.2*	4,501	4,749	5,024	5,104	5,104	5,094	5,094	5,094	5,094
Shoreline wave / tidal	9	8	*-9.2*	9	9	9	9	9	8	8	8	8
Solar photovoltaics	9,188	11,562	*+25.8*	5,424	7,930	8,224	8,581	9,188	10,826r	11,238r	11,507r	11,562
Small scale Hydro	282	347	*+23.1*	252	261	267	272	282	307r	311r	343r	347
Large scale Hydro	1,477	1,477	-	1,477	1,477	1,477	1,477	1,477	1,477	1,477	1,477	1,477
Landfill gas	1,061	1,063	*+0.1*	1,058	1,061	1,061	1,061	1,061	1,062r	1,063r	1,063r	1,063
Sewage sludge digestion	216	245	*+13.5*	215	216	216	216	216	245	245	245	245
Energy from waste	925	929	*+0.4*	681	826	834	902	925	897r	897r	897r	929
Animal Biomass (non-AD) [2]	111	111	-	111	111	111	111	111	111	111	111	111
Anaerobic Digestion	286	374	*+30.7*	238	260	263	284	286	341r	347r	374r	374
Plant Biomass [3]	2,619	2,842	*+8.5*	2,245	2,297	2,298	2,976	2,619	2,781r	2,781r	2,790r	2,842
Total	30,465	34,654	*+13.7*	24,746	27,904	28,592	29,994	30,465	32,692r	33,291r	34,013r	34,654
Co-firing [4]	21	14	*-35.3*	15	21	21	21	21	14r	14r	14r	14
Generation [5]												**GWh**
Onshore Wind [6]	22,887	21,094	*-7.8*	6,002	7,182	4,775	3,825	7,106	6,334r	3,966r	4,623r	6,171
Offshore Wind [6, 7]	17,423	16,411	*-5.8*	4,686	4,676	3,578	3,412	5,757	5,150r	3,257r	3,584r	4,420
Shoreline wave / tidal [6]	2	-	*-100.0*	1	1	0	0	0	-	-	-	-
Solar photovoltaics [6]	7,561	10,292	*+36.1*	536	951	3,125	2,690	795	1,413r	3,808r	3,694r	1,377
Hydro [6]	6,289	5,368	*-14.6*	1,753	2,012	1,426	1,028	1,823	2,081r	935r	1,146r	1,206
Landfill gas [6]	4,872	4,617	*-5.2*	1,266	1,240	1,212	1,201	1,220	1,192r	1,149r	1,144r	1,132
Sewage sludge digestion [6]	888	953	*+7.4*	211	223	231	215	219	232r	249r	233r	239
Energy from waste [8]	2,782	2,559	*-8.0*	486	656	653	736	737	669r	578r	628r	683
Co-firing with fossil fuels	183	119	*-35.1*	34	36	36	57	55	51	15	5r	49
Animal Biomass (non-AD) [2, 6]	648	652	*+0.6*	162	170	171	142	165	170	164	141r	177
Anaerobic Digestion	1,429	1,874	*+31.2*	286	323	346	364	396	444r	461r	485r	485
Plant Biomass [3, 6]	18,587	18,817	*+1.2*	4,242	4,351	4,409	4,383	5,443	5,605r	5,005r	3,505r	4,702
Total	83,550	82,756	*-1.0*	19,665	21,819	19,961	18,053	23,717	23,340r	19,587r	19,189r	20,639
Non-biodegradable wastes [9]	2,784	2,560	*-8.0*	486	656	653	737	738	670r	578r	629r	684
Load Factors [10]												
Onshore Wind	29.5%	24.3%		32.4%	38.6%	25.0%	19.5%	35.4%	31.0%r	18.9%r	21.1%	27.0%
Offshore Wind	41.4%	36.6%		47.6%	46.8%	33.5%	30.5%	51.1%	46.3%r	29.3%r	31.9%	39.3%
Solar photovoltaics	11.8%	11.3%		4.7%	6.6%	17.7%	14.5%	4.1%	6.5%r	15.8%r	14.7%	5.4%
Hydro	41.2%	34.1%		46.0%	53.7%	37.5%	26.7%	47.1%	53.8%r	24.0%r	28.8%	30.0%
Landfill gas	52.5%	49.5%		54.3%	54.2%	52.3%	51.2%	52.1%	51.4%r	49.5%r	48.8%	48.2%
Sewage sludge digestion	46.9%	47.0%		44.7%	47.8%	48.9%	45.0%	45.8%	46.0%r	46.5%r	43.1%	44.1%
Energy from waste	39.6%	31.4%		33.6%	40.3%	36.0%	38.4%	36.5%	33.6%r	29.5%r	31.7%	33.9%
Animal Biomass (non-AD)	66.9%	67.1%		66.4%	71.1%	70.9%	58.1%	67.7%	70.4%r	67.9%r	57.6%	72.6%
Anaerobic Digestion	62.2%	64.6%		58.1%	59.9%	60.5%	60.3%	63.0%	64.7%r	61.3%r	60.9%	58.7%
Plant Biomass	87.2%	78.5%		86.0%	88.7%	87.9%	75.3%	88.1%	95.1%r	82.4%r	57.0%	75.6%
Total (excluding co-firing and non-biodegradable wastes)	34.5%	28.9%		36.7%	38.3%	32.3%	27.8%	35.5%	33.8%r	27.2%r	25.8%	27.2%

1. Cumulative capacity at the end of the quarter/year
2. Includes the use of poultry litter and meat and bone.
3. Includes the use of straw and energy crops. Also includes high-range co-firing (>85% biomass).
4. This is the amount of fossil fuelled capacity used for co-firing of renewables based on the proportion of generation accounted for by the renewable source over the course of the year.
5. Generation figures for the latest quarter are highly provisional, particularly for the thermal renewable technologies (such as landfill gas) in the lower half of the table.
6. Actual generation figures are given where available, but otherwise are estimated using a typical load factor or the design load factor, where known. Generation from FiT schemes is estimated this way.
7. For 2009, shoreline wave and tidal are included in offshore wind.
8. Biodegradable part only.
9. Non-biodegradable part of municipal solid waste plus waste tyres, hosptal waste and general industrial waste.
10. Load factors are calculated based on installed capacity at the beginning and the end of the quarter/year. These can be influenced by the time in the period when new capacity came online.
Load factors on an *unchanged configuration* basis, which consider just those sites operational throughout the year, are available annually in table DUKES 6.5, at:
www.gov.uk/government/publications/renewable-sources-of-energy-chapter-6-digest-of-united-kingdom-energy-statistics-dukes
11. Percentage change between the most recent quarter and the same quarter a year earlier; (+) represents a positive percentage change greater than 100%.

6 RENEWABLES

Table 6.2. Liquid biofuels for transport consumption [1]

	2015	2016 p	per cent change	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter	2016 2nd quarter	2016 3rd quarter	2016 4th quarter p	per cent change [2]
Volume (million litres)												**Million litres**	
Bioethanol	795	759	*-4.5*	202	189	203	205	198	184	194	189	192	*-3.0%*
Biodiesel	669	708	*+5.8*	229	125	152	177	215	143	219	196	150	*-30.2%*
Total biofuels for transport	1,464	1,467	*+0.2*	431	314	355	382	413	327	413	385	342	*-17.2%*
Energy (thousand toe)												**Thousand tonnes of oil equivalent**	
Bioethanol	448	428	*-4.5*	114	107	114	116	112	104	109	107	108	*-3.0%*
Biodiesel	550	582	*+5.8*	188	103	125	145	177	117	180	161	123	*-30.2%*
Total biofuels for transport	998	1,010	*+1.2*	302	209	239	261	288	221	289	268	231	*-19.7%*
Shares of road fuels (by volume)													
Bioethanol as per cent of Motor Spirit	4.6%	4.4%		4.6%	4.6%	4.6%	4.7%	4.5%	4.5%	4.4%	4.4%	4.5%	
Biodiesel as per cent of DERV	2.3%	2.4%		3.1%	1.8%	2.1%	2.4%	2.9%	2.0%	2.9%	2.6%	1.9%	
Total biofuels as per cent of road fuels	3.2%	3.1%		3.7%	2.9%	3.0%	3.3%	3.5%	2.9%	3.4%	3.2%	2.8%	

1. These figures differ from those presented in table 3.5, since the latter add/subtract changes in stock levels to these figures, to represent actual consumption of biofuels in the peric

2. Percentage change between the most recent quarter and the same quarter a year earlier.

Source: HM Revenue and Customs Hydrocarbon Oils Bulletin, available at

www.uktradeinfo.com/Statistics/Pages/TaxAndDutybulletins.aspx

Shares of road fuels - % change on quarter in previous year	**% change on quarter in previous year (-ve value is decrease)**							
Bioethanol as per cent of Motor Spirit	0.1%	0.1%	0.1%	-0.1%	0.0%	-0.1%	-0.2%	-0.3%	-0.1%
Biodiesel as per cent of DERV	-0.1%	-1.1%	-1.6%	-1.4%	-0.3%	0.2%	0.8%	0.2%	-0.9%
Total biofuels as per cent of road fuels	0.0%	-0.7%	-1.0%	-0.9%	-0.2%	0.0%	0.4%	0.0%	-0.7%

Domestic energy bills in 2016: The impact of variable consumption

Summary

Actual annual gas and standard electricity bills have fallen from 2015 to 2016, by 5.5 and 0.6 per cent respectively. This is primarily due to decreases in gas prices in 2015 and 2016, and decreases in consumption of electricity. Combined annual actual bills are at their lowest since 2011 at £1,134. When controlling for seasonal variation the long term trend of decreasing energy consumption has continued, though actual gas consumption in 2016 did increase on the previous year due to colder average temperatures.

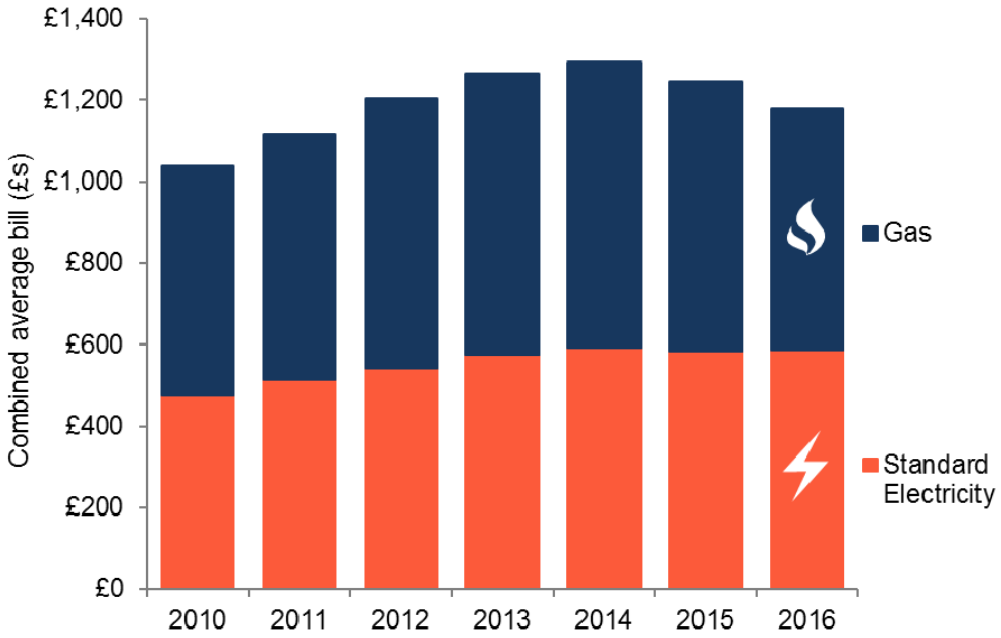
Drivers of actual bills

The two key drivers of actual bills are the unit prices of energy and the amount of energy consumed. There are several further factors that influence consumption, such as increased energy efficiency though household insulation or more efficient appliances, but the most influential factor of gas consumption is the weather.

Drivers of actual bills - price changes

Annual energy bills can be calculated based on fixed energy consumption levels: a given consumption level of energy that does not change from year to year[1]. This allows price comparisons between years as the impacts of weather and energy efficiency measures on bills that influence consumption are removed. Average combined bills between 2010 and 2016 are shown in Chart 1.

