



Department  
of Energy &  
Climate Change



# ENERGY TRENDS

## JUNE 2016



30 June 2016

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**Explanatory notes are to be found inside the back cover**

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# Introduction

Energy Trends and Energy Prices are produced by the Department of Energy and Climate Change (DECC) on a quarterly basis. Both periodicals are published concurrently in June, September, December and March. The June editions cover the first quarter of the current year.

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 2015 edition of the Digest was published on 30 July 2015. Printed and bound copies of the 2015 Digest can be obtained from The Stationery Office and an electronic version is available on the DECC section of the GOV.UK website at: [www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes](http://www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes)

The 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 DECC, 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 DECC 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 DECC section of the GOV.UK website. Both sets of tables can be accessed at:

[www.gov.uk/government/organisations/department-of-energy-climate-change/about/statistics](http://www.gov.uk/government/organisations/department-of-energy-climate-change/about/statistics)

Annual data for 2015 included within this edition is on a provisional basis. New data are continually received and revisions to previous data made. Finalised figures for 2015 will be published on the 28 July 2016 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. Foreign Trade and Weather tables are, however, available on the DECC section of the GOV.UK website at:

[www.gov.uk/government/organisations/department-of-energy-climate-change/about/statistics](http://www.gov.uk/government/organisations/department-of-energy-climate-change/about/statistics).

Information on Prices can be found in the Energy Prices publication and on the DECC section of the GOV.UK website at: [www.gov.uk/government/collections/quarterly-energy-prices](http://www.gov.uk/government/collections/quarterly-energy-prices)

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

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**The main points for the first quarter of 2016:**

- Total energy production was 4.4 per cent higher than in the first quarter of 2015.
- Oil production rose by 17.3 per cent when compared with the first quarter of 2015, boosted by the opening of new fields in 2015.
- Natural gas production was 6.0 per cent higher than in the first quarter of 2015. Gas imports increased by 1.7 per cent to meet increased demand, within which LNG imports rose by 2.4 per cent.
- Coal production in the first quarter of 2016 was 69 per cent lower than the first quarter of 2015, due to mines closing and some other mines producing less coal as they are coming to the end of operation. Coal imports were 76 per cent lower as generators' demand for coal fell by 50 per cent.
- Total primary energy consumption for energy fell by 4.4 per cent. However, when adjusted to take account of weather differences between the first quarter of 2015 and the first quarter of 2016, total primary energy consumption fell by 2.5 per cent.
- Temperatures in the quarter were on average 0.5 degrees warmer than a year earlier, with average temperatures in both January and February being warmer than a year earlier.
- Final energy consumption (excluding non-energy use) was 1.2 per cent lower than in the first quarter of 2015. Domestic consumption fell by 3.4 per cent due to warmer weather. On a seasonally and temperature adjusted basis final energy consumption rose by 0.4 per cent.
- Gas demand was 5.0 per cent higher than the first quarter of 2015 driven by an increase in use by electricity generators, whilst electricity consumption was 0.3 per cent lower than in the first quarter of 2015.
- Electricity generated in the first quarter of 2016 fell by 3.4 per cent, from 95.8 TWh a year earlier to 92.5 TWh.
- Coal's share of generation decreased from 30.8 per cent to a record low of 15.8 per cent, whilst gas's share rose from 24.7 per cent to 37.8 per cent. Nuclear's share of generation fell from 19.0 per cent in the first quarter of 2015 to 18.7 per cent in the first quarter of 2016.
- Low carbon electricity's share of generation increased from 41.8 per cent in the first quarter of 2015 to 43.8 per cent in the first quarter of 2016.
- Renewables' share of electricity generation increased to 25.1 per cent, compared to the 22.8 per cent share in the first quarter of 2015, mostly due to increased capacity.
- Renewable electricity generation was 23.2 TWh in the first quarter of 2016, an increase of 6.4 per cent on the same period a year earlier.
- In the first quarter of 2016, 0.1 GW of installed capacity was confirmed on the Feed in Tariff scheme, increasing the total to 5.0 GW, across 833,785 installations.

## Section 1 - Total Energy

### Key results show:

Total energy production was 4.4 per cent higher than in the first quarter of 2015, with further growth in UKCS production. **(Charts 1.1 & 1.2)**

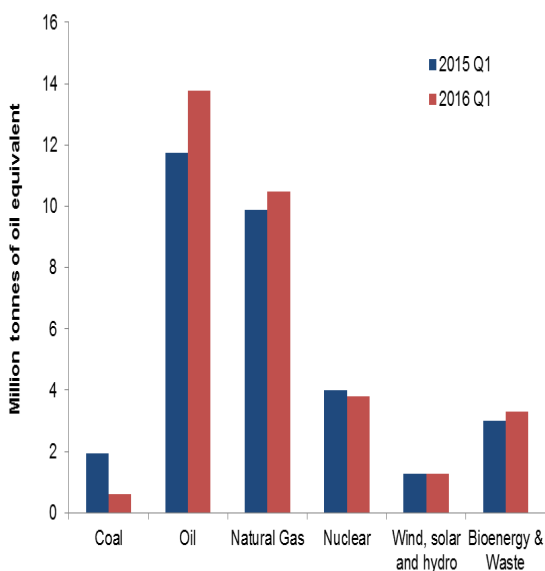
Total primary energy consumption for energy uses fell by 4.4 per cent. However, when adjusted to take account of weather differences between the first quarter of 2015 and the first quarter of 2016, primary energy consumption fell by 2.5 per cent. **(Chart 1.3)**

Final consumption fell by 0.4 per cent compared to the first quarter of 2015. Domestic consumption fell by 3.4 per cent reflecting the warmer weather in the quarter, industrial consumption fell by 6.0 per cent, other final users' consumption fell by 1.2 per cent, whilst transport consumption rose by 4.3 per cent. **(Chart 1.4)**

Net import dependency was 34.5 per cent, down 9.4 percentage points from the first quarter of 2015. **(Chart 1.6)**

Fossil fuel dependency was 82.5 per cent in the first quarter of 2016. **(Chart 1.7)**

**Chart 1.1 Production of indigenous primary fuels**



Total production in the first quarter of 2016 stood at 33.3 million tonnes of oil equivalent, 4.4 per cent higher than in the first quarter of 2015.

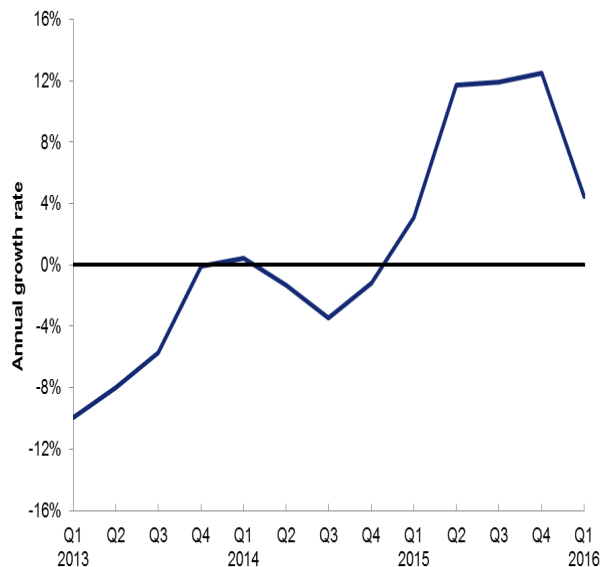
Production of oil rose by 17.3 per cent compared to the first quarter of 2015, due to new fields coming online but also due to reduced production in February 2015, while production of natural gas rose by 6.0 per cent.

Primary electricity output in the first quarter of 2016 was 3.3 per cent lower than in the first quarter of 2015, within which nuclear electricity output was 4.6 per cent lower due to the closure of Wylfa at the end of December 2015 and output from wind and natural flow hydro was 0.9 per cent higher.

Production of bioenergy and waste was 9.8 per cent higher compared to the first quarter in 2015.

Coal production fell by 68 per cent due to mines closing and some other mines producing less coal as they come to the end of their operational life.

**Chart 1.2 UK production (annual growth rate)**



In the first quarter of 2016, the annual growth rate of UK production was 4.4 per cent, up 1.3 percentage points compared to the first quarter of 2015, but down on the strong growth levels seen in quarters 2, 3 and 4 of 2015.

The growth in the first quarter of 2016 was the result of increases in oil, gas and bioenergy production.

**Chart 1.3 Total inland consumption (primary fuel input basis)<sup>(1)</sup>**



<sup>(1)</sup> Seasonally adjusted and temperature corrected annual rates

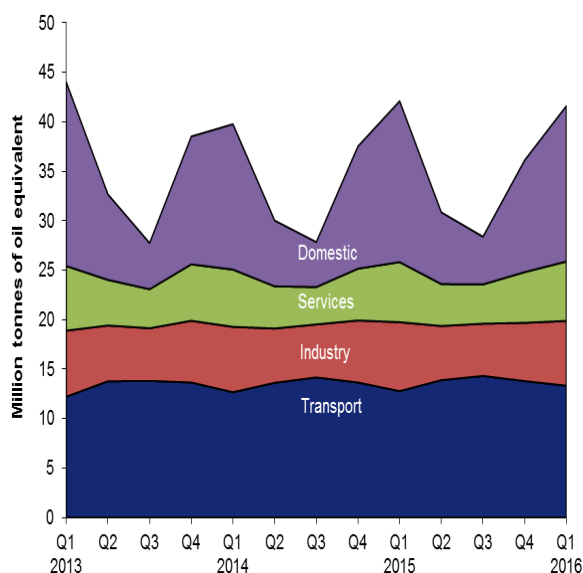
Total inland consumption on a primary fuel input basis (temperature corrected, seasonally adjusted annualised rate), was 197.4 million tonnes of oil equivalent in the first quarter of 2016, 2.5 per cent lower than in the first quarter of 2015. On an unadjusted basis inland consumption was 4.4 per cent lower due to the warmer weather. The average temperature in the first quarter of 2016 was 5.6 degrees Celcius, 0.5 degrees Celsius higher than the same period a year earlier.

Between the first quarter of 2015 and the first quarter of 2016 (on a seasonally adjusted and temperature corrected basis) coal and other solid fuel consumption fell by 45 per cent as demand fell from electricity generators and UK steelworks.

Also on a seasonally adjusted and temperature corrected basis, between the first quarter of 2015 and the first quarter of 2016, oil consumption rose by 0.9 per cent, whilst natural gas consumption rose by 9.0 per cent with increased demand from electricity generators.

On the same basis, bioenergy consumption rose by 13.5 per cent between the first quarter of 2015 and the first quarter of 2016, whilst primary electricity consumption fell by 1.5 per cent, within which nuclear consumption fell by 4.4 per cent.

**Chart 1.4 Final energy consumption by user**



Total final consumption fell by 0.4 per cent between the first quarter of 2015 and the first quarter of 2016.

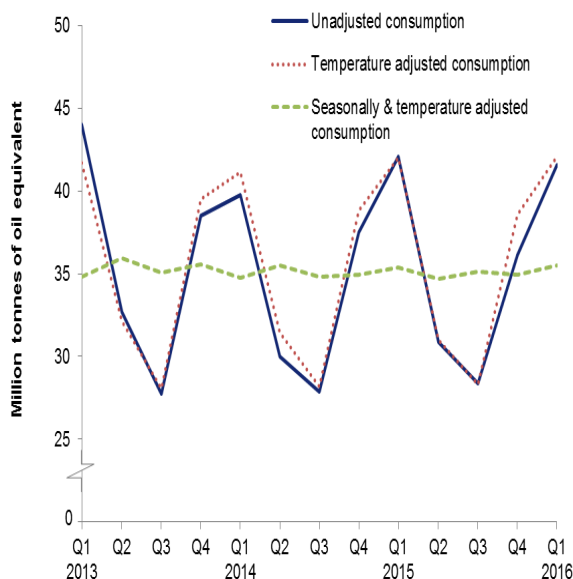
Domestic sector energy consumption fell by 3.4 per cent, reflecting the warmer weather compared to a year earlier.

Service sector energy consumption fell by 1.2 per cent.

Industrial sector energy consumption fell by 6.0 per cent.

Transport sector energy consumption rose by 4.3 per cent.

**Chart 1.5 Seasonally adjusted and temperature corrected final energy consumption**



Total unadjusted final energy consumption (excluding non-energy use) fell by 1.2 per cent between the first quarter of 2015 and the first quarter of 2016.

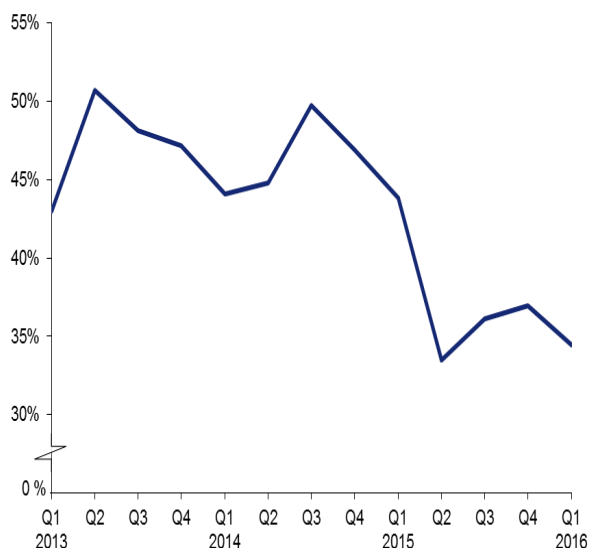
On a seasonally and temperature adjusted basis final energy consumption (excluding non-energy use) rose by 0.4 per cent between the first quarter of 2015 and the first quarter of 2016.

Unadjusted domestic consumption fell by 3.4 per cent over the same period, and was down 0.6 per cent on a temperature and seasonally adjusted basis.