Chart 1: Domestic energy bills based on fixed consumption levels 2010-2016[2]



[1] BEIS publishes estimates of annual domestic electricity and gas bills in its Quarterly Energy Prices (QEP) publication. These bills are based on quarterly pricing information collected from energy suppliers. They are calculated using standard annual consumption assumptions of 3,800kWh for standard electricity, 6,000kWh for Economy 7 electricity (3000kWh day units and 3000kWh night units), and 15,000kWh for gas.

[2] Gas data within this article refers to Great Britain unless otherwise stated. Electricity bills and consumption figures are based on UK data.

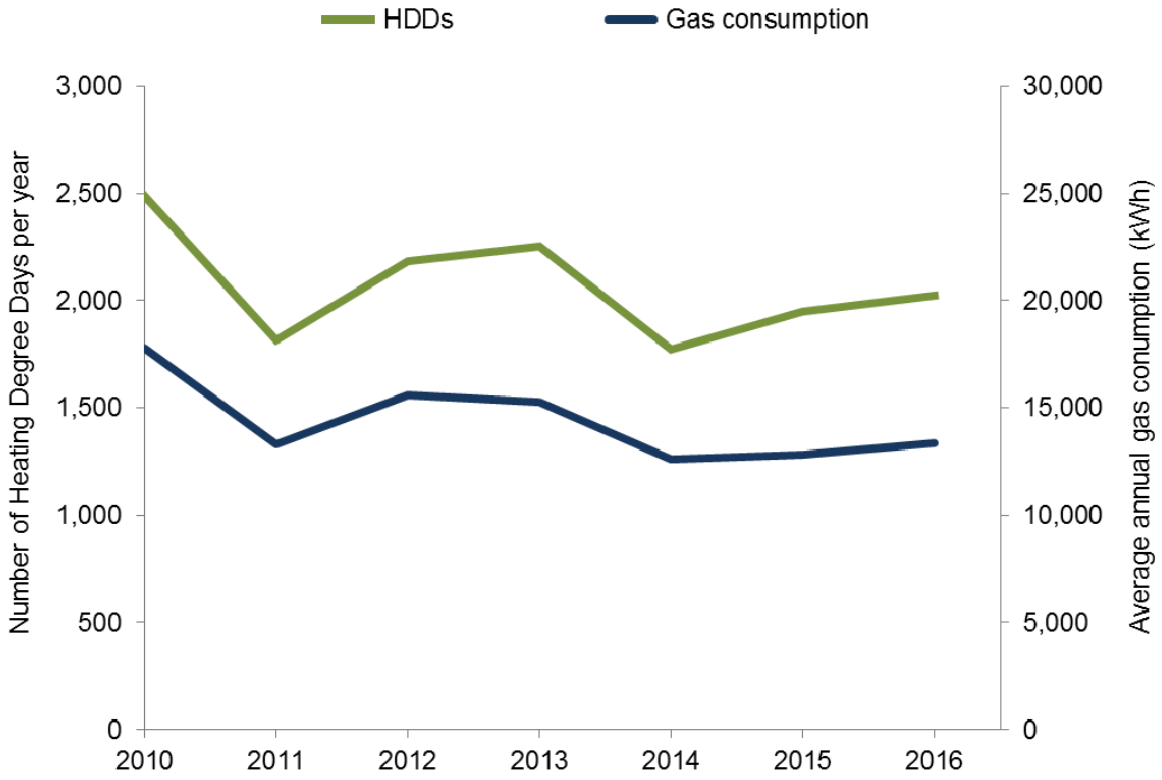
From 2010 to 2014 combined bills based on fixed consumption levels have increased, gas bills rising at a quicker rate than standard electricity bills. Since 2014 they have begun to fall again; a £12 rebate applied to Great British electricity bills in 2014 and 2015 helped to prevent further increases in electricity bills, while gas price cuts by the big six domestic energy suppliers in 2015 and 2016 reduced gas bills.

Drivers of actual bills – consumption

Weather conditions are a key factor affecting the amount of energy consumed, as people will consume more energy during a colder year to heat their homes. Variation in consumption is far greater for gas than electricity as a result of variation in the demand for heating. BEIS estimates that in 2015, 84 per cent of domestic gas use was for space heating, compared to only 23 per cent for electricity.[3] As a result, the degree to which changes in electricity consumption will be attributable to weather patterns will be much smaller than for gas, as far fewer households use electricity for heating compared to other purposes.

Heating Degree Days (HDDs) can be used to assess average temperatures over time, as a measure of the heating needed to raise a building's temperature to a given level[4]. As Chart 2 shows, HDDs and gas consumption follow very similar trends, as people consume gas to heat their homes proportionally to the heat needed to achieve the given temperature.

Chart 2: Heating Degree Days 2006-2016

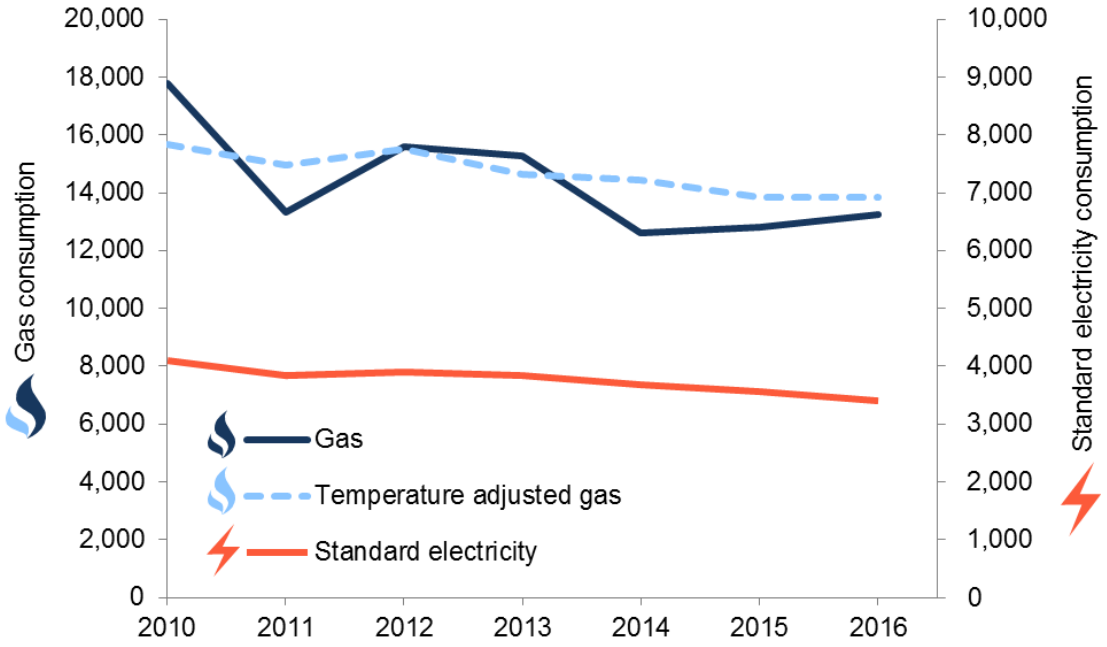


[3] Energy Consumption in the UK: Table 3.02

[4] HDDs are calculated relative to a base temperature (BEIS uses 15.5°C), so if a day has an average (of the maximum and minimum) temperature of 10°C, the HDD for that day will be 5.5. If the daily average temperature exceeds the base temperature, the HDD for that day will be 0. The HDDs are summed for each month and published in Table 7.1 of Energy Trends.

Although consumption does vary from year to year, the long term trend is of declining energy use. This is likely to be as a result of a number of factors, which include weather patterns and increased household energy efficiency in the form of both greater insulation and increased efficiency of boilers, lighting and appliances. This is more apparent when adjusting gas consumption to remove changes in consumption attributable to fluctuating temperatures, as shown in Chart 3.

Chart 3: Average annual domestic energy consumption in the UK: 2010-2016 (kWh)[5]



The average consumption of standard electricity has slightly decreased from 2015, whereas average electricity consumption for E7 consumers has slightly risen. Consumers with E7 meters typically heat their homes through electricity rather than gas, so the consumption has therefore increased, similarly with gas, due to the colder weather and a greater demand for heating in 2016.

Table 1: Average annual household consumption in kWh 2011-2016[6]

	Standard electricity	E7 electricity	Total electricity	Gas
2010	4,098	6,226	4,423	17,783
2011	3,841	5,843	4,134	13,307
2012	3,905	6,089	4,216	15,577
2013	3,849	5,943	4,077	15,280
2014	3,670	5,585	3,933	12,609
2015	3,556	5,961	3,867	12,817
2016	3,509	5,990	3,830	13,351
Change 2015 - 2016	-1.3%	0.5%	-1.0%	4.2%

[5] Electricity consumption figures include both Standard Electricity and Economy 7 Electricity customers.
[6] Total domestic consumption figures are available in DUKES tables 4.2 (Gas) and 5.3 (Electricity). Average domestic consumption is calculated by dividing total domestic consumption by BEIS' estimates of customer numbers on each fuel type: 24 million domestic Standard electricity customers and 3.6 million Economy 7 electricity customers in the UK, and 23 million domestic Gas customers in Great Britain. These figures are based on data collected through the Domestic Fuel Inquiry.

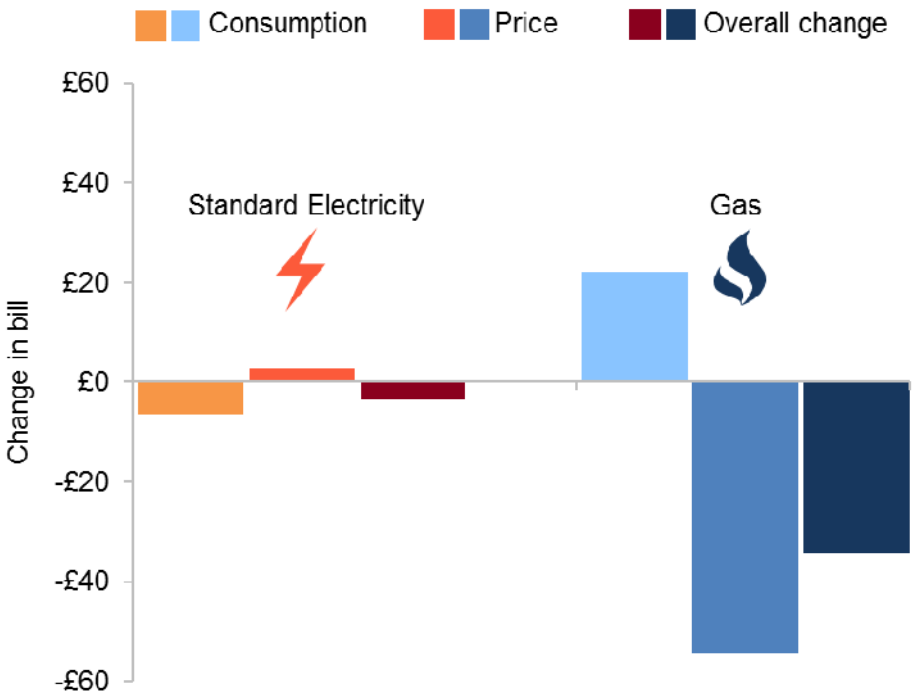
Annual domestic energy bills based on actual consumption

The extent to which price and consumption changes cause overall bill changes can be analysed by holding one driver constant so any change in the bill is attributable to the other.

If standard electricity prices had remained static from 2015 to 2016 bills would have decreased by £6 due to the fall in consumption. If consumption had remained static bills would have increased by £3 due to the increase in price. The combination of these factors caused average standard electricity bills to decrease by £3.

Converseley for gas, if prices had remained static from 2015 to 2016 bills would have increased by £22 due to increased consumption due to the colder temperatures in 2016. Whereas if consumption had remained static bills would have decreased by £54 due to the decrease in prices. Together, these factors resulted in a decrease of £34 for the average actual gas bill. This is demonstrated in Chart 5 below.