Consumption data by fuel and sector is available in the table ET 1.3c on the DECC section of the GOV.UK website at:

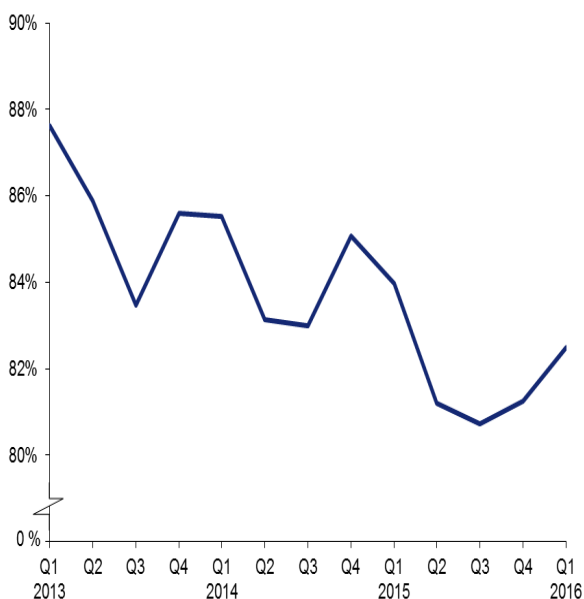
[www.gov.uk/government/statistics/total-energy-section-1-energy-trends](http://www.gov.uk/government/statistics/total-energy-section-1-energy-trends)

**Chart 1.6 Net import dependency**



In the first quarter of 2016, imports fell by 8.8 per cent, whilst exports rose by 15.9 per cent. As a result, net import dependency fell 9.4 percentage points from the first quarter of 2015 to 34.5 per cent.

**Chart 1.7 Fossil fuel dependency**



In the first quarter of 2016 fossil fuel dependency was 82.5 per cent, down 1.5 percentage points from the first quarter of 2015.

### Relevant tables

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# 1 TOTAL ENERGY

**TABLE 1.1. Indigenous production of primary fuels**

*Million tonnes of oil equivalent*

		Total	Coal <sup>1</sup>	Petroleum <sup>2</sup>	Natural gas <sup>3</sup>	Bioenergy & waste <sup>4,5</sup>	Primary electricity	
							Nuclear	Wind, solar and hydro <sup>6</sup>
2011		137.3	11.5	56.9	45.3	6.1	15.6	1.86
2012		122.6	10.6	48.8	38.9	6.8	15.2	2.28
2013		115.1r	8.0	44.5	36.5	7.7r	15.4	3.02
2014		113.6r	7.3	43.7	36.8	8.3r	13.9	3.60
2015 p		124.5r	5.4r	49.5	39.6r	9.9r	15.5r	4.66r
Per cent change		+9.6	-26.1	+13.4	+7.6	+18.1	+11.8	+29.3
2015	Quarter 1	31.9r	2.0r	11.7	9.9	3.0r	4.0r	1.27
	Quarter 2	32.2r	1.5	13.2	10.4	2.2r	3.7	1.11
	Quarter 3	27.6r	0.9	11.4	8.8	2.0r	3.6	0.94
	Quarter 4	32.9r	1.0	13.2	10.5r	2.7	4.1r	1.33r
2016	Quarter 1 p	33.3r	0.6	13.8	10.5	3.3r	3.8	1.29r
Per cent change <sup>7</sup>		+4.4	-68.5	+17.3	+6.0	+9.8	-4.6	+0.9

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](http://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 <sup>1</sup>	Petroleum <sup>2</sup>	Natural gas <sup>3</sup>	Bioenergy & waste <sup>4,5</sup>	Nuclear	Wind, solar and hydro <sup>6</sup>	Net imports			Total	Coal	Petroleum	Natural gas	Bioenergy & waste	Nuclear	Wind, solar and hydro	Net imports
		Unadjusted <sup>7</sup>								Seasonally adjusted and temperature corrected <sup>8,9</sup> (annualised rates)									
2011		203.5	32.2	67.8	77.6	7.7	15.6	1.86	0.53	209.0	34.0	67.8	81.5	7.7	15.6	1.86	0.53		
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	65.8r	72.7	9.6r	15.4	3.02	1.24	204.1	38.4r	65.8r	70.6	9.6r	15.4	3.02	1.24		
2014		193.9r	31.6	65.8r	66.1	11.2r	13.9	3.60	1.76	199.2r	33.2r	65.8r	69.9	11.2r	13.9	3.60	1.76		
2015 p		194.8r	25.1r	66.7r	67.9r	13.2r	15.5r	4.66r	1.80	197.6r	25.5r	66.7r	70.2r	13.2r	15.5r	4.66r	1.80		
Per cent change		+0.4	-20.7	+1.4	+2.7	+18.1	+11.8	+29.3	+2.0	-0.8	-23.0	+1.4	+0.5	+18.1	+11.8	+29.3	+2.0		
2015	Quarter 1	58.7r	9.1	16.4r	23.8	3.7r	4.0r	1.27	0.42	202.5r	30.6r	65.4r	70.4r	14.8r	15.4r	4.28r	1.69		
	Quarter 2	44.2	5.6r	16.4	13.9	3.0r	3.7	1.11	0.48	194.4r	27.2	65.6r	67.9	12.0r	14.7r	5.10r	1.91		
	Quarter 3	41.2r	4.6r	17.0r	11.6	2.8r	3.6	0.94	0.51	195.9r	23.3r	68.1r	71.3r	11.4r	14.9r	4.90	2.03		
	Quarter 4	50.7r	5.7	16.9r	18.6r	3.7r	4.1r	1.33r	0.40	197.4r	21.1r	67.5r	71.4r	14.6r	16.9r	4.34r	1.58		
2016	Quarter 1 p	56.1r	4.9r	16.5r	24.9	4.2r	3.8	1.29r	0.52	197.4r	16.9r	66.0r	76.7r	16.8r	14.7r	4.26r	2.06		
Per cent change <sup>10</sup>		-4.4	-46.3	+0.9	+4.5	+13.5	-4.6	+0.9	+22.3	-2.5	-44.7	+0.9	+9.0	+13.5	-4.4	-0.5	+22.3		

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](http://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](http://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

	2014	2015 p	per cent change <sup>1</sup>	2014 1st quarter	2014 2nd quarter	2014 3rd quarter	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter p	per cent change <sup>1</sup>
<b>SUPPLY</b>													
Indigenous production	113,626r	124,547r	+9.6	30,897r	28,784r	24,695r	29,251r	31,852r	32,157r	27,636r	32,903r	33,261	+4.4
Imports	164,955r	154,846r	-6.1	43,719r	39,179r	38,650r	43,407r	43,766r	35,233r	36,170r	39,676r	39,917	-8.8
Exports	-70,629r	-76,667r	+8.5	-17,952	-18,258	-16,948	-17,471r	-16,955r	-19,532r	-20,270r	-19,910r	-19,651	+15.9
Marine bunkers	-3,004r	-2,593r	-13.7	-741r	-711r	-740r	-812r	-564r	-720r	-725r	-584r	-483	-14.4
Stock change <sup>2</sup>	-3,935r	2,868r		1,754r	-2,998	-2,763r	72r	2,507r	-960r	479r	841r	+5,294	(+)
<b>Primary supply</b>	<b>201,013r</b>	<b>203,001r</b>	<b>+1.0</b>	<b>57,676r</b>	<b>45,996r</b>	<b>42,893r</b>	<b>54,448r</b>	<b>60,606r</b>	<b>46,178r</b>	<b>43,291r</b>	<b>52,926r</b>	<b>58,338</b>	<b>-3.7</b>
Statistical difference <sup>3</sup>	-374r	523r		-6r	-54r	-218r	-96r	258r	32r	20r	213r	-111	
<b>Primary demand</b>	<b>201,387r</b>	<b>202,478r</b>	<b>+0.5</b>	<b>57,682r</b>	<b>46,050r</b>	<b>43,111r</b>	<b>54,544r</b>	<b>60,348r</b>	<b>46,146r</b>	<b>43,271r</b>	<b>52,713r</b>	<b>58,449</b>	<b>-3.1</b>
Transfers <sup>4</sup>	-3	21r		-1	-5	6	-2	19r	2	3r	-3r	-3	
<b>TRANSFORMATION</b>													
Electricity generation	-39,578r	-37,603r	-5.0	-10,992r	-9,397r	-8,902r	-10,286r	-10,984r	-8,629r	-8,346r	-9,644r	-9,909	-9.8
Heat generation	-1,105r	-1,084r	-1.9	-343r	-240r	-210r	-312r	-350r	-240r	-207r	-287r	-351	+0.2
Petroleum refineries	-505r	-40r	-92.2	-52r	-145r	-196r	-111r	-80r	-6r	12r	34r	1	(-)
Coke manufacture	-334	-176	-47.2	-86	-77	-85	-86	-48	-46	-38	-44	-20	-58.1
Blast furnaces	-2,379	-2,201	-7.5	-644	-573	-626	-537	-665	-647	-485	-404	-407	-38.8
Patent fuel manufacture	-66	-64	-2.4	-17	-17	-18	-15	-10	-18	-17	-20	-21	(+)
Other <sup>6</sup>	-44r	-44r	+0.7	-14r	-8r	-11r	-11r	-10r	-9r	-12r	-12r	-13	+25.1
Energy industry use	11,873r	12,485r	+5.2	3,103r	2,987r	2,808r	2,975r	3,197r	3,115r	3,056r	3,118r	3,004	-6.0
Losses	3,270r	3,147r	-3.7	935r	714r	705r	915r	982r	649r	658r	858r	858	-12.6
<b>FINAL CONSUMPTION</b>													
Iron & steel	1,359r	1,263r	-7.1	359r	345r	338r	317r	369r	343r	291r	260r	248	-32.9
Other industries	22,359r	22,332r	-0.1	6,243r	5,149r	5,015r	5,952r	6,593r	5,127r	4,986r	5,626r	6,299	-4.5
Transport	54,126r	54,810r	+1.3	12,676r	13,623r	14,169r	13,658r	12,791r	13,894r	14,325r	13,800r	13,339	+4.3
Domestic	38,232r	39,623r	+3.6	14,687r	6,648r	4,537r	12,361r	16,265r	7,247r	4,814r	11,297r	15,715	-3.4
Other Final Users	19,063r	19,403r	+1.8	5,791r	4,259r	3,781r	5,232r	6,069r	4,238r	3,969r	5,127r	5,998	-1.2
Non energy use	7,093r	8,223r	+15.9	1,732r	1,868r	1,723r	1,769r	1,944r	1,942r	2,090r	2,247r	2,257	+16.0
<b>DEPENDENCY<sup>6</sup></b>													
Net import dependency	46.2%r	38.0%r		44.1%r	44.8%r	49.7%r	46.9%r	43.8%r	33.5%r	36.1%r	36.9%r	34.5%	
Fossil fuel dependency	84.3%r	82.0%r		85.5%r	83.1%r	83.0%r	85.1%r	84.0%r	81.2%r	80.7%r	81.3%r	82.5%	
Low carbon share	14.3%r	16.5%r		13.3%r	15.4%r	15.4%r	13.7%r	14.8%r	17.1%r	17.3%r	17.4%r	16.1%	

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. See article in the December 2010 edition of Energy Trends.

6. Back-flows from the petrochemical industry - see article in the June 2016 edition of Energy Trends.

# 1 TOTAL ENERGY

## Table 1.3b Supply and use of fuels

*Thousand tonnes of oil equivalent*

	2015 Quarter 1									2016 Quarter 1 p								
	Coal	Manufactured fuels <sup>4</sup>	Primary oil	Petroleum Products	Natural gas <sup>5</sup>	Bioenergy & waste <sup>6</sup>	Primary electricity	Electricity	Heat sold	Coal	Manufactured fuels <sup>4</sup>	Primary oil	Petroleum Products	Natural gas <sup>5</sup>	Bioenergy & waste <sup>6</sup>	Primary electricity	Electricity	Heat sold
<b>SUPPLY</b>																		
Indigenous production	1,952	-	11,749	-	9,880	2,998	5,273	-	-	614	-	13,785	-	10,469	3,293	5,101	-	-
Imports	7,307	215	13,123	8,398	13,473	779	-	470	-	1,772	204	13,002	9,715	13,698	981	-	545	-
Exports	-83	-16	-8,835	-5,479	-2,417	-77	-	-48	-	-83	-4	-11,054	-6,495	-1,913	-74	-	-28	-
Marine bunkers	-	-	-	-564	-	-	-	-	-	-	-	-	-483	-	-	-	-	-
Stock change <sup>1</sup>	-275	+52	-62	-175	+2,966	-	-	-	-	+2,404	-1	-39	+206	+2,725	-	-	-	-
<b>Primary supply</b>	8,901	251	15,975	2,180	23,903	3,700	5,273	422	-	4,707	199	15,694	2,943	24,979	4,199	5,101	516	-
Statistical difference <sup>2</sup>	+104	+3	-45	+140	+56	-42	-	+43	-	+43	-1	-111	+40	-69	+0	-	-12	-
<b>Primary demand</b>	8,797	248	16,021	2,040	23,847	3,743	5,273	379	-	4,664	200	15,805	2,903	25,048	4,199	5,101	528	-
Transfers <sup>3</sup>	-	6	-148	+168	-8	-	-1,274	+1,274	-	-	+10	-613	+610	-11	-	-1,286	+1,286	-
<b>TRANSFORMATION</b>	-8,327	246	-15,873	15,608	-5,105	-2,055	-3,999	6,899	459	-4,209	32	-15,192	14,977	-7,029	-2,545	-3,815	6,604	459
Electricity generation	-7,049	-262	-	-145	-4,407	-2,022	-3,999	6,899	-	-3,544	-142	-	-169	-6,330	-2,512	-3,815	6,604	-
Heat generation	-50	-13	-	-16	-698	-33	-	-	459	-50	-13	-	-16	-698	-33	-	-	459
Petroleum refineries	-	-	-15,978	15,899	-	-	-	-	-	-	-	-15,324	15,325	-	-	-	-	-
Coke manufacture	-885	838	-	-	-	-	-	-	-	-337	317	-	-	-	-	-	-	-
Blast furnaces	-321	-343	-	-	-	-	-	-	-	-240	-167	-	-	-	-	-	-	-
Patent fuel manufacture	-22	26	-	-14	-	-	-	-	-	-39	36	-	-19	-	-	-	-	-
Other <sup>7</sup>	-	-	105	-115	-	-	-	-	-	-	-	132	-145	-	-	-	-	-
Energy industry use	-	222	-	1,054	1,262	-	-	592	68	-	106	-	997	1,289	-	-	544	68
Losses	-	58	-	-	124	-	-	800	-	-	21	-	-	98	-	-	738	-
<b>FINAL CONSUMPTION</b>	470	221	-	16,762	17,349	1,687	-	7,160	382	455	114	-	17,493	16,621	1,654	-	7,136	382
Iron & steel	8	138	-	1	137	-	-	85	-	7	64	-	0	102	-	-	75	-
Other industries	334	7	-	1,121	2,540	364	-	2,053	174	318	0	-	1,084	2,324	329	-	2,070	174
Transport	3	-	-	12,482	-	210	-	96	-	3	-	-	13,019	-	221	-	96	-
Domestic	121	44	-	938	11,462	954	-	2,722	24	119	39	-	918	10,998	935	-	2,682	24
Other final users	4	-	-	420	3,097	159	-	2,204	185	7	-	-	341	3,084	169	-	2,213	185
<b>Non energy use</b>	-	32	-	1,799	113	-	-	-	-	-	11	-	2,132	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. Includes 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.

## Section 2 - Solid Fuels and Derived Gases

### Key results show:

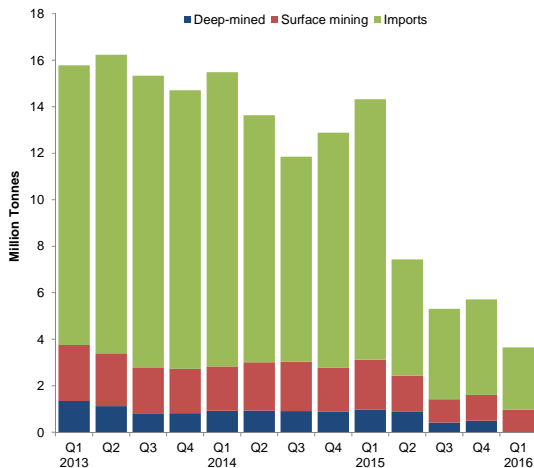
Overall coal production in the first quarter of 2016 was down 69 per cent (-2.1 million tonnes) compared with the first quarter of 2015. This was due to mines closing and some other mines producing less coal as they are coming to the end of operation. Deep-mined and surface mine output both fell to record lows, down 99 per cent and 55 per cent respectively. **(Chart 2.1)**

Coal imports fell to their lowest value in the last 18 years, down 76 per cent (-8.5 million tonnes) on levels shown in the first quarter of 2015, as demand fell, especially for use by electricity generators. **(Charts 2.1 and 2.2)**

The demand for coal by electricity generators in the first quarter of 2016, was 50 per cent (-5.6 million tonnes) lower than demand in the first quarter of 2015 due to a fall in coal generation capacity, along with an increase in the carbon price floor (from April 2015) and the conversion of a third unit at Drax from coal to high-range co-firing (85% to <100% biomass) in July 2015 **(Chart 2.3)**

Total stock levels were down 48 per cent (-9.4 million tonnes) to 10.3 million tonnes compared to a year earlier. This was due to generators using more coal stocks for electricity generation **(Chart 2.4)**

**Chart 2.1 Coal supply**



Coal production in the first quarter of 2016 at 1.0 million tonnes (a new record low) was 69 per cent lower than the first quarter of 2015, due to mines closing and some other mines producing less coal as they are coming to the end of operation. Surface mine production fell by 55 per cent to 1.0 million tonnes (a new record low), whereas deep mine production fell by 99 per cent to 7 thousand tonnes (also a new record low), mainly due to Hatfield and Thoresby collieries closed in early July 2015 and the last large deep mine Kellingley closing in December 2015. There are just seven small deep mines remaining (See Table 2B).

Imports of coal in the first quarter of 2016 were 76 per cent lower than in the first quarter of 2015 at 2.7 million tonnes. The decrease reflects the fact that consumption by electricity generators was down. The decline was due to a fall in coal generation capacity, along with an increase in the carbon price floor (from April 2015) and the conversion of a third unit at Drax from coal to high-range co-firing (85% to <100% biomass) in July 2015.

**Table 2A Coal imports by origin**

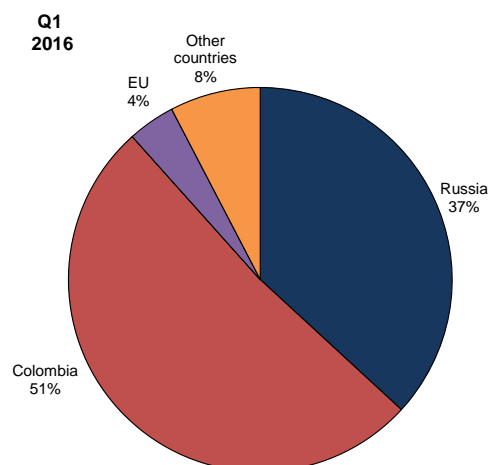
	Thousand Tonnes			
	2014	2015p	2015 Q1	2016 Q1 p
European Union	764	614	142	106
Russia	17,869	9,187	5,152	937
Colombia	9,700	7,070	2,550	1,068
USA	11,182	5,317	2,603	318
Australia	1,249	910	291	43
Other Countries	1,461	1,101	469	204
<b>Total imports</b>	<b>42,225</b>	<b>24,198</b>	<b>11,207</b>	<b>2,675</b>

Total coal imports in the first quarter of 2016 decreased by 76 per cent to 2.7 million tonnes (lowest value for at least 18 years), with 40 per cent of total coal imports coming from Colombia.

Steam coal imports in the first quarter of 2016 fell by 78 per cent to 2.1 million tonnes and accounted for 77 per cent of total coal imports.

Coking coal imports in the first quarter of 2016 fell by 63 per cent to 0.6 million tonnes and accounted for 22 per cent of total coal imports.

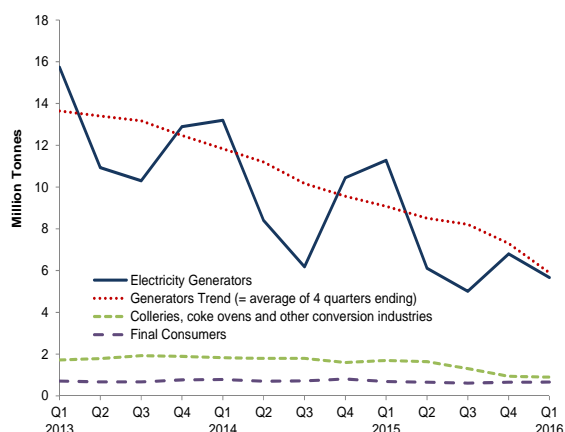
## Chart 2.2 Steam coal imports by origin



In the first quarter of 2016, 88 per cent of steam coal imports came from Colombia (51 per cent) and Russia (37 per cent). Large falls for steam coal imports were recorded from Russia (84 per cent), and Colombia (58 per cent).

USA - one of the top three suppliers of steam coal imports continuously for the last six years did not export any steam coal to the UK in the first quarter of 2016. Cheaper steam coal from other producing countries have made USA steam coal less competitive.

## Chart 2.3 Coal consumption



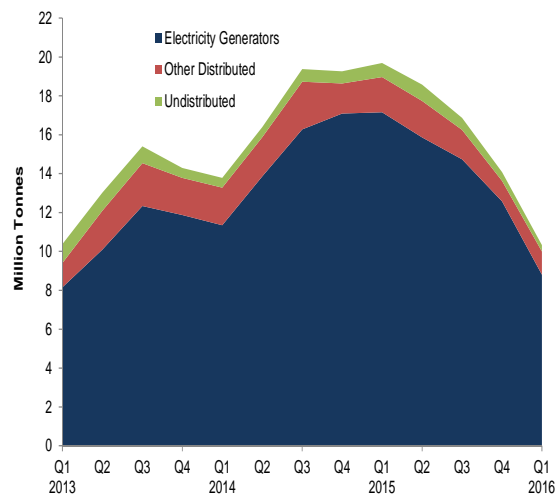
Total demand for coal in the first quarter of 2016, at 7.2 million tonnes, was 47 per cent lower than in the first quarter of 2015. Consumption by electricity generators was down by 50 per cent to 5.7 million tonnes.

Electricity generators accounted for 78 per cent of total coal use in the first quarter of 2016; compared with 83 per cent a year earlier.

Sales to industrial users fell by 4.9 per cent in the first quarter of 2016 and sales to other final consumers including domestic increased by 2.4 per cent to 0.2 million tonnes during the first quarter of 2016.

Coal used in blast furnaces was 0.3 million tonnes in the first quarter of 2016, a decrease of 25 per cent compared to the first quarter of 2015.

## Chart 2.4 Coal stocks



Coal stocks showed a seasonal fall of 3.8 million tonnes during the first quarter of 2016 and stood at 10.3 million tonnes, 9.4 million tonnes lower than at the end of March 2015. This was the lowest value for three years.

The level of coal stocks at power stations at the end of the first quarter of 2016 was 8.8 million tonnes, 8.4 million tonnes lower than at the end of March 2015, reflecting higher use of coal stocks for generation from coal.

Stocks held by coke ovens were 0.5 million tonnes at the end of the first quarter of 2016, this was 0.3 million tonnes lower than stock levels at the end of March 2015.

Stocks held by producers (undistributed stocks) at the end of the first quarter of 2016 were 0.3 million tonnes, 0.4 million tonnes lower than at the end of March 2015.

**Table 2B Remaining operating deep mines as at the end of March 2016**

<b>Name</b>
Ayle Colliery
Eckington Colliery
Hill Top Colliery
Nant Hir No.2 Colliery
Dan-y-Graig No.4 Colliery
Aberpergwm Colliery
Monument Colliery

**Table 2C Remaining operating surface mines as at the end of March 2016**

<b>Name</b>
Glan Lash
East Pit
Nant Helen
Selar
Brenkley Lane
Rusha Site
Shotton
Glenmuckloch Site
Greenburn Project
Comrie Colliery Site
Ffos-y-Fran Land Reclamation Scheme
Muir Dean Site
Netherton
Tower Colliery Surface Mining Site
Minorca
Potland Burn
Broken Cross Site
House of Water

In 2015 the last three large deep mines closed (Hatfield Colliery, Thoresby Colliery and Kellingley Colliery) and four surface mines closed (Earlseat, Laigh Glenmuir Site, Butterwell Disposal and Lodge House).

### Relevant tables

2.1: Supply and consumption of coal.....	Page 16
2.2: Supply and consumption of coke oven coke, coke breeze and other manufactured solid fuels.....	Page 17
2.3: Supply and consumption of coke oven gas, blast furnace gas, benzole and tars.....	Page 18

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## 2 SOLID FUEL AND DERIVED GASES

Table 2.1 Supply and consumption of coal

Thousand tonnes													
				2014	2014	2014	2014	2015	2015	2015	2015	2016	
	2014	2015 p	per cent change	1st quarter	2nd quarter	3rd quarter	4th quarter	1st quarter	2nd quarter	3rd quarter	4th quarter	1st quarter p	per cent change <sup>1</sup>
SUPPLY													
Indigenous production	11,648	8,598	-26.2	2,833	3,009	3,030	2,776	3,122r	2,441r	1,424r	1,612r	978	-68.7
Deep mined	3,685	2,784	-24.5	932	936	916	901	980	880	420	504r	7	-99.3
Surface mining <sup>2</sup>	7,962	5,814	-27.0	1,902	2,072	2,113	1,875	2,142r	1,561r	1,004r	1,108r	971	-54.7
Imports <sup>4</sup>	42,225	24,198	-42.7	12,653	10,631	8,826	10,114r	11,207r	4,997r	3,891r	4,103r	2,675	-76.1
Exports <sup>5</sup>	425	385	-9.3	129	79	112	105	111r	75	104	96	110	-0.1
Stock change <sup>6</sup>	-4,973r	+5,134	(-)	+525r	-2,606	-2,988r	+96r	-419r	+1,001r	+1,710r	+2,842r	+3,699	
Total supply	48,474r	37,545	-22.5	15,883r	10,955	8,755r	12,882r	13,799r	8,364r	6,921r	8,461r	7,242	-47.5
Statistical difference	+219r	+173		+72r	+63r	+59r	+25r	+141r	-34r	-5r	+71r	+20	
Total demand	48,255r	37,372	-22.6	15,811r	10,892r	8,696r	12,857r	13,658r	8,398r	6,926r	8,390r	7,222	-47.1
TRANSFORMATION													
Electricity generation	45,255	34,776	-23.2	15,028r	10,192	7,981r	12,053r	12,976r	7,747r	6,316r	7,737r	6,561	-49.4
Electricity generation	38,234	29,198	-23.6	13,199r	8,401r	6,183r	10,451r	11,278r	6,112r	5,010r	6,799r	5,667	-49.7
Heat generation <sup>7</sup>	272	213	-21.7	91r	55r	45r	80r	80r	43r	32r	58r	80	-
Coke manufacture	4,977	3,699	-25.7	1,270	1,287	1,264	1,156	1,165	1,083	880	572	443	-61.9
Blast furnaces	1,513	1,444	-4.6	411	377	416	309	423	447	330	244	316	-25.4
Patent fuel manufacture	259	223	-13.9	58	72	72	57	31	63	64	65	55	+77.2
Energy industry use	1	-	-100.0	0	0	-	-	-	-	-	-	-	
FINAL CONSUMPTION													
Iron & steel	3,000r	2,596	-13.5	782r	699r	714r	804r	682r	651r	610r	653r	661	-3.1
Iron & steel	54	45	-17.5	14	13r	14r	13	12r	12r	12r	10r	10	-9.8
Other industries	2,351r	1,968	-16.3	619r	546r	568r	618r	502r	505r	477r	483r	478	-4.8
Domestic	546	552	+1.0	138	126	119	163	159r	127r	114r	152r	159	-
Other final users	48	32	-34.7	12r	13	14r	9r	9	7r	8r	8r	13	+43.1
Stocks at end of period													
Distributed stocks	18,641r	13,629	-26.9	13,285r	15,872r	18,732r	18,641r	18,971r	17,742r	16,255r	13,629r	9,995	-47.3
Of which:													
Major power producers <sup>8</sup>	17,091	12,569	-26.5	11,350	13,858	16,275	17,091	17,158r	15,864r	14,737	12,569r	8,805	-48.7
Coke ovens	795	621	-21.9	323	473	739	795	836	955	742r	621	531	-36.5
Undistributed stocks	622r	452	-27.3	500r	519r	647r	622r	724r	839r	616r	452r	334	-53.8
Total stocks <sup>9</sup>	19,263r	14,081	-26.9	13,785r	16,391r	19,379r	19,263r	19,695r	18,581r	16,871r	14,081r	10,330	-47.6