Chart 4: 2015 to 2016 changes in energy bills attributable to changes in consumption and price



Due to these falls in standard electricity and gas bills, actual combined bills in 2016 are the lowest they have been since 2011 at £1,134, a decrease of 3.2 per cent on the previous year. Actual gas bills decreased by 5.5 per cent and standard electricity bills by 0.6 per cent.

Chart 5 shows actual annual bills over time in the same format Chart 1 shows bills at fixed consumption levels over time. Differences between the two can largely be attributed to the impact of variable consumption.

Chart 5: 2010 to 2016 average actual annual bills

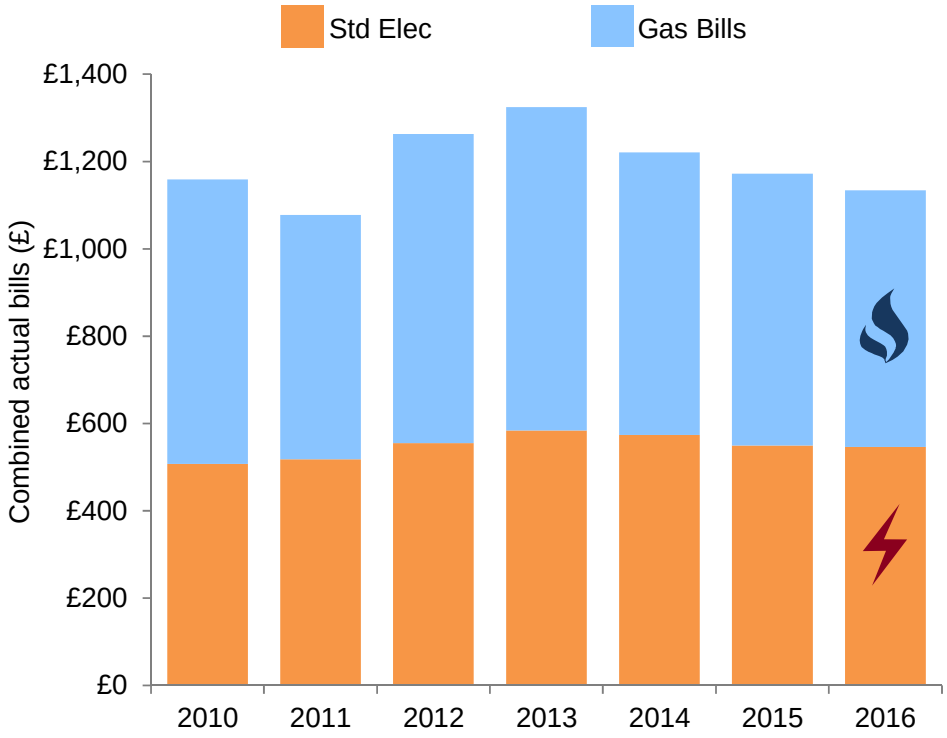


Table 2: Average energy bills on actual consumption

	Standard Electricity	Gas	Total
2010	£508	£652	£1,159
2011	£518	£559	£1,077
2012	£555	£708	£1,263
2013	£584	£740	£1,324
2014	£574	£647	£1,221
2015	£549	£622	£1,172
2016	£546	£588	£1,134
Change 2015 - 2016	-£3	-£34	-£38
% Change	-0.6%	-5.5%	-3.2%

In summary, actual annual energy bills are at their lowest since 2011, at £1,134. This is largely due to gas price decreases in 2015 and 2016 which have outweighed the temperature related increases in gas consumption over the same period. Electricity prices have remained relatively static in recent years, whilst the long term trend of decreasing electricity consumption has led to reduced electricity bills.

User feedback

Please send any comments or queries regarding this analysis to the contact details below:

Liz Vincent
Energy Prices Statistics
Tel: 0300 068 5162
E-mail: Elizabeth.Vincent@beis.gov.uk

Reuben Pullan
Energy Prices Statistics
Tel: 0300 068 5057
E-mail: Reuben.Pullan@beis.gov.uk

UKCS Capital Expenditure Survey 2017

Introduction

A survey of activity relating to oil and gas fields on the UK Continental Shelf (UKCS) and associated infrastructure was conducted in January 2017. The UKCS Stewardship Survey was undertaken by the Oil and Gas Authority (OGA) in succession to the Activity Survey which had been conducted annually by Oil & Gas UK. As with the Activity Survey, the UKCS Stewardship Survey covered operators' intentions to invest in UKCS oil and gas production. It also collected information on outturn and projected operating and decommissioning costs, exploration and appraisal activity and oil and gas production. This note is restricted to development capital expenditure in the period up to 2021.

Summary of results

The survey indicates total development capital expenditure (i.e. excluding expenditure on exploration, appraisal and decommissioning) relating to fields, pipelines and terminals of some £8.4 billion in 2016, significantly lower than the OGA's central estimate of £10 billion published in March 2016. The survey also indicates outturn development capital expenditure of £11.3 billion in 2015, slightly down on the previous estimate of £11.6 billion which was based on the Activity Survey run in late 2015.

Operators' expectations of future capital expenditure, summarised in Table 1 and Chart 1 below, suggest that expenditure will fall in 2017 and subsequent years. Much uncertainty applies to such projections but the OGA's central estimates are for spend of £7 billion in 2017, £6 billion in 2018 and £5 billion in 2019 (all in 2016 prices).

Capital expenditure plans by category

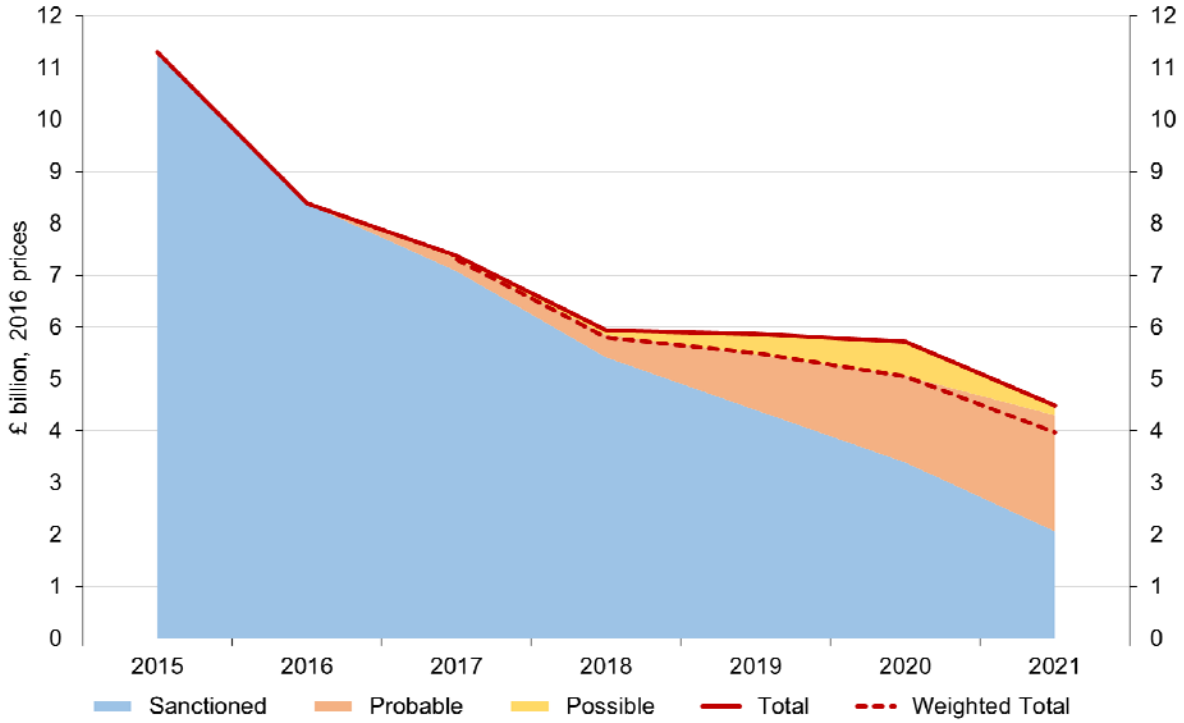
Operators were asked to report their investment intentions for all oil and gas field developments and projects where development data were available. Each field or project that was not already sanctioned was assigned a probability of proceeding. Sanctioned projects had a probability of 100 per cent of proceeding; probable projects has probabilities of 50 per cent or more but less than 100 per cent; and possible projects had a probability of less than 50 per cent. Expenditure has been included on the scale and at the time reported by the operators though it is likely that at least some of the less-certain projects will slip or even not materialise. The table also includes weighted totals which reflect the probabilities assigned by the operators; the resultant profile for total development capital expenditure is very close to that for sanctioned fields plus probable projects.

Table 1: Total UKCS development capital expenditure plans by category

(£ billion, 2016 prices)	Sanctioned	Probable	Sanctioned plus Probable	Possible	Total	Weighted Total
2017	7.1	0.2	7.3	0.0	7.4	7.3
2018	5.4	0.4	5.9	0.1	5.9	5.8
2019	4.4	1.1	5.5	0.4	5.9	5.5
2020	3.4	1.7	5.1	0.7	5.7	5.0
2021	2.1	2.2	4.3	0.2	4.5	4.0
Total for 2017–2021	**22.4**	**5.7**	**28.0**	**1.4**	**29.4**	**27.6**

The survey indicates low levels of as-yet-unsanctioned development capital expenditure, especially in the next three years. It is extremely unlikely that all of the (limited) spend on possible projects will go ahead as reported, at least on the timeframe indicated, but against that the survey excludes activity relating to new and some recent discoveries and extends beyond the time horizon for planning many incremental projects.

Chart 1: Total UKCS development capital expenditure plans by category



Compared with the Activity Survey conducted in late 2015, the latest survey indicates operators' intentions over the next years are for lower development capital expenditure but with a higher share of sanctioned spend and lower shares for both probable and possible spend.

Mike Earp
Oil and Gas Authority
Tel: 0300 067 1604
E-mail: mike.earp@ogauthority.co.uk

Mapping the UK's oil stocks

Introduction

To meet its international obligations, the UK holds oil stocks to lessen the impact of global disruptions to oil supply. These are over and above those volumes held for commercial purposes. This article outlines where stocks are located in the UK, and elsewhere in Europe.

Background to oil stocking

The UK is required to hold oil stocks to meet obligations imposed by both the International Energy Agency (IEA) and the European Union (EU). For the IEA obligation, (www.iea.org/topics/oil/oilstocks/methodology/), the UK must hold 90 days of net oil imports. The EU obligation requires countries to hold the higher of 90 days of net oil imports or 61 days of oil consumption. As the UK is still a significant producer of crude oil, it is currently bound by the requirement to hold 61 days of consumption, as this currently represents the greater volume. The EU methodology is outlined at:
http://eur-lex.europa.eu/legal-content/EN/ALL/?qid=1414672111051&uri=CELEX:32009L0119

The purpose of these stocks is to help buttress the global oil market by ensuring that stock can be released to minimise volumes lost to the global market from any disruption. To date, there have been three releases co-ordinated by the IEA, responding to the disruption of the 1991 Gulf War, the damage from Hurricanes Katrina and Rita in 2005, and the contraction of oil supply from Libya in 2011. In the event of a disruption, stock is made available to the global market.

The UK manages its oil stocking obligations by issuing legally-binding directions to substantial suppliers[1] of oil based on their UK market share. The obligations currently bear on refiners and the larger importers and stipulate what products and volumes are required, and the reporting arrangements for those oils. While BEIS reports monthly figures on oil stocks in table ET 3.11 (www.gov.uk/government/statistics/oil-and-oil-products-section-3-energy-trends) information on stock locations has not previously been published.

How companies hold oil stocks

Companies hold stock to meet their obligation in one of three ways:

- Firstly, they hold stock at their own refineries or terminals, or in storage locations owned by third parties. Map 1 charts where these stocks are held in the UK. These volumes will also include the operator's commercial stock (stock holding in excess of the obligated amount). These volumes vary but typically are in the region of 2 million tonnes.

- Secondly, companies can reserve volumes of stock owned by other companies. These are commercial arrangements between companies (monitored by BEIS) that help facilitate the efficient functioning of the oil stocking obligation. These volumes are included within Map 1.