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													
	2014	2015 p	per cent change	2014 1st quarter	2014 2nd quarter	2014 3rd quarter	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter p	per cent change <sup>3</sup>
SUPPLY													
Indigenous production	3,906	2,965	-24.1	994	1,025	990	897	895	868	727	474	376	-58.0
Coke Oven Coke	3,601	2,716	-24.6	919	940	912	830	854	800	658	404	320	-62.5
Coke Breeze	31	18	-42.0	8	8	8	7	5	5	4	5	4	-14.6
Other MSF	274	231	-15.8	67	77	70	60	36	64	65	66	51	+41.3
Imports	940	1,132	+20.5	204	202	283	251	302	290	215	325	287	-5.1
Exports	112	111r	-0.6	40	30	29	13	23	74	7r	8r	6	-74.9
Stock change <sup>1</sup>	-212r	+64r	(-)	+42	-92	-75	-87r	+73	+37r	-50r	+4r	-2	
Transfers	-5	-3		-1	-13	9	-	-2	-1	-	-	-1	
Total supply	4,518r	4,047r	-10.4	1,199	1,093	1,177	1,049	1,246	1,121r	885r	796r	654	-47.5
Statistical difference	-1	0		-0	-	-0	-0	-0	-	0	-0	-0	
Total demand	4,519r	4,047r	-10.4	1,200	1,093	1,177	1,049	1,246	1,121r	885r	796r	654	-47.5
TRANSFORMATION	3,585	3,257	-9.1	958	856	929	842	1,009	908	705	635	525	-48.0
Coke manufacture	-	-		-	-	-	-	-	-	-	-	-	
Blast furnaces	3,585	3,257	-9.1	958	856	929	842	1,009	908	705	635	525	-48.0
Energy industry use	-	-		-	-	-	-	-	-	-	-	-	
FINAL CONSUMPTION	934	790r	-15.4	242	237	248	207	237	213r	179r	161r	130	-45.3
Iron & steel	634	539	-14.9	165	161	174	134	165	151	125	98	75	-54.6
Other industries	45	17r	-62.9	11	10	10	14	10	6	-0r	-	-	-100.0
Domestic	256	235r	-8.2	66	66	64	59	62	56r	54r	63	55	-11.3
Stocks at end of period <sup>2</sup>	1,188r	1,124r	-5.4	935r	994r	1,093r	1,188r	1,115r	1,028r	1,038r	1,124r	1,126	+0.9

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									
	2014	2015 p	per cent change	2014 1st quarter	2014 2nd quarter	2014 3rd quarter	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter p	per cent change <sup>1</sup>
<b>SUPPLY</b>													
Indigenous production	25,441	22,156	-12.9	6,628	6,393	6,673	5,748	6,995	6,315	4,972	3,874	3,406	-51.3
Coke oven gas	8,473	6,890	-18.7	2,132	2,211	2,199	1,931	2,264	2,030	1,595	1,000	870	-61.6
Blast furnace gas	15,386	14,131	-8.2	4,075	3,762	4,094	3,455	4,359	3,941	3,117	2,713	2,403	-44.9
Benzole & tars	1,582	1,136	-28.2	421	420	380	361	371	344	260	161	134	-64.0
Transfers	140	420	(+)	9	25	40	66	92	96	99	132	127	+37.7
<b>Total supply</b>	25,581	22,576	-11.7	6,637	6,418	6,713	5,813	7,088	6,411	5,071	4,006	3,534	-50.1
Statistical difference	-37r	+41r		-18r	+2r	-29r	+8r	+33r	-14r	+5	+17r	-9	
<b>Total demand</b>	25,618r	22,535r	-12.0	6,655r	6,416r	6,742r	5,805r	7,054r	6,425r	5,066r	3,989r	3,543	-49.8
<b>TRANSFORMATION</b>													
Electricity generation	11,223r	9,704r	-13.5	2,918r	2,775r	2,862r	2,668r	3,192r	2,580r	2,053r	1,880r	1,804	-43.5
Heat generation <sup>2</sup>	10,626r	9,107r	-14.3	2,769r	2,626r	2,713r	2,519r	3,042r	2,430r	1,904r	1,731r	1,655	-45.6
Energy industry use	598	598	-	149	149	149	149	149	149	149	149	149	-
Losses	9,331	8,330	-10.7	2,463	2,333	2,381	2,154	2,581	2,358	1,894	1,497	1,236	-52.1
	2,517	2,646	+5.1	579	561	926	452	674	912	737	323	248	-63.2
<b>FINAL CONSUMPTION</b>													
Iron & steel	2,546r	1,855r	-27.1	695r	747r	573r	531r	608r	576r	383r	289r	255	-58.1
Other industries <sup>3</sup>	800r	719r	-10.1	242r	282r	149r	126r	237r	231r	123r	128r	121	-48.7
Non-Energy Use <sup>4</sup>	165	-	-100.0	32	45	44	44	-	-	-	-	-	
	1,582	1,136	-28.2	421	420	380	361	371	344	260	161	134	-64.0

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:

Total indigenous UK production of crude oil and NGLs (Natural Gas Liquids) in Q1 2016 was 17.3 per cent higher than a year ago. Until recently production had been in general decline but with the opening of new fields such as Golden Eagle. Production this quarter surpassed imports, for the first time since 2011. **(Chart 3.1)**

Indigenous production of petroleum products was 3.0 per cent lower in the first quarter of 2016 compared with the same quarter in 2015. Refinery production had increased during 2015 against a background of low crude prices but the long term trend is one of ongoing decline in UK refinery production **(Chart 3.2)**

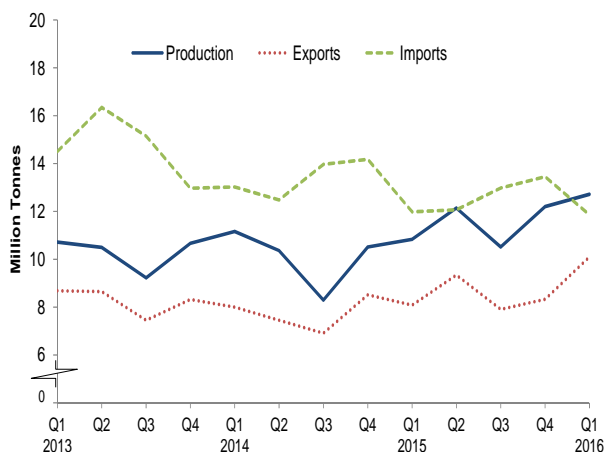
The pattern of trade showed substantial variation compared to last year. Imports of petroleum products increased by 15.6 per cent and exports increased 18.8 per cent. The UK was a net importer of petroleum products in Q1 2016 by 2.9 million tonnes. **(Chart 3.2)**

Net imports of primary oils (crude oil, NGLs and feedstocks) in Q1 2016 decreased to 1.8 million tonnes (down 55 per cent) due to higher indigenous production. Net imports met around 13 per cent of the UK's refinery demand. **(Chart 3.3)**

After many years of declining demand, Q1 2016 saw an increase of 3.9 per cent, mainly from road transport demand. Demand for key transport fuels increased by 4.3 per cent compared with Q1 2015. Motor spirit deliveries were down by just 0.6 per cent, whilst DERV (road diesel) deliveries were up by 5.6 per cent, the largest increase in recent years. **(Chart 3.5)**

Overall stocks of crude oil and petroleum products were up by 3.0 per cent at end of the Q1 2016 compared to a year earlier (by 0.4 million tonnes). **(Chart 3.7)**

**Chart 3.1 Production and trade of crude oil and NGLs**



Indigenous crude oil production was up 16.2 per cent on Q1 2015. The opening of new fields such as Golden Eagle has seen a boost to production since early 2015.

Production of Natural Gas Liquids (NGLs) increased 35.7 per cent on Q1 2015; oil extracted from new fields contains a higher proportion of NGLs.

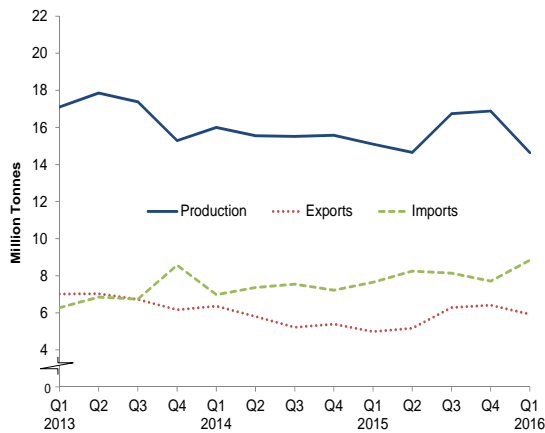
Taken together, indigenous production of crude and NGLs was 17.3 per cent higher. Production exceeded imports for the first time since Q1 2011.

Imports of crude oil and NGLs were 6.4 per cent lower compared with Q1 2015, reflecting increased use of indigenous oil by UK refineries.

Exports of crude oil and NGLs increased by 24.8 per cent in the latest three months and exports of feedstocks increased by 27.1 per cent. Refineries may be processing more crude than other feedstocks due to the recent low prices.

Overall, net imports of primary oils (crude, NGLs and feedstocks) were 1.8 million tonnes in Q1 2016, compared with 3.9 million tonnes in the same quarter of 2015.

**Chart 3.2 Production and trade of petroleum products**

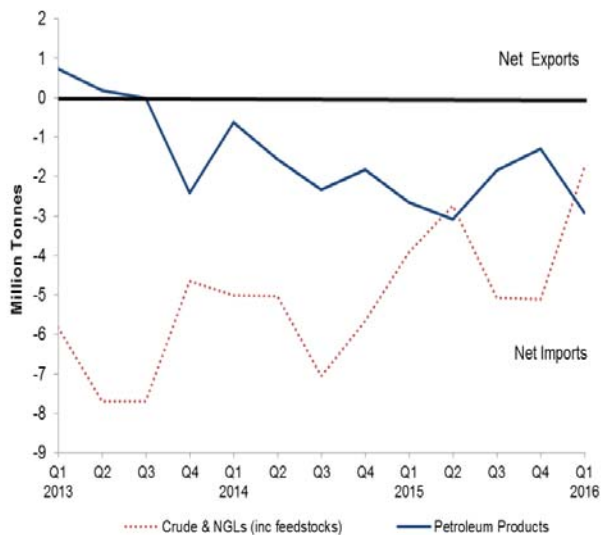


Indigenous production of petroleum products in Q1 2016 was lower by 3.0 per cent compared with the same quarter in 2015. Whilst some of this decrease is due to maintenance activity within the quarter, production is now at its lowest level since our records began in 1999.

The pattern of trade showed substantial variation compared to last year. Imports of petroleum products increased by 15.6 per cent and exports increased 18.8 per cent. This can be attributed to the product mix. The UK is more reliant on imports of products such as aviation turbine fuel and diesel; imports of these products were higher. However exports of products such as motor gasoline and petroleum gases increased in the early part of 2016.

In overall terms, the UK was a net importer (2.9 million tonnes) of petroleum products in Q1 2016.

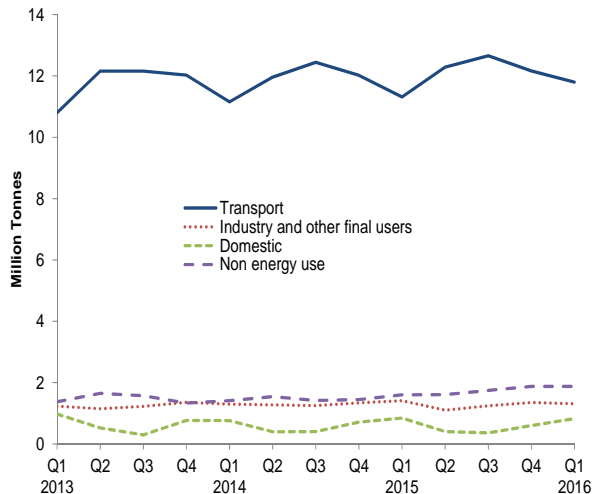
**Chart 3.3 Overall trade of crude oil and NGLs, and petroleum products**



In Q1 2016 net imports of primary oils (crude, NGLs and feedstocks) decreased to 1.8 million tonnes compared with 3.9 million tonnes in Q1 2015, a decrease of 54.8 per cent. During January and February this year the UK was briefly a net exporter of crude oil, as can be seen by the decrease in net imports in Chart 3.3. Increased indigenous production of crude oil has meant lower imports and higher exports in Q1 2016, with refineries using more indigenous oil.

The UK's overall net import dependence for primary oils (crude, NGLs and feedstocks) was about 13 per cent in Q1 2016, down from 27 per cent in Q1 2015.

In Q1 2016 the UK was a net importer of petroleum products, by 2.9 million tonnes, up from 2.7 million tonnes in the first quarter of 2015. There have now been 11 consecutive quarters where the UK has imported more petroleum products than it exported. This follows decades where the UK has been a net exporter of petroleum.

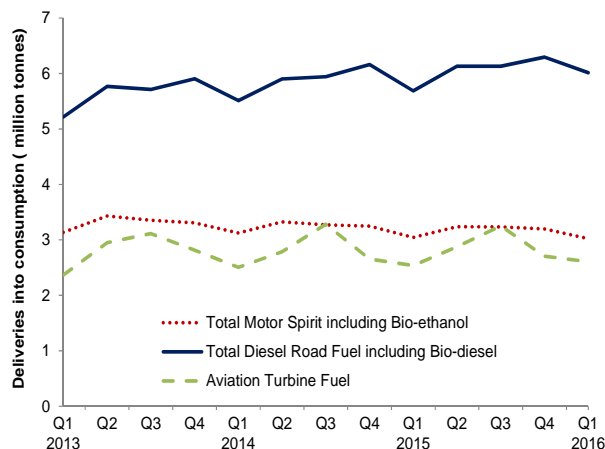
**Chart 3.4 Final consumption of oil**

Early 2016 is the fifth successive quarter that final consumption has increased after many years of declining consumption. In quarter 1 2016, final consumption of petroleum products was higher by 4.2 per cent compared with quarter 1 2015.

Transport fuels were the primary driver of this increase (see Chart 3.5). Excluding bioethanol, motor spirit (petrol) sales were down just 0.6 per cent on last year. Road diesel sales, excluding biodiesel, were up 5.6 per cent.

Transport, which accounts for about three-quarters of UK final consumption, was up by 4.3 per cent overall. (See Chart 3.5 for more detail).

The largest increase came in non-energy use, which was up by 17.4 per cent on the first quarter of 2015.

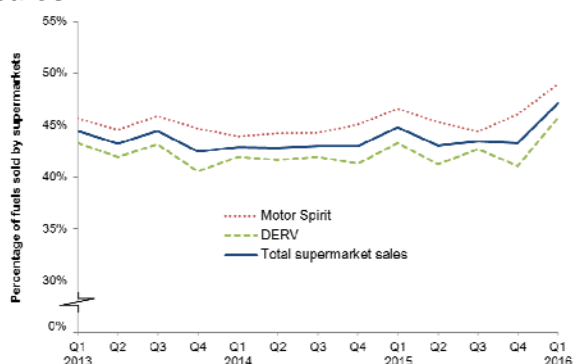
**Chart 3.5 Demand for key transport fuels**

Demand for all transport fuels increased in the early part of 2016. In Q1 2016, total deliveries of the three key transport fuels were higher by 3.3 per cent. Within this:

Motor spirit (petrol, including the bio-element) deliveries were down by just 0.7 per cent on the first quarter of 2015. This is the smallest contraction seen in recent years as we have seen more motorists switch to road diesel. DERV (road diesel, including the bio-element) demand increased by 5.8 per cent, the largest increase seen in Q1 for this product.

Demand for aviation fuels was lower than in the previous two quarters in line with seasonal patterns. There are more air passengers in the summer months. However, demand was up on the same quarter of 2015 by 2.7 per cent.

**Chart 3.6 Supermarket share of road fuel sales**

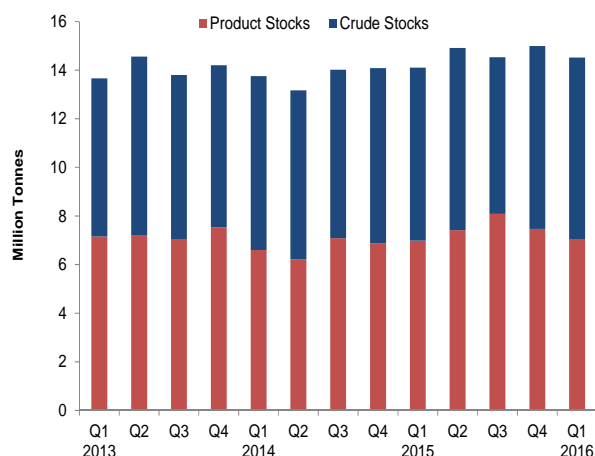


In Q1 2016 supermarkets increased their market share of road fuel sales. The overall volume of motor spirit (petrol) sales, including the bio-fuel element, decreased by just 0.7 per cent. Supermarkets sold approximately 49 per cent of that volume, up from 47 the same period last year.

Sales of diesel (again including the bio-fuel element) increased by 5.8 per cent, of which the supermarket share increased to 46 per cent from 43 per cent in Q1 2015.

On an overall basis, supermarket outlets accounted for 47 per cent of total retail sales, up from 45 per cent in the same quarter of 2015. At least some of that increase will be due to timing differences in our survey data which is likely to distort the share figure slightly upward.

**Chart 3.7 UK oil stocks**

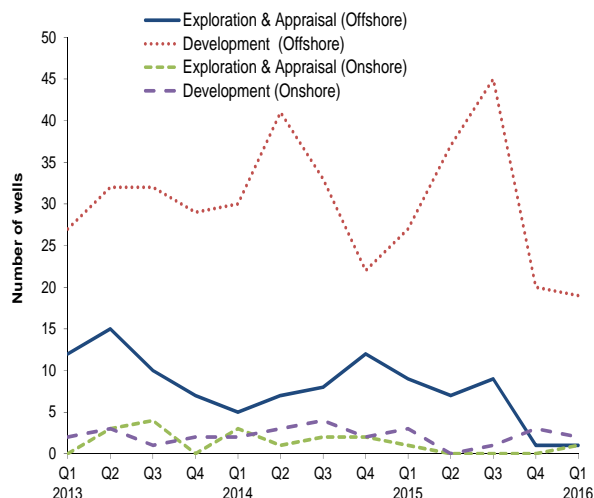


At the end of Q1 2016 total stocks of crude and products were up by 3.0 per cent compared to Q1 2015. Stocks of crude and feedstocks increased by 4.9 per cent and stocks of products increased by 1.0 per cent.

There was a large increase in stocks of crude and process oils being held at terminals, while stocks held under bilateral agreements also increased. The most notable increase in stocks of products was for other products, including petroleum coke and petroleum gases.

Product stocks held abroad for the UK under bilateral agreements were down by 11.6 per cent. Recent low prices likely mean it has been more economic for obligated companies to buy and store the product.

Chart 3.7 shows crude and product stocks held for the UK. At the end of Q1 2016, UK companies held stocks equal to around 61 days of consumption.

**Chart 3.8 Drilling activity on the UKCS**

This quarter has seen a sharp decrease in drilling activity on the UKCS recorded, and it is now at the lowest recorded level in our quarterly series.

There was 1 exploration and appraisal well started offshore in the first quarter of 2016, compared to 9 in the corresponding quarter of 2015.

There were 19 development wells drilled offshore in the first quarter of 2016, compared to 27 in the corresponding quarter of 2015.

There was 1 exploration and appraisal well started onshore in the first quarter of 2016, the same number as in the corresponding quarter of 2015.

There were 2 development wells drilled onshore in the first quarter of 2016, compared to 3 in the corresponding quarter of 2015.

## Relevant tables

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# 3 OIL AND OIL PRODUCTS

## Table 3.1 Supply and use of crude oil, natural gas liquids and feedstocks<sup>1</sup>

Thousand tonnes

	2014	2015 p	per cent change	2014 1st quarter	2014 2nd quarter	2014 3rd quarter	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter p	per cent change <sup>8</sup>
<b>SUPPLY</b>													
Indigenous production <sup>2</sup>	40,328	45,698	+13.3	11,164	10,358	8,296	10,510	10,836	12,141r	10,515r	12,206r	12,714	+17.3
Crude oil	37,474	42,826	+14.3	10,369	9,634	7,692	9,779	10,163	11,364r	9,895r	11,404r	11,810	+16.2
NGLs <sup>3</sup>	2,454	2,462	+0.3	683	644	503	623	577	689r	508r	688	783	+35.7
Feedstocks	400	410	+2.6	112	79	101	108	96	88r	112r	114	120	+25.3
Imports <sup>4</sup>	53,638	50,480	-5.9	13,018	12,481	13,964	14,174	11,985	12,068r	12,979r	13,448	11,859	-1.1
Crude oil & NGLs	48,890	45,159	-7.6	11,619	11,340	12,831	13,101	10,920	10,931r	11,406r	11,902	10,222	-6.4
Feedstocks	4,747	5,322	+12.1	1,399	1,142	1,133	1,074	1,065	1,137r	1,574r	1,547	1,637	+53.8
Exports <sup>4</sup>	30,869	33,660	+9.0	8,001	7,446	6,906	8,515	8,082	9,339r	7,908r	8,331	10,096	+24.9
Crude Oil & NGLs	29,809	31,730	+6.4	7,780	7,164	6,634	8,231	7,587	8,846r	7,279r	8,018	9,468	+24.8
Feedstocks	1,060	1,930	+82.1	221	282	273	284	494	493r	630r	313	628	+27.1
Stock change <sup>5</sup>	-592	-19	(-)	-288	63	199	-566	-59	-384r	970r	-546	-35	
Transfers <sup>6</sup>	-1,439	-1,135	-21.1	-354	-324	-306	-455	-83	-382r	-225r	-445	-501	
<b>Total supply</b>	<b>61,066</b>	<b>61,365</b>	<b>+0.5</b>	<b>15,539</b>	<b>15,132</b>	<b>15,246</b>	<b>15,149</b>	<b>14,597</b>	<b>14,104r</b>	<b>16,332r</b>	<b>16,332</b>	<b>13,940</b>	<b>-4.5</b>
Statistical difference <sup>7</sup>	+4	-10	(-)	+21	-2	-24	+8	-35	+1r	-1r	+24	-89	
<b>Total demand</b>	<b>61,063</b>	<b>61,375</b>	<b>+0.5</b>	<b>15,517</b>	<b>15,134</b>	<b>15,270</b>	<b>15,141</b>	<b>14,632</b>	<b>14,103r</b>	<b>16,332</b>	<b>16,308</b>	<b>14,029</b>	<b>-4.1</b>
<b>TRANSFORMATION</b>													
Petroleum refineries	61,063	61,375	+0.5	15,517	15,134	15,270	15,141	14,632	14,103r	16,332	16,308	14,029	-4.1

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; (+) represents a positive percentage change greater than 100%.

# 3 OIL AND OIL PRODUCTS

Table 3.2 Supply and use of petroleum products

Thousand tonnes

	2014	2015 p	per cent change	2014 1st quarter	2014 2nd quarter	2014 3rd quarter	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter p	per cent change <sup>1</sup>
<b>SUPPLY</b>													
Indigenous production <sup>2</sup>	62,647r	63,368	+1.2	15,999	15,556r	15,515r	15,577r	15,097r	14,652	16,736r	16,883r	14,645	-3.0
Imports <sup>3</sup>	29,093	31,727	+9.1	6,976	7,358	7,546	7,213	7,643	8,247r	8,134r	7,703r	8,836	+15.6
Exports <sup>3</sup>	22,748	22,835	+0.4	6,353	5,796	5,212	5,387	4,984	5,159	6,283r	6,409r	5,922	+18.8
Marine bunkers	2,824	2,426	-14.1	698	667	695	764	526	673	679r	548r	450	-14.4
Stock change <sup>4</sup>	+292	-747		+204	+227	-324	+184	-148	-229	-295r	-75r	+191	
Transfers <sup>5</sup>	-817	-1,218		-238	-272	-181	-125	-529	-249r	-257r	-184r	-193	
<b>Total supply</b>	<b>65,643r</b>	<b>67,869</b>	<b>+3.4</b>	<b>15,889</b>	<b>16,406r</b>	<b>16,649r</b>	<b>16,699r</b>	<b>16,552r</b>	<b>16,589r</b>	<b>17,357r</b>	<b>17,371r</b>	<b>17,107</b>	<b>+3.3</b>
Statistical difference <sup>6</sup>	-109r	+78		-38	+38r	-75r	-34	+128	-4r	-53r	+7r	+40	
<b>Total demand</b>	<b>65,752r</b>	<b>67,790</b>	<b>+3.1</b>	<b>15,927</b>	<b>16,368r</b>	<b>16,724r</b>	<b>16,733r</b>	<b>16,424r</b>	<b>16,593r</b>	<b>17,410r</b>	<b>17,363r</b>	<b>17,066</b>	<b>+3.9</b>
<b>TRANSFORMATION</b>													
Electricity generation	490	551	+12.4	133	117	115	124	130	126	140r	155r	153	+17.2
Heat generation	61	59	-3.7	15	15	15	15	15	15	15	15	15	+3.4
Other Transformation	504	506	+0.5	144	105	124	131	115	113	136	142	146	+26.5
<b>Energy industry use</b>													
Petroleum Refineries	3,861	4,099	+6.2	1,009	957	957	938	994	933r	1,108	1,064r	946	-4.8
Petroleum Refineries	3,198	3,400	+6.3	844	791	791	772	819	758r	933	889r	787	-3.9
Blast Furnaces	-	-		-	-	-	-	-	-	-	-	-	
Others	663	699	+5.5	166	166	166	166	175	175	175	175	158	-9.4
<b>FINAL CONSUMPTION</b>													
Iron & steel	6	6	+6.6	1	1	2	2	1	2	1	1	1	-44.9
Other industries	3,765r	3,612	-4.1	1,011	898r	875r	982r	1,028r	748r	827r	1,009r	1,006	-2.2
Transport	47,578	48,427	+1.8	11,156	11,960	12,442	12,020	11,316	12,290r	12,660r	12,161r	11,801	+4.3
Domestic	2,278	2,212	-2.9	762	398	404	715	844	405r	363r	600r	826	-2.2
Other final users	1,390r	1,490	+7.2	286	374r	374r	356r	379r	353r	415r	342r	304	-19.8
<b>Non energy use</b>	<b>5,820</b>	<b>6,830</b>	<b>+17.4</b>	<b>1,410</b>	<b>1,544</b>	<b>1,417</b>	<b>1,449</b>	<b>1,601</b>	<b>1,607r</b>	<b>1,747r</b>	<b>1,875r</b>	<b>1,879</b>	<b>+17.4</b>