- Thirdly, companies can hold stock elsewhere in the EU, under bilateral agreements between the companies involved and the respective member states. These agreements must be authorised by both BEIS and the other member state in advance. The application must include the company or organisation holding the stock and the product, quantity and the location of the stock. All stocks held in this way are counted towards a company's obligation and must be available to be released in case of an emergency.

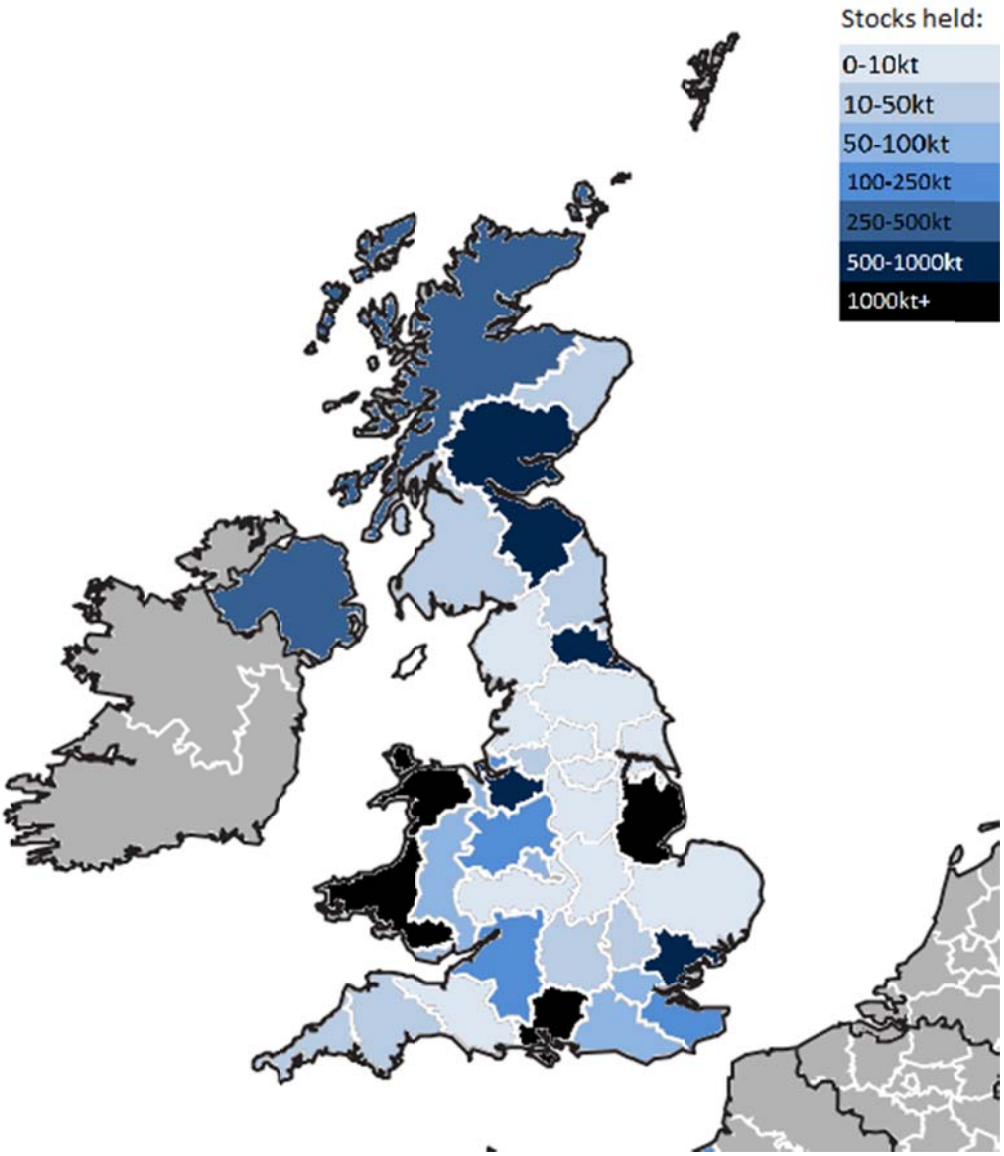
[1] A "substantial supplier" is defined as a company whose supply of oil to the UK market exceeded 50,000 tonnes of crude liquid petroleum or petroleum products during a 12 month period.

As a result, substantial volumes of stock are held outside of the UK's border. In total on the 31st December 2016, around 9.5 million tonnes of stock (7.1 MT obligated and 2.4 MT commercial) are held in the UK, and around 5 million tonnes held elsewhere in Europe. In total, these stocks are able to broadly meet our obligations. For reference, the amount of stock released during the Libyan disruption was equivalent under 3 days of the 61 days available.

Oil stock locations in the UK

The map below illustrates the location of all oil stocks held in the UK at the 31st December 2016. Annex 1 shows the underlying data.

Map 1: Location of stocks within the United Kingdom



The map indicates that the majority of oil stored in the UK is stored in coastal areas that have the requisite infastructure – the ports, terminals and refineries – to faciliate both trade and storage. Just under half of all the oil stored in the UK was located in Hampshire, Lincolnshire and West

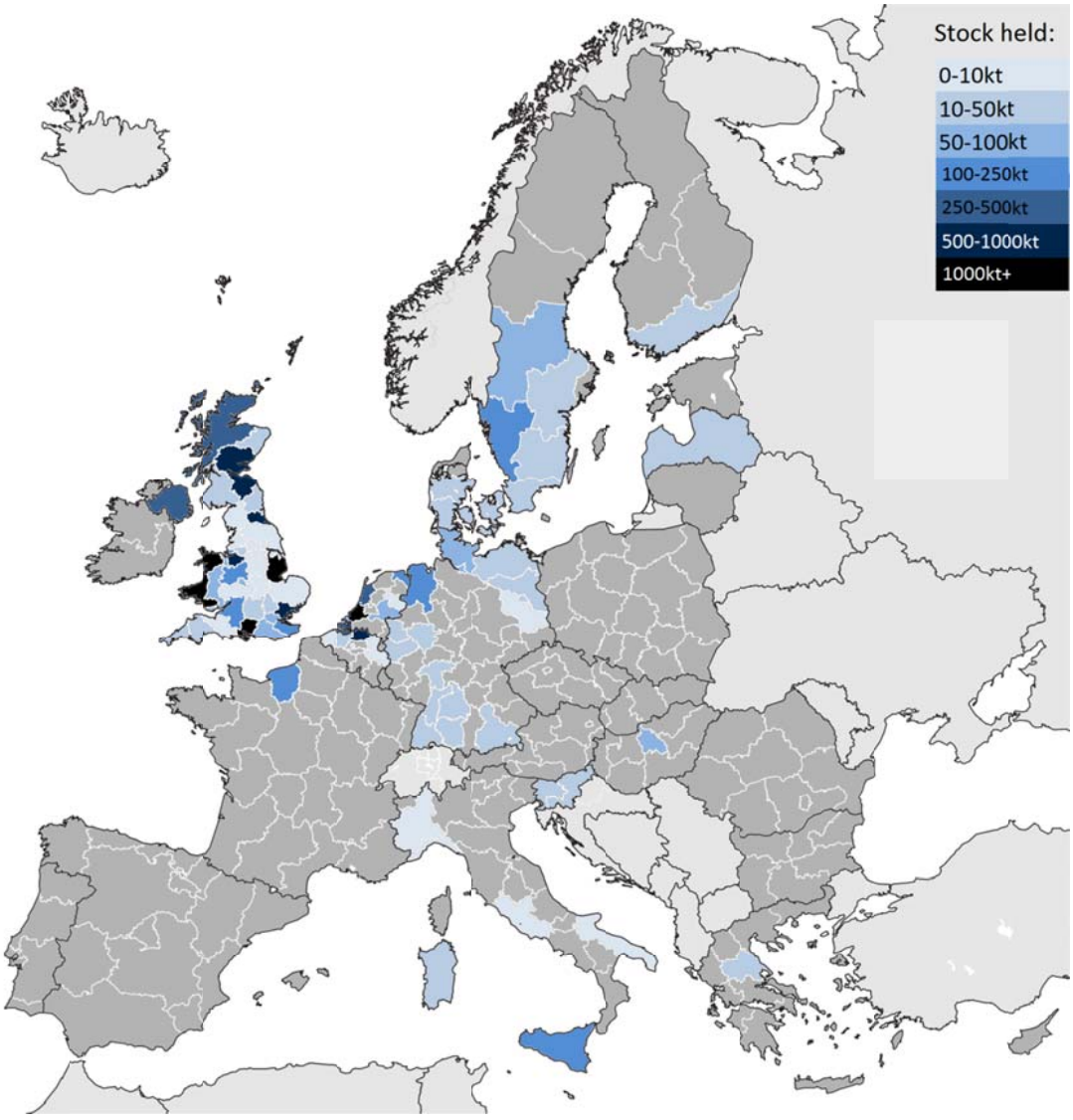
Wales. There are a further four areas that also held significant volumes. These top seven areas for oil storage account for around 80% of all the UK stocks.

Whilst inland areas tend to hold less stock, there is an extensive pipeline network for the distribution of oil throughout the UK, along with deliveries by truck where necessary.

Stocks held in other EU member states on behalf of the UK

The map below shows the location of stocks helf in other EU member states on behalf of the UK on the 31st December 2016. Annex 2 shows the underlying data.

Map 2: Location of stocks in the United Kingdom and in the EU



The bulk of oil held in other European member states is held in the Netherlands and Belgium. Stock in the Netherlands accounts for around half of all stock held abroad, with a further 17 per cent held in Belgium. The bulk of this oil is held in the Amsterdam-Rotterdam-Antwerp (ARA) oil hub.

The remaining stock is distributed throughout Europe, with significant volumes in Germany, Sweden and Italy.

The principal requirement for the UK's emergency oil stocks are that they are accessible to the market in the event of a global disruption, rather than that they are held within the UK. Much of the oil held in other member states is easily accessible to the UK with stocks in the ARA area (over two thirds of the stock held abroad) being held only short sailing distances away, with the possibility of resupply to the UK (loading, sailing and unloading) of only a few days.

Summary

Since 1995, the net amount of stock held outside of the UK has increased from around 10 per cent of the total to just over a quarter of the total, see Energy Trends table 3.11 at: www.gov.uk/government/statistics/oil-and-oil-products-section-3-energy-trends, due in part to companies taking advantage of a widening group of international partners willing to hold stocks, and increased flexibility offered to member states as part of the EU's oil stocking directive.

BEIS continue to monitor oil stocking locations on a monthly basis to ensure the commercial efficiencies offered by international stocking are balanced against the volumes domestically that could help us to respond to short-term domestic emergencies, which fall short of needing a European or worldwide co-ordinated response.

James Halliwell
Oil and Gas Statistics Team
Tel: 0300 068 8121
E-mail: James.Halliwell@beis.gov.uk

Annex 1: UK Oil Stocks 31st December 2016

Location of stocks by NUTS 2 regions. The data have been catergorised to avoid any commercially sensitive information being disclosed.

Area	Kilotonnes
Bedfordshire and Hertfordshire	10-50
Berkshire, Buckinghamshire, and Oxfordshire	10-50
Cheshire	500-1000
Cornwall and Isles of Scilly	10-50
Cumbria	0-10
Derbyshire and Nottinghamshire	0-10
Devon	10-50
Dorset and Somerset	0-10
East Anglia	0-10
East Riding and North Lincolnshire	0-10
East Wales	50-100
Eastern Scotland	500-1000
Essex	500-1000
Gloucestershire, Wiltshire and the Bristol/Bath area	100-250
Greater Manchester	10-50
Hampshire and Isle of Wight	1000+
Herefordshire, Worcestershire and Warwickshire	0-10
Highlands and Islands	250-500
Kent	100-250
Lancashire	0-10
Leicestershire, Rutland and Northamptonshire	0-10
Lincolnshire	1000+
London	50-100
Merseyside	100-250
North Eastern Scotland	10-50
North Yorkshire	0-10
Northern Ireland	250-500
Northumberland and Tyne and Wear	10-50
Shropshire and Staffordshire	100-250
South Western Scotland	10-50
South Yorkshire	0-10
Surrey, East and West Sussex	50-100
Tees Valley and Durham	500-1000
West Midlands	10-50
West Wales and The Valleys	1000+
West Yorkshire	0-10
In transit	250-500
Total Stock[1]	9500
-of which commercial[1]	2400

[1] Figures rounded to the nearest 100

Annex 2: Location of stocks held in other EU member states on behalf of the UK 31st December 2016.