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 3.3 Supply and use of petroleum products - annual data

										Thousand tonnes								
2014										2015 p								
	Total Petroleum Products	Motor spirit	DERV	Gas oil <sup>1</sup>	Aviation turbine fuel	Fuel oils	Petroleum gases <sup>2</sup>	Burning oil	Other products <sup>3</sup>	Total Petroleum Products	Motor spirit	DERV	Gas oil <sup>1</sup>	Aviation turbine fuel	Fuel oils	Petroleum gases <sup>2</sup>	Burning oil	Other products <sup>3</sup>
<b>SUPPLY</b>																		
Indigenous production <sup>a</sup>	62,647r	15,709	13,726	8,049	4,635	5,409	6,296r	2,093	6,729r	63,368	17,024	13,483	7,204	4,973	5,096	6,600	2,031	6,960
Imports <sup>5</sup>	29,093	3,482	11,452	1,406	8,157	1,024	465	619	2,489	31,727	3,805	12,605	1,838	8,186	1,033	798	860	2,602
Exports <sup>5</sup>	22,748	8,683	1,942	3,463	1,072	4,148	898	164	2,378	22,835	10,340	1,792	2,806	1,201	3,379	813	151	2,352
Marine bunkers	2,824	-	-	1,676	-	1,148	0	-	-	2,426	-	-	1,591	-	835	-	-	-
Stock change <sup>6</sup>	+292	+113	-61	+24	+123	+107	-30	-15	31	-747	-137	-94	-105	-201	-83	+14	-46	-94
Transfers <sup>7</sup>	-817	+1,610	-509	+489	-642	-616	+23	+621	-1,793	-1,218	+1,777	-422	+285	-413	-1,013	-	+397	-1,829
<b>Total supply</b>	<b>65,643r</b>	<b>12,232</b>	<b>22,666</b>	<b>4,829</b>	<b>11,201</b>	<b>627</b>	<b>5,855r</b>	<b>3,154</b>	<b>5,079r</b>	<b>67,869</b>	<b>12,129</b>	<b>23,779</b>	<b>4,824</b>	<b>11,344</b>	<b>818</b>	<b>6,600</b>	<b>3,091</b>	<b>5,287</b>
Statistical difference <sup>8</sup>	-109r	-94	-10	-0	-19	40	-24r	-26	23	79	47	68	-1	-28	3	-75	-20	86
<b>Total demand</b>	<b>65,752r</b>	<b>12,326</b>	<b>22,675</b>	<b>4,829</b>	<b>11,220</b>	<b>588</b>	<b>5,879r</b>	<b>3,179</b>	<b>5,056r</b>	<b>67,790</b>	<b>12,082</b>	<b>23,656</b>	<b>4,825</b>	<b>11,372</b>	<b>816</b>	<b>6,675</b>	<b>3,111</b>	<b>5,256</b>
<b>TRANSFORMATION</b>																		
Electricity generation	1,055	-	-	118	-	186	645	-	106	1,116	-	-	102	-	206	673	-	134
Heat generation	490	-	-	112	-	141	237	-	0	551	-	-	97	-	161	253	-	39
Petroleum refineries	61	-	-	5	-	45	11	-	-	59	-	-	5	-	45	9	-	-
Coke manufacture	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blast furnaces	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Patent fuel manufacture	91	-	-	-	-	-	-	-	91	84	-	-	-	-	-	-	-	84
Other Transformation <sup>9</sup>	413	-	-	-	-	-	398	-	15	423	-	-	-	-	-	410	-	12
Energy industry use	3,861	-	-	647	-	156	1,918	-	1,140	4,099	-	-	633	-	342	1,942	-	1,182
<b>FINAL CONSUMPTION</b>																		
Iron & steel	60,837r	12,326	22,675	4,065	11,220	246	3,316r	3,179	3,810r	62,578	12,082	23,656	4,089	11,372	268	4,061	3,111	3,939
Other industries	6	-	-	-	-	3	3	-	-	6	-	-	-	-	4	2	-	-
Transport	3,765r	-	-	1,624	-	142	346r	1,270	382r	3,612	-	-	1,647	-	158	345	1,236	-
Domestic	47,578	12,326	22,675	1,250	11,220	-	88	-	18	48,427	12,082	23,656	1,224	11,372	-	82	-	11
Other final users	2,278	-	-	138	-	-	231	1,909	-	2,212	-	-	132	-	-	205	1,875	-
Non energy use	1,390r	-	-	1,038	-	101	252r	-	-	1,490	-	-	1,070	-	107	313	-	-
	5,820	-	-	15	-	-	2,395	-	3,410	6,830	-	-	15	-	-	3,113	-	3,702

1. Includes: Middle distillate feedstock destined for use in the petrochemical industry and marine diesel c

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 product

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 Statistic

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 refer to article in Energy Trends June 2016 for more information

# 3 OIL AND OIL PRODUCTS

Table 3.4 Supply and use of petroleum products - latest quarter

Thousand tonnes

	2015 1st quarter									2016 1st quarter p								
	Total Petroleum Products	Motor spirit	DERV <sup>9</sup>	Gas oil <sup>1</sup>	Aviation turbine fuel	Fuel oils	Petroleum gases <sup>2</sup>	Burning oil	Other products <sup>3</sup>	Total Petroleum Products	Motor spirit	DERV <sup>9</sup>	Gas oil <sup>1</sup>	Aviation turbine fuel	Fuel oils	Petroleum gases <sup>2</sup>	Burning oil	Other products <sup>3</sup>
<b>SUPPLY</b>																		
Indigenous Production <sup>4</sup>	15,097r	3,985	3,032	1,779	1,136	1,301	1,595r	675	1,594	14,645	4,111	2,942	1,630	915	1,114	1,632	671	1,629
Imports <sup>5</sup>	7,643	1,194	2,965	288	1,867	262	237	350	480	8,836	946	3,507	288	2,298	199	416	320	862
Exports <sup>5</sup>	4,984	2,306	349	660	284	627	167	43	548	5,922	2,707	559	631	307	915	121	73	610
Marine bunkers	526	-	-	383	-	144	0	-	-	450	-	-	325	-	126	-	-	-
Stock change <sup>6</sup>	-148	-357	+101	+4	+29	-31	+32	+6	+66	+191	-1	+54	+163	-49	+51	-12	+26	-40
Transfers <sup>7</sup>	-529	+372	-106	+63	-206	-478	-	+213	-386	-193	+502	-57	+5	-240	-123	-	+232	-513
<b>Total supply</b>	<b>16,552r</b>	<b>2,889</b>	<b>5,643</b>	<b>1,091</b>	<b>2,542</b>	<b>283</b>	<b>1,697r</b>	<b>1,200</b>	<b>1,206</b>	<b>17,107</b>	<b>2,851</b>	<b>5,889</b>	<b>1,131</b>	<b>2,617</b>	<b>200</b>	<b>1,915</b>	<b>1,176</b>	<b>1,328</b>
Statistical difference <sup>8</sup>	+128	-4	+68	+2	+6	+31	+18	+13	-5	+40	-26	-	+11	+12	+36	+37	+1	-30
<b>Total demand</b>	<b>16,424r</b>	<b>2,893</b>	<b>5,575</b>	<b>1,089</b>	<b>2,536</b>	<b>253</b>	<b>1,679r</b>	<b>1,188</b>	<b>1,211</b>	<b>17,066</b>	<b>2,877</b>	<b>5,889</b>	<b>1,121</b>	<b>2,605</b>	<b>163</b>	<b>1,878</b>	<b>1,175</b>	<b>1,357</b>
<b>TRANSFORMATION</b>	260	-	-	28	-	51	161	-	20	314	-	-	29	-	73	183	-	29
Electricity generation	130	-	-	27	-	40	63	-	-	153	-	-	28	-	61	63	-	0
Heat generation	15	-	-	1	-	11	2	-	-	15	-	-	1	-	11	3	-	-
Petroleum refineries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Coke manufacture	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blast furnaces	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Patent fuel manufacture	16	-	-	-	-	-	0	-	16	22	-	-	-	-	-	0	-	22
Other transformation <sup>9</sup>	99	-	-	-	-	-	95	-	3	124	-	-	-	-	-	117	-	7
Energy industry use	994	-	-	158	-	91	458	-	287	946	-	-	158	-	64	434	-	289
<b>FINAL CONSUMPTION</b>	<b>15,170r</b>	<b>2,893</b>	<b>5,575</b>	<b>903</b>	<b>2,536</b>	<b>111</b>	<b>1,060r</b>	<b>1,188</b>	<b>904</b>	<b>15,807</b>	<b>2,877</b>	<b>5,889</b>	<b>933</b>	<b>2,605</b>	<b>27</b>	<b>1,261</b>	<b>1,175</b>	<b>1,039</b>
Iron & steel	1	-	-	-	-	0	1	-	-	1	-	-	-	-	0	-	-	-
Other industries	1,028r	-	-	353	-	68	97r	454	56	1,006	-	-	308	-	26	97	458	117
Transport	11,316	2,893	5,575	287	2,536	0	22	-	2	11,801	2,877	5,889	409	2,605	0	19	-	2
Domestic	844	-	-	28	-	-	82	734	-	826	-	-	26	-	-	82	718	-
Other final users	379r	-	-	231	-	42	106r	-	-	304	-	-	198	-	0	106	-	-
<b>Non energy use</b>	<b>1,601</b>	<b>-</b>	<b>-</b>	<b>3</b>	<b>-</b>	<b>-</b>	<b>752</b>	<b>-</b>	<b>846</b>	<b>1,879</b>	<b>-</b>	<b>-</b>	<b>3</b>	<b>-</b>	<b>-</b>	<b>956</b>	<b>-</b>	<b>920</b>

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 Demand for key petroleum products<sup>1</sup>

Thousand tonnes

	2014	2015p	per cent change	2014 1st quarter	2014 2nd quarter	2014 3rd quarter	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter	per cent change <sup>2</sup>
<b>MOTOR SPIRIT</b>													
of which, Hydrocarbon <sup>3</sup>	12,326	12,082	-2.0%	2,974	3,163	3,103	3,086	2,893	3,076	3,072	3,040	2,877	-0.6%
of which, Bio-ethanol <sup>4</sup>	645	631	-2.1%	152	164	168	160	150	161	163	157	146	-2.6%
<b>Total Motor Spirit including Bio-ethanol</b>	<b>12,971</b>	<b>12,713</b>	<b>-2.0%</b>	<b>3,126</b>	<b>3,327</b>	<b>3,271</b>	<b>3,247</b>	<b>3,043</b>	<b>3,237</b>	<b>3,235</b>	<b>3,197</b>	<b>3,023</b>	<b>-0.7%</b>
of which, sold through Supermarkets <sup>5</sup>	5,755	5,794	0.7%	1,373	1,471	1,448	1,464	1,418	1,467	1,435	1,473	1,480	4.3%
of which, sold through Refiners, and other traders <sup>6</sup>	7,216	6,919	-4.1%	1,753	1,856	1,823	1,783	1,625	1,770	1,800	1,724	1,543	-5.0%
of which, sold via commercial sales <sup>7</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>DIESEL ROAD FUEL</b>													
Hydrocarbon <sup>8</sup>	22,675	23,656	4.3%	5,341	5,674	5,701	5,960	5,575	5,998	5,976	6,106	5,889	5.6%
Bio-diesel <sup>9</sup>	850	595	-29.9%	174	230	243	204	111	135	158	191	127	14.4%
<b>Total Diesel Road Fuel including Bio-diesel</b>	<b>23,525</b>	<b>24,251</b>	<b>3.1%</b>	<b>5,514</b>	<b>5,903</b>	<b>5,944</b>	<b>6,164</b>	<b>5,687</b>	<b>6,133</b>	<b>6,134</b>	<b>6,298</b>	<b>6,016</b>	<b>5.8%</b>
of which, sold through Supermarkets <sup>10</sup>	6,394	6,644	3.9%	1,508	1,602	1,625	1,658	1,605	1,648	1,706	1,685	1,793	11.7%
of which, sold through Refiners, and other traders <sup>11</sup>	8,946	9,168	2.5%	2,087	2,247	2,252	2,360	2,103	2,351	2,293	2,421	2,129	1.3%
of which, sold via commercial sales <sup>12</sup>	8,185	8,439	3.1%	1,919	2,054	2,067	2,146	1,979	2,134	2,135	2,192	2,094	5.8%
<b>OTHER GAS DIESEL OIL<sup>13</sup></b>	<b>5,241</b>	<b>4,824</b>	<b>-8.0%</b>	<b>1,183</b>	<b>1,288</b>	<b>1,485</b>	<b>1,286</b>	<b>1,091</b>	<b>1,141r</b>	<b>1,417r</b>	<b>1,174r</b>	<b>1,121</b>	<b>2.7%</b>
<b>AVIATION FUELS</b>													
<b>Total sales</b>	11,238	11,383	1.3%	2,510	2,788	3,284	2,655	2,538	2,881r	3,255r	2,709r	2,607	2.7%
Aviation spirit	18	11	-36.9%	7	5	4	3	2	4r	4	2	2	0.8%
Aviation turbine fuel	11,220	11,372	1.4%	2,504	2,784	3,280	2,652	2,536	2,877r	3,252r	2,707r	2,605	2.7%
<b>FUEL OIL</b>													
<b>Total Sales</b>	579	506	-12.7%	156	144	142	137	210	117r	88r	90r	99	-52.7%
Light	225	199	-11.8%	29	74	68	54	92r	40r	31r	35r	40	-56.3%
Medium	128	117	-8.8%	32	31	31	34	46r	28r	22r	20r	26	-44.1%
Heavy	209	173	-17.5%	89	32	37	52	66r	42r	32r	33r	32	-51.6%

1. Monthly data for inland deliveries of oil products are available - See DECC 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.

6. Equals total motor spirit sales minus supermarket and commercial sales.

7. Commercial sales are estimated through returns provided by the UK's refiner:

8. Demand excluding biodiesel. Based on HMRC data

9. Biodiesel based on HMRC data and excludes other renewables.

10. Data for sales by supermarkets collected by a monthly reporting system. Includes Asda, Morrisons, Sainsburys and Tesco only.

11. Equals total diesel sales minus supermarket and commercial sales.

12. Commercial sales are estimated through returns provided by the UK's refiners

13. This includes gas diesel oil used for other purposes such as heating and middle distillate feedstock destined for use in the petrochemical industry.

### 3 OIL AND OIL PRODUCTS

Table 3.6 Stocks of petroleum<sup>1</sup> at end of period

Thousand tonnes																
		Crude oil and refinery process oil					Petroleum products					Total stocks				
		Refineries <sup>2</sup>	Terminals <sup>3</sup>	Offshore <sup>4</sup>	Net bilaterals of Crude and Process oil <sup>5</sup>	Total <sup>5</sup>	Motor Spirit <sup>6</sup>	Kerosene <sup>7</sup>	Gas/Diesel Oil <sup>8</sup>	Fuel oils	Other products <sup>9</sup>	Net bilaterals of products <sup>5</sup>	Total products	Total Net bilaterals <sup>5</sup>	Total Stocks in UK <sup>10</sup>	Total stocks
2011		3,889	694	540	151	5,274	696	1,454	1,949	525	845	2,100	7,569	2,251	10,592	12,843
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 p		3,106	1,629	499	2,289	7,524	1,084	1,425	1,859	321	755	2,022	7,466	4,312	10,678	14,990
2014	1st quarter	3,538	1,216	452	1,946	7,152	1,066	1,210	1,477	368	710	1,769	6,600	3,715	10,037	13,752
	2nd quarter	3,384	1,226	548	1,799	6,956	887	1,118	1,715	241	718	1,529	6,208	3,328	9,837	13,164
	3rd quarter	3,248	1,309	512	1,863	6,932	914	1,259	1,681	330	684	2,215	7,083	4,078	9,938	14,016
	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	640	2,051	6,982	3,922	10,176	14,098
	2nd quarter	3,590	1,565r	474r	1,862	7,491r	1,150	1,265	1,706	348	634	2,315	7,418	4,177	10,731r	14,909r
	3rd quarter	3,098	1,211r	350	1,793	6,451r	1,087	1,436	1,825	314	716	2,703	8,082	4,496	10,037r	14,533r
	4th quarter	3,106	1,629r	499r	2,289	7,524r	1,084	1,425	1,859	321	755	2,022	7,466	4,312	10,678r	14,990r
2016	1st quarter p	3,306	1,404	559	2,193	7,462	1,086	1,450	1,641	256	807	1,812	7,052	4,005	10,509	14,514
Per cent change <sup>11</sup>		-12.8	+41.7	+21.3	+17.2	+4.9	-16.7	+27.0	+5.7	-12.4	+26.1	-11.6	+1.0	+2.1	+3.3	+3.0

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 under 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 led 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.

# 3 OIL AND OIL PRODUCTS

**Table 3.7 Drilling activity<sup>1</sup> on the UKCS**

		<i>Number of wells started</i>					
		Offshore				Onshore	
		Exploration & Appraisal		Development <sup>2</sup>		Exploration & Appraisal	
		Exploration	Appraisal	Appraisal	Development <sup>2</sup>	Appraisal	Development <sup>2</sup>
2011		14	28	42	123	14	11
2012		22	31	53	122	4	13
2013		15	29	44	120	7	8
2014		14	18	32	126	8	11
2015 p		13	13	26	129	1	7
<i>Per cent change</i>		<i>-7.1</i>	<i>-27.8</i>	<i>-18.8</i>	<i>+2.4</i>	<i>-87.5</i>	<i>-36.4</i>
2014	1st quarter	3	2	5	30	3	2
	2nd quarter	4	3	7	41	1	3
	3rd quarter	3	5	8	33	2	4
	4th quarter	4	8	12	22	2	2
2015	1st quarter	2	7	9	27	1	3
	2nd quarter	5	2	7	37	-	-
	3rd quarter	6	3	9	45	-	1
	4th quarter	-	1	1	20	-	3
2016	1st quarter p	1	-	1	19	1	2
<i>Per cent change<sup>3</sup></i>		<i>-50.0</i>	<i>-100.0</i>	<i>-88.9</i>	<i>-29.6</i>	<i>-</i>	<i>-33.3</i>

1. Including sidetracked wells

2. Development wells are production or injection wells drilled after development approval has been granted.

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

## Section 4 - Gas

### Key results show:

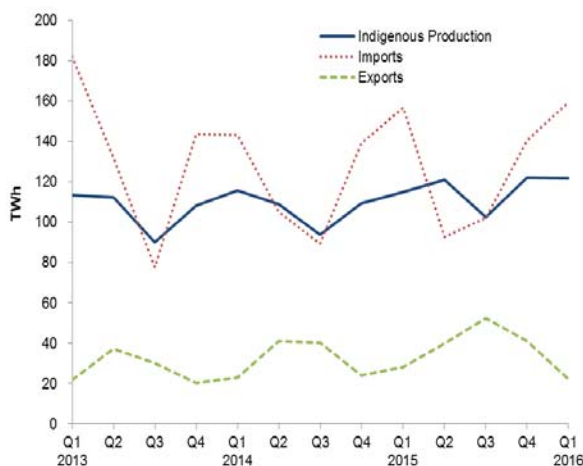
Gross UK production of natural gas in Q1 2016 was 6.0 per cent up on Q1 2015, at 122 TWh **(Chart 4.1)**. Within this, production of associated gas was 16.4 per cent higher but dry gas production was 8.3 per cent lower. **(Chart 4.2)**.

Net imports increased by 6.6 per cent in comparison to Q1 2015. **(Chart 4.4)**.

Imports were broadly flat in comparison to Q1 2015 **(Chart 4.5)**. Exports decreased by just over a fifth, driven by a 14 per cent decrease in exports to Belgium via the interconnector and a 23 per cent decrease in exports to Ireland. The latter is partially due to the the Corrib gas field in Ireland coming on line. **(Chart 4.4)**.

UK gas demand was up 5.0 per cent compared to Q1 2015, with a notable increase in demand for electricity generation, which was up 44 per cent on the same quarter last year. This is as a result of less coal generation (see section 5 for details) **(Chart 4.6)**

**Chart 4.1 Production and imports and exports of natural gas**

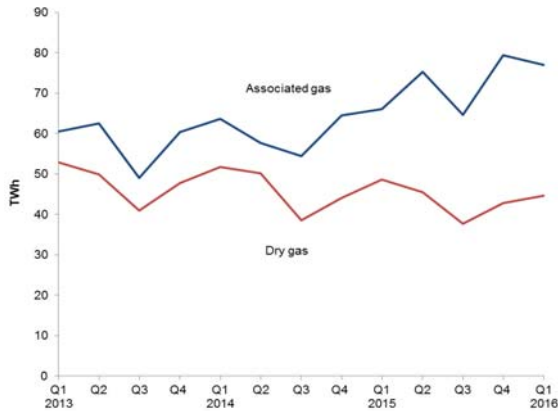


In the first quarter of 2016, gross production of natural gas was 6.0 per cent up on Q1 2015. This continues a relatively recent upward trend, in contrast to the decline since 2000.

Imports were broadly flat in comparison to Q1 2015. Whilst exports decreased by just over a fifth driven by a 14 per cent decrease in exports to Belgium via the interconnector and a 23 per cent decrease in exports to Ireland. The decrease in exports to Ireland can be attributed to the start of production from the Corrib gas field in late 2015, which is expected to account for a large proportion of annual gas demand in Ireland in its first full year of production.

## Gas

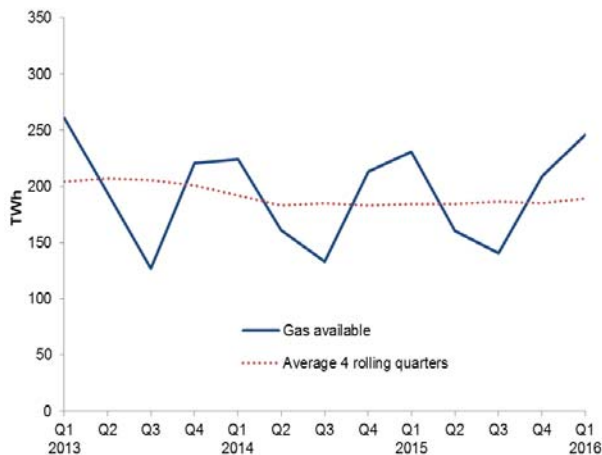
**Chart 4.2 Production of dry gas and associated gas**



In Q1 2016 associated gas production increased by 16.4 per cent versus Q1 2015.

This increase partly reflects steady production from a number of new, relatively large condensate fields in the North Sea. Dry gas production in Q1 2016 was 8.3 per cent lower than Q1 2015.

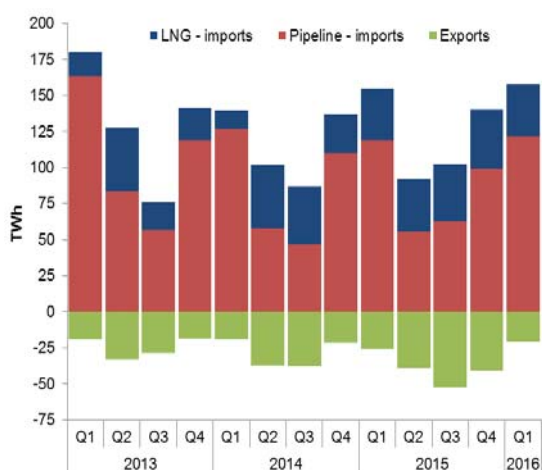
**Chart 4.3 Gas availability**



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 Q4 and Q1 each year. Gas available in Q1 2016 increased by 6.5 per cent compared to Q1 2015 to 246 TWh. This was largely driven by an increase in production.

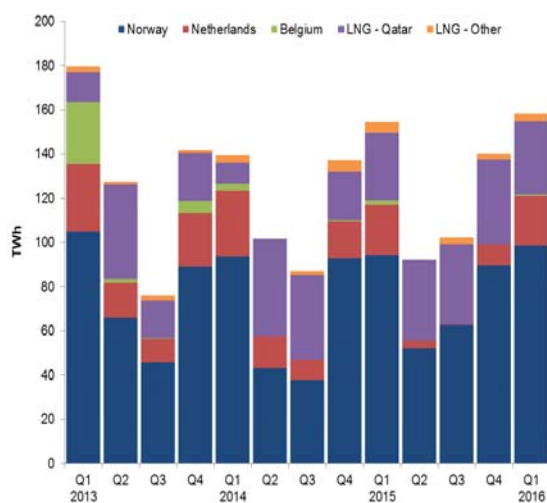
The long-term picture shows that the average availability over 4 rolling quarters had remained fairly constant since the start of 2012 before increasing slightly since the start of 2015.

**Chart 4.4 Import and exports**

Net imports increased by 6.6 per cent in comparison to Q1 2015.