Figures have been rounded to the nearest 10.

Country	Kilotonnes
Belgium	820
Denmark	100
Estonia	20
Finland	30
France	100
Germany	580
Greece	20
Hungary	60
Italy	210
Malta	60
Netherlands	2390
Slovenia	30
Sweden	360
Grand Total	4770

International comparisons of energy efficiency indicators

Introduction

A helpful way to measure the performance of UK energy efficiency is to compare its energy intensity in different sectors the economy relative to other countries. This article presents indicators for each of the main energy consuming sectors based on data published by the ODYSSEE European energy efficiency indicators project[1]. These indicators are designed to make meaningful comparisons between countries; however care must be taken when making comparisons regarding efficiency due to differences in the types of energy uses in different countries, and differences in heating demand, building type and the structure of industry that cannot be fully controlled for.

Data in this article are taken from the ODYSSEE database unless otherwise noted. The ODYSSEE project is a European Commission supported project made up of partners from EU Member States together with Norway to produce detailed energy efficiency indicators for European countries. The majority of countries have data covering at least 2000 to 2014. However, in some cases where a country does not have 2014 data available yet the most recent data available has been used. This will is noted as a footnote where applicable. If a country is not displayed on a cross-European chart, it is because that country has not reported data for that indicator at the time of writing.

It is useful to make comparisons to countries that are similar to the UK both in climate and economic factors for example France & Germany. It is noticeable in a number of the indicators shown that the EU members prior to 2004 (EU15), which includes the UK, often show a different level when compared to more recent members. Therefore, throughout the charts in this article EU15 countries will be presented with an amber border.

This article provides a brief overview of energy efficiency in each major sector. All energy figures are presented in net calorific values (NCV)[2], and so are not directly comparable with other data in Energy Trends and the Digest of UK Energy Statistics.

Domestic

The indicator in Chart 1 shows average energy consumption per dwelling, adjusted for climatic differences across the EU. This indicator uses climate corrected data, which enables better comparisons to be made across countries by adjusting some key energy uses (e.g. heating demand) based on modelled variation both over time and to standard EU climate; for instance a household that lives in a country with a cooler climate may use more energy to heat their home than a household living in a warm climate.

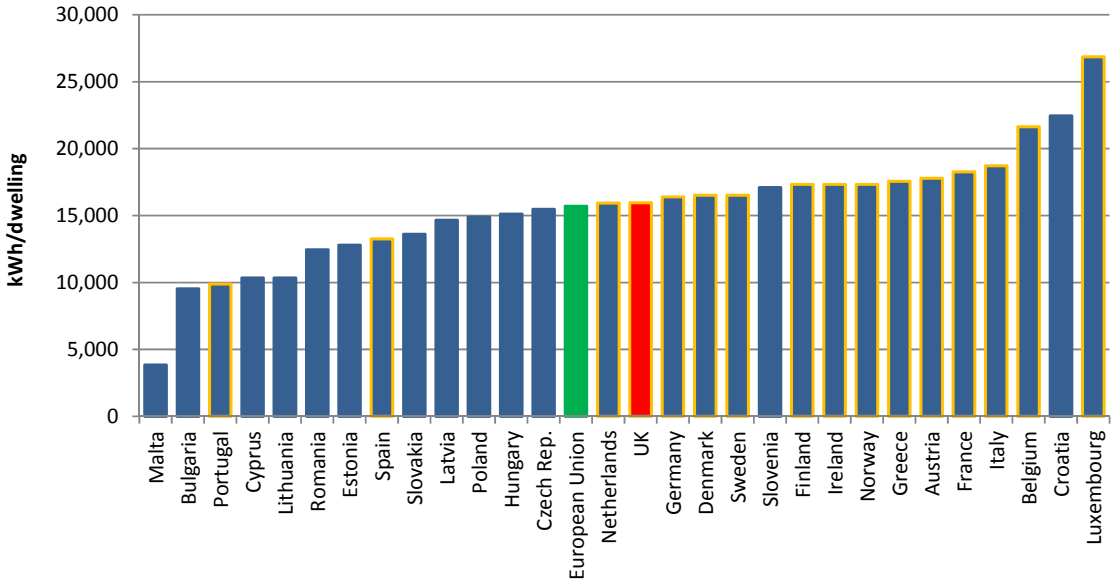
In 2014, UK average consumption per dwelling when adjusted to the EU climate[3] was 16,000 kWh per dwelling, 2 per cent higher than the EU average of 15,700 kWh per dwelling. In 2014, UK average consumption per dwelling was 5 per cent less than Germany and 13 per cent less than France after climate adjustment. Despite the climate adjustment the lowest consumers appear to favour southern European countries and non EU15 countries.

[1] www.odyssee-mure.eu/

[2] www.gov.uk/government/statistics/dukes-calorific-values

[3] Temperature correction of a country's energy consumption data adjusted for difference in temperature compared to the average EU climate.

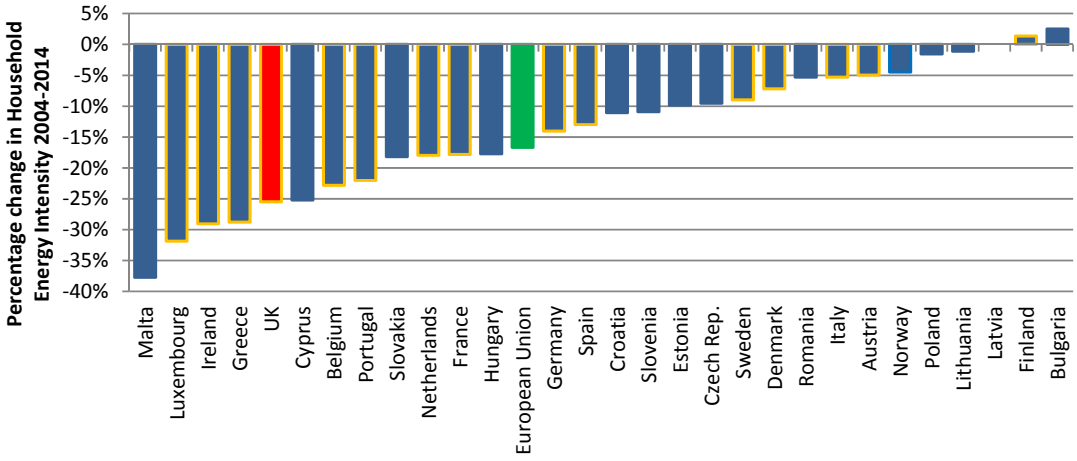
Chart 1: Domestic energy consumption per dwelling adjusted to the EU climate, 2014[4]



Source: ODYSSEE

Overall, UK energy consumption per dwelling after climate correction saw the fifth largest fall of 25 per cent between 2004 and 2014. By comparison, the EU average fell by 17 per cent over the same period, with energy consumption per dwelling falling in all EU countries except Bulgaria, Finland.

Chart 2: Change in domestic energy consumption per dwelling adjusted to the EU climate from 2004 to 2014[6]



Source: ODYSSEE

[4] Note: Data for Romania are from 2001-11, Malta from 2002-12 and Portugal from 2003-13.

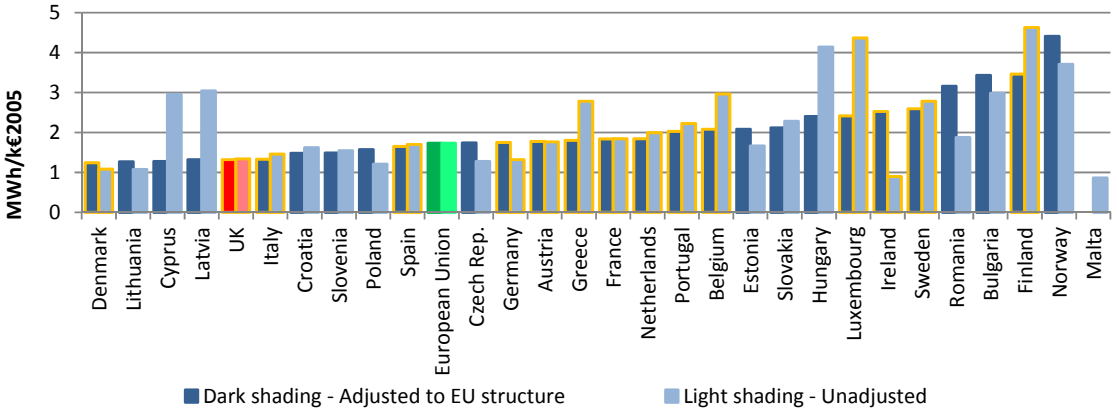
Manufacturing

Manufacturing intensity can either be measured relative to the gross value added (GVA) to the gross domestic product of the sector or to the amount of production.

The UK has the eighth lowest raw overall manufacturing intensity relative to GVA in Europe, 23 per cent below the EU average.[5,6]

A key issue in determining the energy intensity of manufacturing is the share of each manufacturing sub-sector within the industry of each country. In 2014, UK energy intensity was 1 per cent lower once adjusted to the EU standard share of each sub-sector, reflecting that the structure of UK manufacturing is slightly more energy intensive than the EU average. After adjusting for EU structure, the UK has the fifth lowest manufacturing energy intensity in Europe, 24 per cent below the EU average, 25 per cent less than Germany and 28 per cent less than France relative to gross value added.[5,6]

Chart 3: Manufacturing energy consumption per unit of GVA 2014 for unadjusted data and adjusted to EU structure (PPP adjusted).[7]



Source: ODYSSEE

Since 2004, UK manufacturing energy intensity has fallen by 23 per cent. When data are adjusted for EU structure, UK manufacturing intensity fell by 29 per cent. The EU as a whole has reduced its manufacturing energy intensity by 24 per cent in the same period, which is 5 percentage points worse than the UK after adjustments. Between 2004 and 2014, the GVA of the UK's manufacturing industry fell by 3 per cent[8], and in 2014 manufacturing only accounted for 10 per cent of the UK's GVA.[9]

[5] Purchasing power parity (PPP) is an alternative to using market exchange rates. The purchasing power of a currency refers to the quantity of the currency needed to purchase a given unit of a good, or common basket of goods and services.

[6] Data for manufacturing intensity at the EU structure has not been reported for Malta. Manufacturing intensity data adjusted at EU structure is calculated by taking actual sub-sectoral intensities of the country and the share of each branch in the value added of manufacturing of the EU. Data for Romania are for 2011, Malta, Luxembourg and Hungary for 2012 and Portugal for 2013.

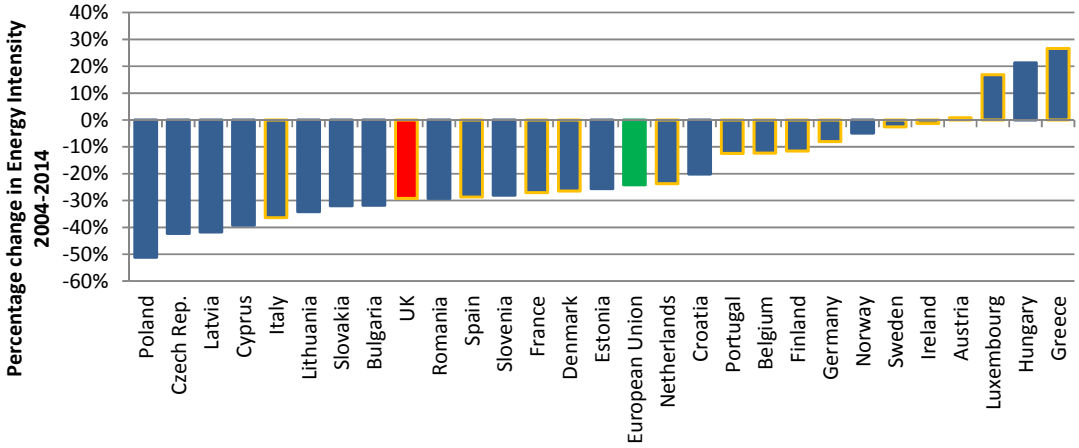
[7] Countries ordered by increasing EU structure adjusted intensity (dark blue).

[8] www.ons.gov.uk/file?uri=/economy/grossdomesticproductgdp/datasets/ukquarterlynationalaccountsdatatables/current/ukquarterlynationalaccountsdatatablesq32016.xls

[9] www.ons.gov.uk/economy/grossvalueaddedgva/datasets/regionalgrossvalueaddedincomeapproach

When the energy intensity of industry has been adjusted for EU structure the UK has made the ninth largest reduction in the EU, and the second largest reduction in manufacturing energy intensity out of countries in the EU 15 (Chart 4).

Chart 4: Change in manufacturing energy consumption per unit of GVA, 2004-2014 (PPP adjusted at EU structure).[10]



Source: ODYSSEE

While it is important to compare the broad indicator of manufacturing intensity, it is also interesting to compare relative efficiencies of manufacturing sub-sectors across countries. Care should be taken whilst making international comparisons of manufacturing because the type and quality of products produced varies between countries. For example in the steel industry, energy intensity will vary depending on the share of coke that is manufactured on-site compared to the share that is purchased.

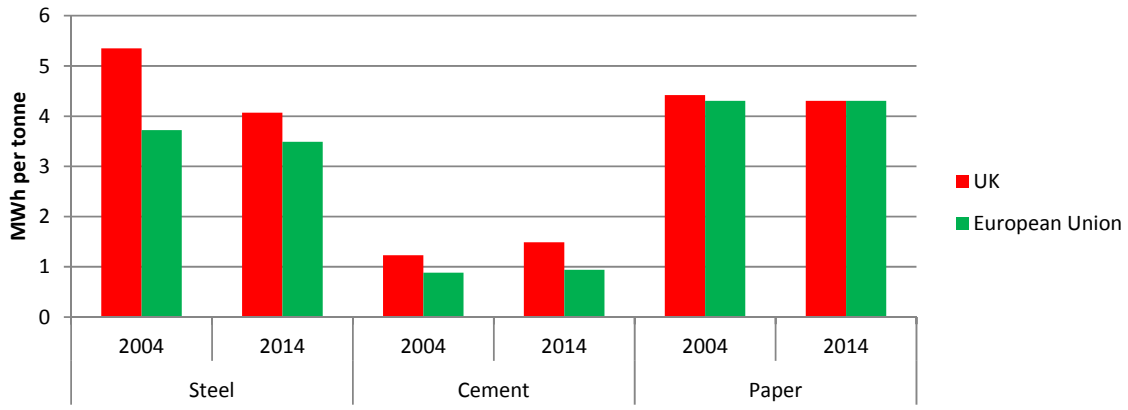
Energy intensity in the cement, steel and paper sectors are measured by energy consumption by physical output (tonnes). Using this measure for these energy intensive sectors the UK is generally shown to be more energy intensive than the EU as a whole.

In 2014, the UK was 58 per cent more energy intensive than the EU in cement and by 17 per cent in steel. There was no difference in the energy intensity of paper manufacturing between the UK and EU average. Between 2004 and 2014 the UK's energy intensity in cement increased by 21 per cent with an increase of 7 per cent across the EU as a whole. The UK's energy intensity in steel decreased by 24 per cent over the same time period and for paper manufacturing decreased by 3 per cent.

UK output of the cement sector fell 23 per cent between 2004 and 2014, whilst the paper sector fell 29 per cent and the steel sector rose 5 per cent over the same time period.

[10] Note: Manufacturing intensity data adjusted at EU structure is calculated by taking actual sub-sectoral intensities of the country and the share of each branch in the value added of manufacturing of the EU. Data for Romania are for 2011, Malta, Luxembourg and Hungary for 2012 and Portugal for 2013.

Chart 5: Energy intensity by manufacturing sector, UK and EU, 2004 and 2014



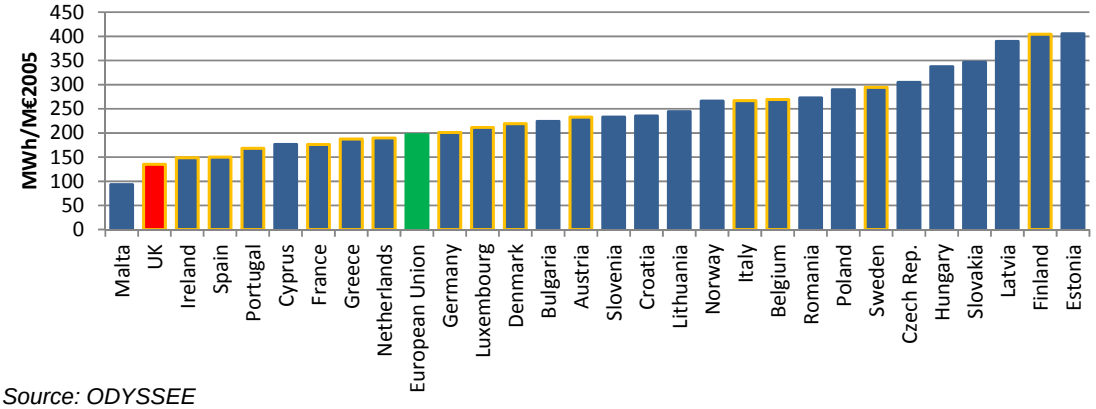
Source: ODYSSEE

Commercial and Public Sector Services

The UK has the second least energy intensive service sector in the EU as measured by energy consumption per unit of GVA, shown in Chart 6. The UK performs particularly well on this indicator due to the high-value professional services that generate high GVA for relatively low energy use. UK service sector energy consumption per unit of GVA on a climate and PPP adjusted basis was 31 per cent lower than the EU average, 23 per cent lower than France and 33 per cent lower than Germany in 2014. The UK service sector is the dominant sector of the UK economy, contributing 80 per cent of GDP output in 2014.[11]

Between 2004 and 2014, the UK's service sector energy consumption remained stable, but with an increase in GVA, intensity fell by 22 per cent compared to a fall of 9 per cent in the EU as a whole.

Chart 6: Service Sector energy consumption per unit of GVA, 2014 (Climate and PPP adjusted)[12]



Source: ODYSSEE

[11] www.ons.gov.uk/economy/grossvalueaddedgva/datasets/regionalgrossvalueaddedincomeapproach

[12] Note: Data for Romania are for 2011, Malta are 2012 and Sweden are 2013.

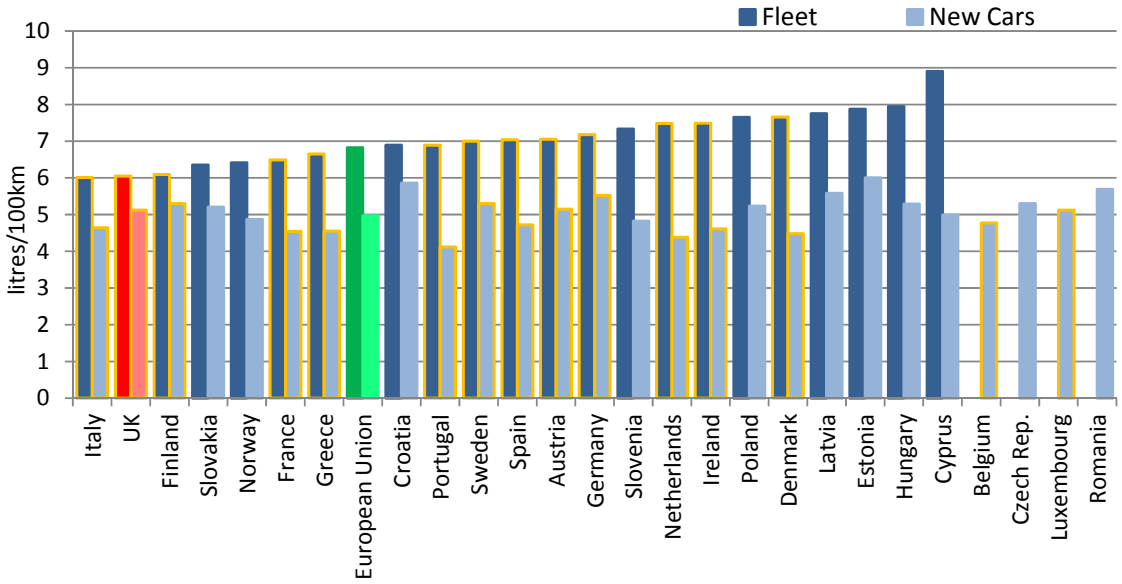
Transport

The energy efficiency of vehicles is measured by the amount of fuel needed to cover 100km. Newer vehicles tend to be more energy efficient, so new cars and the vehicle fleet as a whole are considered separately. For the vehicle fleet as a whole, the UK has the second lowest energy intensity of 6.05 litres/100km (equivalent to 47 miles per gallon), which is 11 per cent below the EU average[13]. The UK new car consumption rate is 5.12 litres/100km (equivalent to 55 miles per gallon), comparable to the EU average of 4.97 litre/100km. the data would imply that UK drivers have more energy intensive vehicles e.g. larger vehicles but a more modern fleet. In the UK the average age of cars since 1st registration was 7.9 years in 2014[14].

In the UK energy consumption for new cars decreased by 26 per cent between 2004 and 2014. For the car fleet as a whole consumption fell by 17 per cent, between 2003 and 2013. This is compared to an EU average of 23 per cent for new cars and 10 per cent for all cars.

Diesel is a more efficient fuel than petrol, and the share of the whole fleet in the UK propelled by diesel was 36 per cent in 2014, which is double the share from 2004.[15]

Chart 7: Specific consumption of litres/100 km for new cars and total fleet, 2014[16]



Source: ODYSSEE

The UK has the eighth lowest percentage share of public transport in total land passenger transport, accounting for 15 per cent of all traffic. This has increased 3 percentage points from 12 per cent in 2004. The EU average remained stable at 18 per cent of public transport in total land passenger from 2004 to 2014.

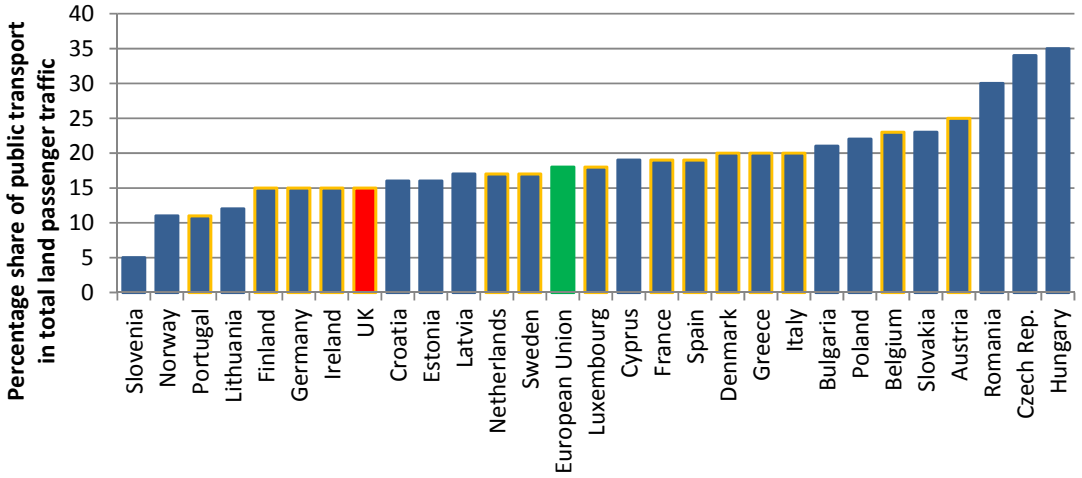
[13] UK figure is from 2013 for total fleet figures.

[14] Department for Transport Road Traffic Survey - www.gov.uk/government/uploads/system/uploads/attachment_data/file/184161/veh0211.xls

[15] Department for Transport Table VEH0203: www.gov.uk/government/uploads/system/uploads/attachment_data/file/301636/veh0203.xls

[16] Note: Data for total fleet consumption in the UK are for 2013, for Portugal and Finland data are for 2012, for Hungary and Slovakia data are for 2010. For new cars data for Romania are for 2011.

Chart 8: Percentage share of public transport in total land passenger transport, 2014[17]



Source: ODYSSEE

Conclusion

Energy consumption in the UK has reduced in each main sector over the 10 years between 2004 and 2014.

In the domestic sector, the UK was more energy intensive in 2014 than the EU average, but there has been a greater reduction in domestic energy intensity in the 10 years between 2004 and 2014 in the UK (26 per cent) compared to the EU (17 per cent).

After adjusting for structural changes within manufacturing, the UK energy intensity fell by 29 per cent from 2004 to 2014. The energy intensity of manufacturing in the cement sector has increased from 2004 to 2014, however the energy intensity of manufacturing in the steel sector reduced over the same time period, most likely due to the 5 per cent increase in output for this sector in the UK.

Improvements in energy intensity in the service sector have meant that while this sector has increased its GVA by 20 per cent between 2004 and 2014, energy intensity has been reduced by 22 per cent.

In transport, the intensity of the car fleet as a whole has reduced by 17 per cent in the UK compared to 10 per cent in the EU. In the UK the percentage of the fleet fuelled by diesel more than doubled between 2004 and 2014, and average time since first registration is just 7.9 years. Faster replacement of the car stock leads to a more energy efficient fleet, contributing to the fact that UK average energy consumption for the entire car fleet is the second lowest in the EU.

The UK compares favourably for energy intensity of the manufacturing and services sectors to countries such as Germany and France, which have similar climates and economic factors. In other sectors such as energy consumption in households and transport, UK energy intensities are at similar levels to France and Germany. Between 2004 and 2014 the UK saw larger reductions in energy intensities than both France and Germany in manufacturing, services and households.

[17] Note: Data for Belgium, Ireland and Slovakia are for 2013. Data for Portugal are for 2012.

For further information on International Energy Efficiency statistics, please contact:

Sam Rushbrook
BEIS
Tel: 0300 068 6131
E-mail: Sam.Rushbrook@beis.gov.uk

Stephen Oxley
BEIS
Tel: 0300 068 5025
E-mail: Stephen.Oxley@beis.gov.uk

Nuclear capacity in the UK

This article looks at UK nuclear electricity generation capacity from the 1950's to 2016, and how capacity would fall off as existing nuclear plants close. Proposed plants not yet approved are not covered here.

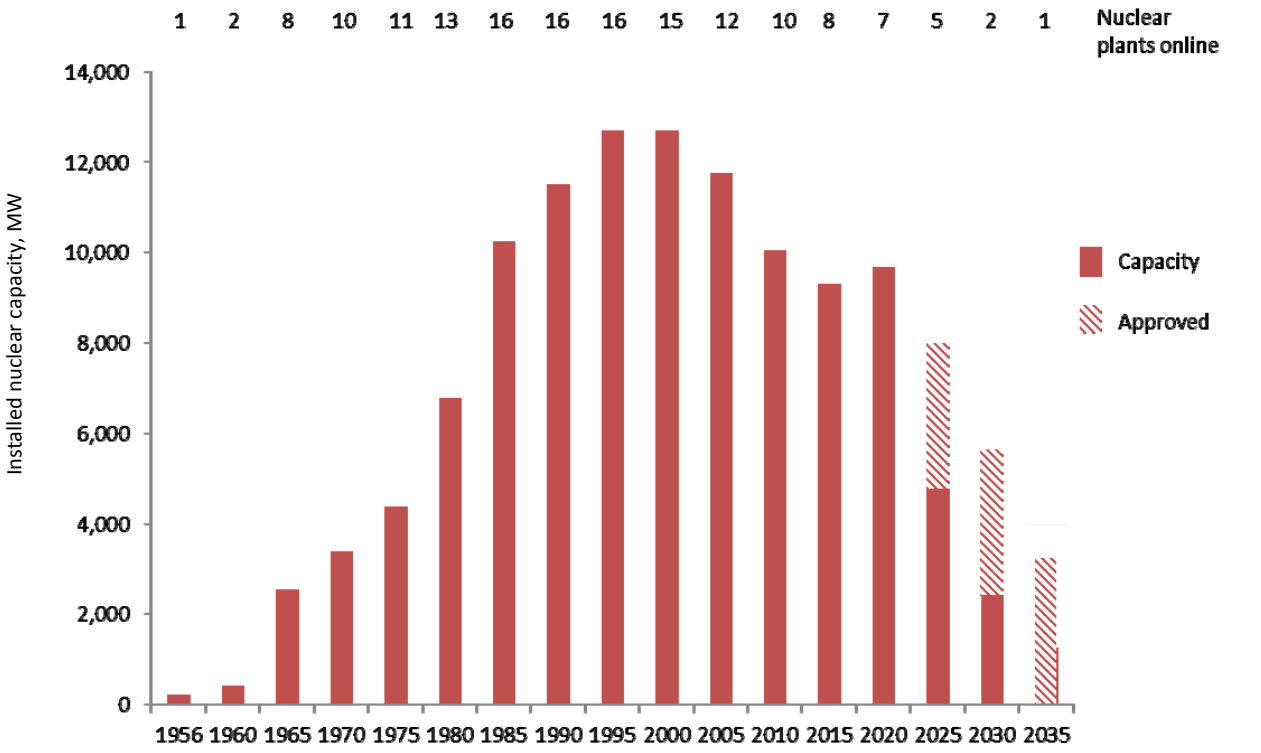
Key points

- The first nuclear power station opened in 1956 with installed capacity of 220 MW[1]. This capacity contributed 0.9 per cent to total UK installed capacity[2] at the time.
- Peak nuclear capacity was in 1994, at 17 per cent of total installed capacity.
- Based on power stations operational at the end of May 2016, nuclear installed capacity was 9,308 MW, 9 per cent of installed capacity.
- Nuclear's share of generation in 2016 was 21 per cent, greater than installed capacity might indicate. This is because the nuclear's uptime is high – its load factor was 77 per cent.

Nuclear power stations in the UK

In 1956, Calder Hall was the first nuclear plant to supply electricity to the public supply grid, followed by Chapelcross in 1959. A further 17 nuclear plants came online over the next four decades: eight in the 60's, three in the 70's, and five in the 80's. The most recent plant built in the UK is Sizewell B, which opened in 1995. Plant numbers peaked at 18 in 1988 whilst peak nuclear installed capacity was 12.7 GW in 1994. Since then the rate of plant closures has outstripped openings and capacity has fallen. Hinkley Point C is currently the only approved nuclear power station with an operating date beyond 2035.

Chart 1: UK installed nuclear capacity and plants online, 1956-2035[3]



[1] Power stations in the United Kingdom, May 2016 (DUKES 5.10), www.gov.uk/government/statistics/electricity-chapter-5-digest-of-united-kingdom-energy-statistics-dukes

[2] Historical electricity data: 1920 to 2015, www.gov.uk/government/statistical-data-sets/historical-electricity-data-1920-to-2011

[3] Power stations in the United Kingdom, May 2016 (DUKES 5.10), www.gov.uk/government/statistics/electricity-chapter-5-digest-of-united-kingdom-energy-statistics-dukes

Table 1: Nuclear power stations in the UK supplying electricity to the public distribution network, 1956 - 2016

Power station	Opening date	Closed / Planned closure	Installed capacity (MW)	Current status
Calder Hall	1956	2003	220	Closed
Chapelcross	1959	2004	196	Closed
Berkeley	1962	1989	276	Closed
Bradwell	1962	2002	242	Closed
Hunterston A	1964	1989	180	Closed
Dungeness A	1965	2006	450	Closed
Trawsfynydd	1965	1991	470	Closed
Hinkley Point A	1965	2000	500	Closed
Sizewell A	1966	2006	420	Closed
Oldbury	1967	2012	434	Closed
Wylfa	1971	2015	980	Closed
Hinkley Point B	1976	2023	1220	Operational
Hunterston B	1976	2023	1190	Operational
Hartlepool	1983	2024	1210	Operational
Heysham1	1983	2024	1150	Operational
Dungeness B	1983	2028	1110	Operational
Heysham2	1988	2030	1250	Operational
Torness	1988	2030	1250	Operational
Sizewell B	1995	2035	1188	Operational
Hinkley Point C	2023	2083	3200	Approved

Nuclear capacity vs total capacity: past, present & future

Total installed electricity generation capacity has been on an upward trend since 1955 with some fluctuations over the years (chart 2). Total installed capacity in 2016 was four times larger than that in 1955. Over the same period installed nuclear capacity rose from a zero base in 1955, peaked at 12.7 GW in 1994 before falling back to 9.3 GW in 2016. Chart 2 shows that the proportion of total capacity made up by nuclear capacity has been falling since its peak level of 17 per cent in 1994. In 2016 nuclear's share was 9 per cent of total generation capacity (chart 3). The opening of the 3.2 GW plant Hinkley Point C in 2023 is expected to boost the share until existing capacity closes. There are several proposals for new nuclear plants at various stages of planning. These have not been included in this analysis.

Chart 2: Nuclear capacity as a proportion of total capacity, 1955-2016

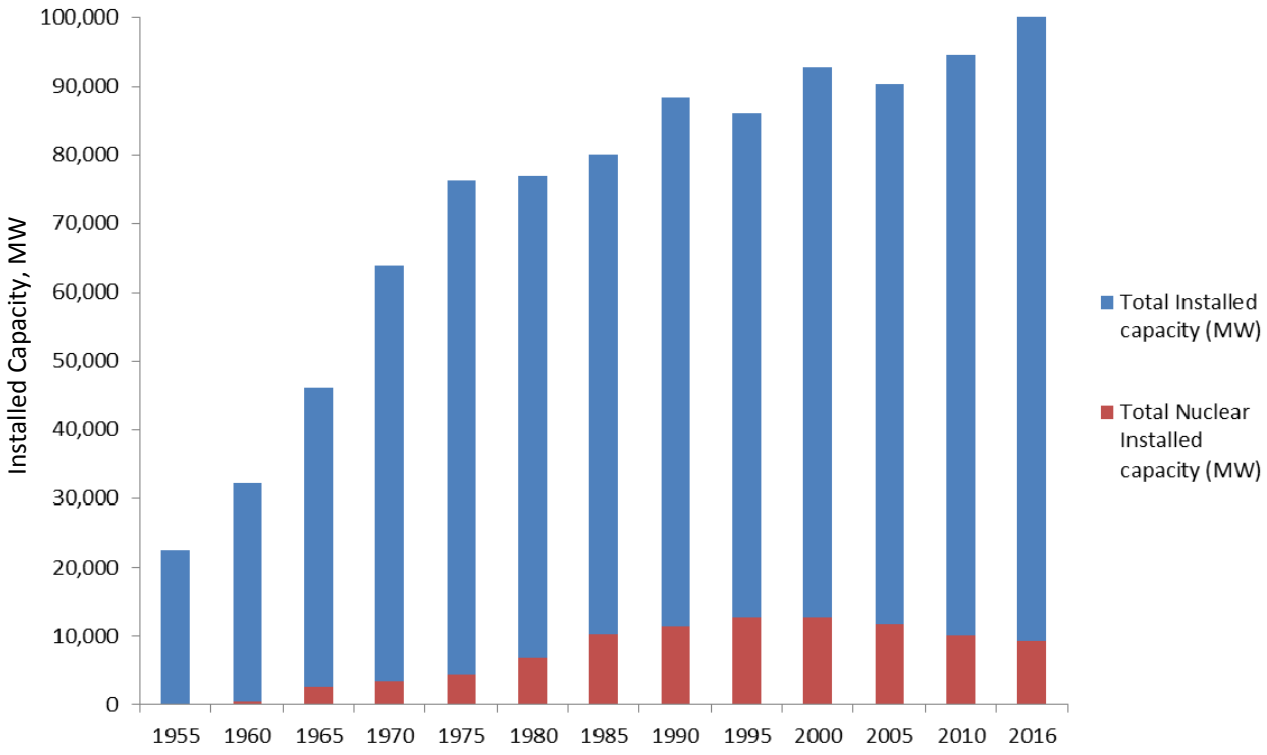
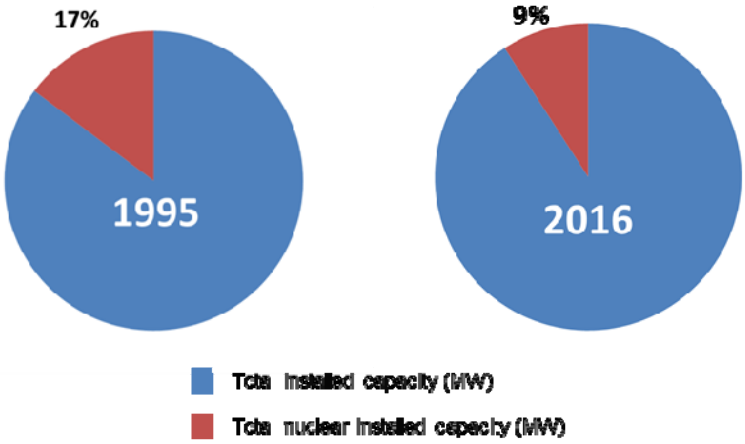


Chart 3: Nuclear capacity as a proportion of total capacity, 1995 vs 2016



Whilst nuclear's share of capacity was 9 per cent in 2016, its share of UK electricity generation was 21 per cent. In 1995 nuclear's share of capacity was 17 per cent and its share of UK generation was 26 per cent. Nuclear plants generated electricity for a relatively high proportion of time compared to other technologies. In 2016 nuclear's load factor was 77 per cent, calculated as the total electricity generated as a proportion of potential generation, given the average capacity over the year. This compares to provisional average load factors of 46 per cent for gas-fired generation by major power producers, 22 per cent for coal, 24 per cent for onshore wind, 37 per cent for offshore wind and 11 per cent for solar in 2016.

User feedback

We welcome all feedback from users; therefore, if you have any comments or queries regarding this analysis, please contact either Ravina Singh or Stephen Ashcroft using the contact details below.

Ravina Singh
Energy Statistics
Tel : 0300 068 5046
E-mail: Ravina.Singh@beis.gov.uk

Stephen Ashcroft
Energy Statistics
Tel: 0300 068 2928
E-mail: Stephen.Ashcroft@beis.gov.uk

Digest of United Kingdom Energy Statistics (DUKES) 2017 – proposed changes

Background

The 2017 edition of the Digest of United Kingdom Energy Statistics (DUKES) will be published on 27 July 2017. For this edition BEIS propose to make a number of changes.

Detail of proposed changes

Subject to the views of users BEIS propose to make the following changes:

a) Remove table 1.8, Final energy consumption by main industrial groups, from the publication as data is readily available elsewhere in DUKES, as well as in the industrial sector section of Energy Consumption in the UK.

b) Move table 1.9, Fuels consumed for electricity generation (autogeneration) by main industrial groups, to Chapter 5 of DUKES.

c) Move table 5.11, Large scale CHP in the United Kingdom, to Chapter 7 of DUKES.

New table numbers for items b) and c) within their new DUKES chapters have yet to be determined, but a list showing the tables in the order in which they appear in the 2017 edition of DUKES, and their corresponding numbers in previous editions will be included in the introductory section of DUKES 2017.

d) Include biomethane injections to the grid in the gas commodity balances using data collected by BEIS in the compiliation of Renewable Heat Incentive statistics.

e) Include revisions to commodity balance data for all fuels for 2014 and 2015, with additional revisions back to 2013 for coal in respect of trade data, 2008 for gas to reflect the correct allocation of supply between UK production and Norwegian imports, and 2010 for renewable electricity following receipt of revised data from Ricardo.

f) Remove the commentary in the long-term trends annexes for chapters 1 to 7. Instead any significant long-term trends will be highlighted in the main chapters; the long-term trends commentary in the annexes will then only be updated every 5 years, with the next update taking place in 2021.

Database

As a result of previous user consultations BEIS are developing a database of key DUKES series which it is anticipated will be made available to users alongside the publication of DUKES 2017 on 27 July 2017.

User feedback

BEIS welcome feedback from all users; therefore, if you have any comments or queries regarding the proposed changes to DUKES please contact Kevin Harris using the contact details below.

Kevin Harris
Energy Statistics
Tel: 0300 068 5041
E-mail: Kevin.Harris@beis.gov.uk

Recent and forthcoming publications of interest to users of energy statistics

Sub-national electricity and gas consumption at LSOA, MSOA and IGZ level, 2015

This publication comprising a series of Excel spreadsheets provides details of domestic and non-domestic electricity and gas consumption at Lower Super Output Area (LSOA), Middle Super Output Area (MSOA) and Intermediate Geography Zone (IGZ) for 2015. The data was published on 26 January 2017 for electricity at:
www.gov.uk/government/statistics/lower-and-middle-super-output-areas-electricity-consumption
and gas at:
www.gov.uk/government/statistics/lower-and-middle-super-output-areas-gas-consumption

Greenhouse Gas Emissions final 2015 statistics

This publication provides final estimates of UK greenhouse gas emissions going back to 1990. Estimates are presented by source in February of each year and are updated in March of each year to include estimates by end-user and fuel type. Final 2015 UK greenhouse gas emissions statistics were published on 7 February 2017 at:
www.gov.uk/government/collections/final-uk-greenhouse-gas-emissions-national-statistics

Household Energy Efficiency statistics

This series presents statistics on the Energy Company Obligation (ECO), Green Deal and homes insulated. 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 latest release was published on 30 March 2017 at:
www.gov.uk/government/collections/household-energy-efficiency-national-statistics

Greenhouse Gas Emissions provisional 2016 statistics

This publication provides the latest annual provisional estimates of UK greenhouse gas emissions based on provisional inland energy consumption statistics as published in Energy Trends. A quarterly emissions time series is also included within this publication. Provisional 2016 UK greenhouse gas emissions statistics were published on 30 March 2017 at:
www.gov.uk/government/collections/provisional-uk-greenhouse-gas-emissions-national-statistics

Smart Meters quarterly statistics

This publication provides estimates of the number of Smart Meters installed and operating in homes and businesses in Great Britain. The latest release, covering estimates of the number of Smart Meters deployed up to the end of December 2016, was published on 30 March 2017 at:
www.gov.uk/government/collections/smart-meters-statistics

Local authority carbon dioxide emissions

This annual publication provides estimates of local authority carbon dioxide emissions in the United Kingdom. Data for 2015 will be released on 29 June 2017 at:
www.gov.uk/government/collections/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics

Sub-national road transport consumption

This annual publication provides estimates of road transport fuel consumption in the United Kingdom, by vehicle and fuel type. Data for 2015 will be released on 29 June 2017 at:
www.gov.uk/government/collections/road-transport-consumption-at-regional-and-local-level

List of special feature articles published in Energy Trends between March 2016 and December 2016

Subject	Title
Energy	
March 2016	Understanding growth rates in primary energy consumption
	Analysis of UK greenhouse gas emissions and economic growth
Coal	
September 2016	Coal in 2016
Combined Heat and Power (CHP)	
June 2016	Combined Heat and Power using renewable fuels
September 2016	Combined Heat and Power in Scotland, Wales, Northern Ireland and the regions of England in 2015
Electricity	
September 2016	Competition in UK electricity markets
December 2016	Electricity generation and supply figures for Scotland, Wales, Northern Ireland and England, 2012 to 2015
Energy efficiency	
December 2016	Building Energy Efficiency Survey
Energy prices	
March 2016	Domestic energy bills in 2015: The impact of variable consumption
June 2016	Fixed tariffs within the energy market
September 2016	International energy price comparisons
Feed-in Tariffs	
December 2016	Feed-in Tariff load factor analysis, 2011/12 to 2015/16
Gas	
June 2016	Changes to the oil and gas tables
September 2016	Competition in gas supply
December 2016	Physical gas flows across Europe and diversity of gas supply in 2015

Petroleum (oil and oil products)

March 2016	Consultation on DECC's oil and gas statistical tables
June 2016	Changes to the oil and gas tables
September 2016	Diversity of supply for oil and oil products in OECD countries in 2015 New methodology for estimating inland deliveries of road fuels and gas oil

Renewables

June 2016	Renewable energy in 2015
September 2016	Renewable electricity in Scotland, Wales, Northern Ireland and the regions of England in 2015

UK Continental Shelf (UKCS)

March 2016	UKCS capital expenditure survey 2015

PDF versions of the special feature articles appearing in Energy Trends since 2013 can be accessed on the BEIS section of the GOV.UK website at:
www.gov.uk/government/collections/energy-trends-articles

Articles published before 2013 can be accessed via the National Archives version of the BEIS website at:
http://webarchive.nationalarchives.gov.uk/20130109092117/http:/decc.gov.uk/en/content/cms/statistics/publications/trends/articles_issue/articles_issue.aspx

Explanatory notes

General

More detailed notes on the methodology used to compile the figures and data sources are available on the BEIS section of the GOV.UK website.

Symbols used in the tables

.. not available
- nil or not separately available
p provisional
r revised; where a column or row shows 'r' at the beginning, most, but not necessarily all, of the data have been revised.
e estimated; totals of which the figures form a constituent part are therefore partly estimated

Notes to tables

- Figures for the latest periods and the corresponding averages (or totals) are provisional and are liable to subsequent revision.
- The figures have not been adjusted for temperature or seasonal factors except where noted.
- Due to rounding the sum of the constituent items may not equal the totals.
- Percentage changes relate to the corresponding period a year ago. They are calculated from unrounded figures but are shown only as (+) or (-) when the percentage change is very large.
- Quarterly figures relate to calendar quarters.
- All figures relate to the United Kingdom unless otherwise indicated.

- Further information on Oil and Gas is available from The Oil & Gas Authority at: www.ogauthority.co.uk/

Conversion factors

1 tonne of crude oil =	7.55 barrels
1 tonne =	1,000 kilograms
1 gallon (UK) =	4.54609 litres
1 kilowatt (kW) =	1,000 watts
1 megawatt (MW) =	1,000 kilowatts
1 gigawatt (GW) =	1,000 megawatts
1 terawatt (TW) =	1,000 gigawatts

All conversion of fuels from original units to units of energy is carried out on the basis of the gross calorific value of the fuel. More detailed information on conversion factors and calorific values is given in Annex A of the Digest of United Kingdom Energy Statistics.

Conversion matrices

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

To:	**Thousand toe**	**Terajoules**	**GWh**	**Million therms**
From	**Multiply by**			
Thousand toe	1	41.868	11.630	0.39683
Terajoules (TJ)	0.023885	1	0.27778	0.0094778
Gigawatt hours (GWh)	0.085985	3.6000	1	0.034121
Million therms	2.5200	105.51	29.307	1

To:	**Tonnes of oil equivalent**	**Gigajoules**	**kWh**	**Therms**
From	**Multiply by**			
Tonnes of oil equivalent	1	41.868	11,630	396.83
Gigajoules (GJ)	0.023885	1	277.78	9.4778
Kilowatt hours (kWh)	0.000085985	0.003600	1	0.034121
Therms	0.0025200	0.105510	29.307	1

Note that all factors are quoted to 5 significant figures

Abbreviations

ATF	Aviation turbine fuel
CCGT	Combined cycle gas turbine
DERV	Diesel engined road vehicle
LNG	Liquefied natural gas
MSF	Manufactured solid fuels
NGLs	Natural gas liquids
UKCS	United Kingdom continental shelf

Sectoral breakdowns

The categories for final consumption by user are defined by the Standard Industrial Classification 2007, as follows:

Fuel producers	05-07, 09, 19, 24.46, 35
Final consumers	
Iron and steel	24 (excluding 24.4, 24.53 and 24.54)
Other industry	08, 10-18, 20-23, 24.4 (excluding 24.46), 24.53, 24.54, 25-33, 36-39, 41-43
Transport	49-51
Other final users	
Agriculture	01-03
Commercial	45-47, 52-53, 55-56, 58-66, 68-75, 77-82
Public administration	84-88
Other services	90-99
Domestic	Not covered by SIC 2007

Department for Business, Energy & Industrial Strategy
1 Victoria Street, London SW1H 0ET
www.gov.uk/beis