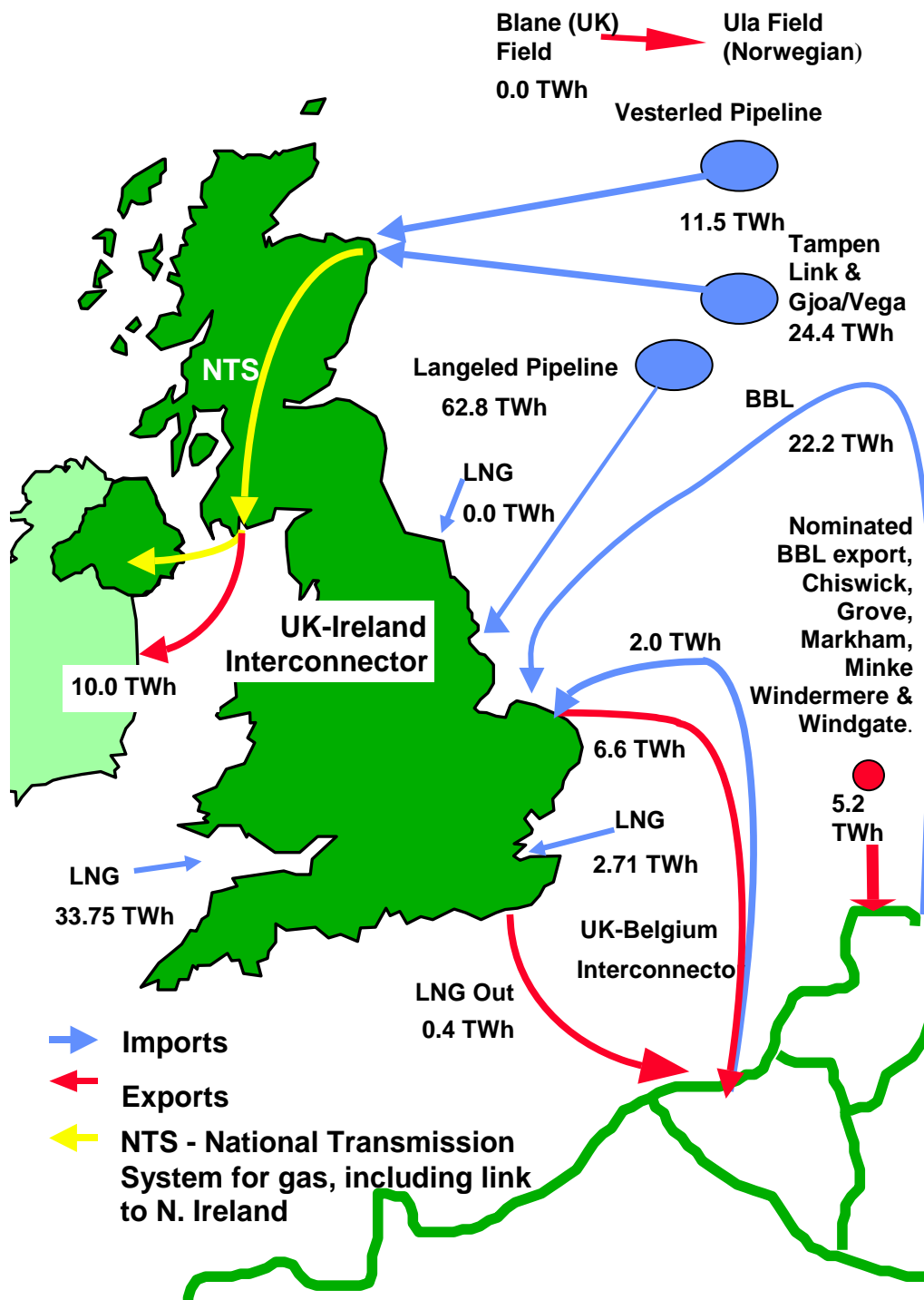
This was driven by exports decreasing by just over a fifth, with exports to Belgium via the interconnector and Ireland down 14 per cent and 23 per cent respectively. The decrease in exports to Ireland is as a result of production from the Corrib gas field in Ireland which commenced in late 2015.

In contrast to exports, imports were broadly similar in comparison to Q1 2015.

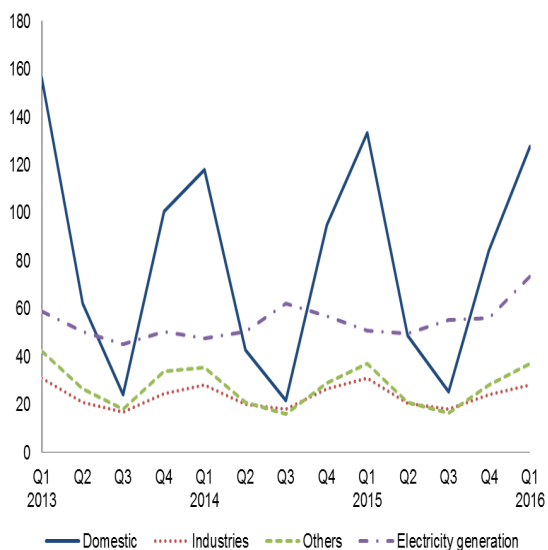
**Chart 4.5 Imports by origin**

Imports were broadly static in comparison to Q1 2015, overall and by country of origin. The bulk of imported gas 62 per cent was sourced from Norway, with a further 23 per cent sourced as LNG mainly from Qatar.

Map: UK imports and exports of gas Q1 2016<sup>1</sup>



1. 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**

Gas demand in Q1 2016 was up slightly, 5.0 per cent, in comparison to Q1 2015

It is notable that demand for electricity generation was up 44 per cent on the same quarter last year. This is as a result of less coal generation (see section 5 for details). With most other sectors showing a small decrease, domestic was down 4.1 per cent due to warmer temperatures in Q1 of 2016 compared to Q1 2015.

### Relevant table

4.1: Natural gas supply and consumption.....Page 36

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# 4 GAS

## Table 4.1. Natural gas supply and consumption

GWh

	2014	2015 p	per cent change	2014 1st quarter	2014 2nd quarter	2014 3rd quarter	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter p	per cent change <sup>1</sup>
<b>SUPPLY</b>													
Indigenous production	427,784r	460,268	+7.6	115,733r	109,085r	93,850r	109,116r	114,776	120,931	102,315	122,246r	121,619	+6.0
Imports	476,837r	492,382	+3.3	143,212	105,079r	89,405	139,141r	156,690r	92,828r	102,270r	140,594	159,307	+1.7
of which LNG	124,081	152,397	+22.8	12,911	43,973	40,151	27,046r	35,602r	36,565r	39,242r	40,988	36,459	+2.4
Exports	128,076	161,575	+26.2	22,862	41,063	40,102	24,049r	28,105r	39,789r	52,520r	41,161	22,243	-20.9
Stock change <sup>2</sup>	-2,383	+3,515		16,992	-18,072	-7,057	5,754	34,500	-11,042	-15,919	-4,024	31,688	
Transfers	-140	-420		-9	-25	-40	-66	-92	-96	-99	-132	-127	
<b>Total supply</b>	774,022r	794,170	+2.6	253,066r	155,004r	136,056r	229,896r	277,768	162,832	136,047r	217,523r	290,243	+4.5
Statistical difference	-1,269r	1,823		-31r	-320r	-496r	-422r	649r	170r	258r	746r	-807r	
<b>Total demand</b>	775,291r	792,346	+2.2	253,098r	155,324r	136,552r	230,318r	277,119r	162,661r	135,789r	216,777r	291,050r	+5.0
<b>TRANSFORMATION</b>	243,022	237,957	-2.1	55,646r	56,191r	67,012r	64,173r	59,266r	55,370r	60,259r	63,063r	81,639r	+37.7
Electricity generation	217,392	212,556	-2.2	47,710r	50,616r	62,105r	56,961r	51,144r	49,713r	55,338r	56,361r	73,517r	+43.7
Heat generation <sup>3</sup>	25,631	25,401	-0.9	7,936r	5,576r	4,906r	7,212r	8,122r	5,656r	4,921r	6,702r	8,122	-
Energy industry use	52,172r	57,580	+10.4	13,506r	13,489r	11,694r	13,482r	14,651r	15,534r	13,079r	14,315r	14,971r	+2.2
Losses	6,856	6,500	-5.2	1,959r	1,574r	1,656r	1,667r	1,438r	1,115r	1,834r	2,114r	1,145r	-20.4
<b>FINAL CONSUMPTION</b>	473,241	490,309	+3.6	181,986r	84,070r	56,190r	150,995r	201,763r	90,643r	60,618r	137,285r	193,296r	-4.2
Iron & steel	5,454	5,374	-1.5	1,480r	1,329r	1,270r	1,375r	1,589r	1,454r	1,224r	1,108r	1,190r	-25.1
Other industries	87,878	89,088	+1.4	27,007r	18,903r	16,764r	25,204r	29,532r	19,291r	17,118r	23,146r	27,021r	-8.5
Domestic	278,101	292,417	+5.1	118,101r	42,954r	21,842r	95,204r	133,307r	49,034r	25,510r	84,565r	127,905r	-4.1
Other final users	96,378	98,163	+1.9	34,041r	19,526r	14,956r	27,854r	36,019r	19,547r	15,448r	27,149r	35,863r	-0.4
Non energy use <sup>3</sup>	5,430	5,267	-3.0	1,357	1,357	1,357	1,357	1,317r	1,317r	1,317r	1,317r	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:

Electricity generated in the first quarter of 2016 fell by 3.4 per cent, from 95.8 TWh a year earlier to 92.5 TWh. **(Chart 5.1).**

Renewables' share of electricity generation increased from 22.8 per cent in the first quarter of 2015 to 25.1 per cent in the first quarter of 2016. **(Chart 5.2).**

Coal's share of generation decreased from 30.8 per cent to a record low of 15.8 per cent, whilst gas's share of generation rose from 24.7 per cent in the first quarter of 2015 to 37.8 per cent in the first quarter of 2016. **(Chart 5.2).**

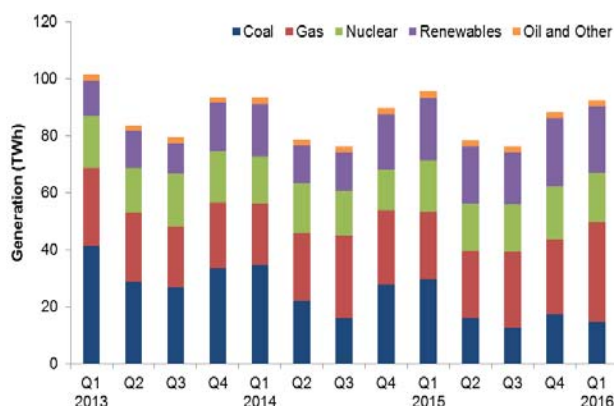
Nuclear's share of generation decreased from 19.0 per cent in the first quarter of 2015 to 18.7 per cent in the first quarter of 2016. **(Chart 5.2).**

Low carbon electricity's share of generation increased from 41.8 per cent in the first quarter of 2015 to 43.8 per cent in the first quarter of 2016. **(Chart 5.3).**

The UK remains a net importer with 6.1 per cent of electricity supplied from net imports in the first quarter of 2016. **(Chart 5.4).**

Final consumption of electricity during the first quarter of 2016, at 83.0 TWh, was provisionally 0.3 per cent lower than in the same period last year. Domestic sales fell by 1.5 per cent. **(Chart 5.5).**

**Chart 5.1 Electricity generated by fuel type**



In 2016 Q1, total electricity generated fell 3.4 per cent from 95.8 TWh in 2015 Q1 to 92.5 TWh.

In 2016 Q1, coal fired generation fell by 50 per cent from 29.5 TWh to a record Q1 low of 14.6 TWh due to decreased capacity and a market preference for gas generation.

In 2016 Q1, gas fired generation increased 48 per cent from 23.7 TWh to 35.0 TWh.

In 2016 Q1, nuclear generation fell 4.6 per cent from 18.2 TWh to 17.3 TWh after the closure of Wylfa at the end of December 2015.

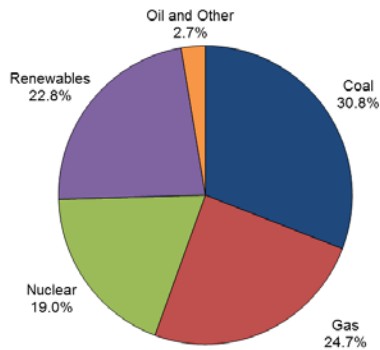
In 2016 Q1, wind and PV generation rose 0.8 per cent from 12.8 TWh to 12.9 TWh due to increased wind and solar capacity, which was slightly offset by a fall in average wind speeds of 0.9 knots<sup>1</sup>. Hydro generation remained broadly unchanged at 2.0 TWh.

<sup>1</sup> Weather data comes from tables ET 7.2 at [www.gov.uk/government/statistics/energy-trends-section-7-weather](http://www.gov.uk/government/statistics/energy-trends-section-7-weather)

## Electricity

**Chart 5.2 Shares of electricity generation**

Q1 2015



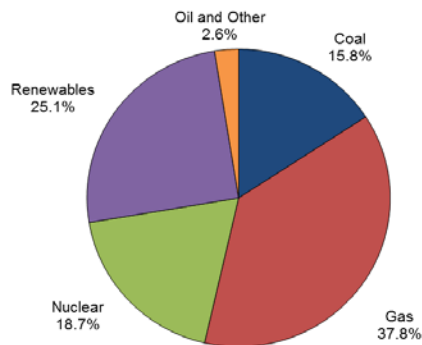
The share of generation from coal decreased from 30.8 per cent in 2015 Q1 to a record low 15.8 per cent in 2016 Q1.

Gas's share of generation increased from 24.7 per cent in 2015 Q1 to 37.8 per cent in 2016 Q1.

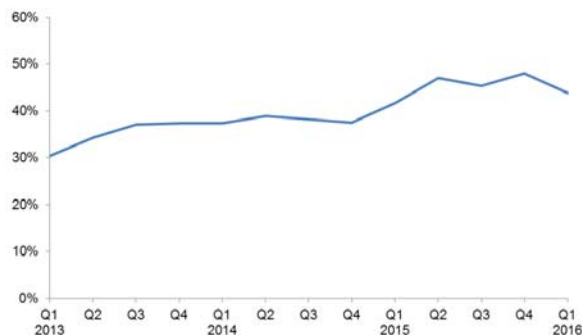
Nuclear's share of generation fell from 19.0 per cent in 2015 Q1 to 18.7 per cent in 2016 Q1.

The share of renewables (hydro, wind and other renewables) increased from 22.8 per cent in 2015 Q1 to 25.1 per cent in 2016 Q1. This was mostly due to increased bioenergy generation capacity, including the conversion of a third unit at Drax from coal to a high-range co-firing (85% to <100% biomass) unit in July 2015.

Q1 2016

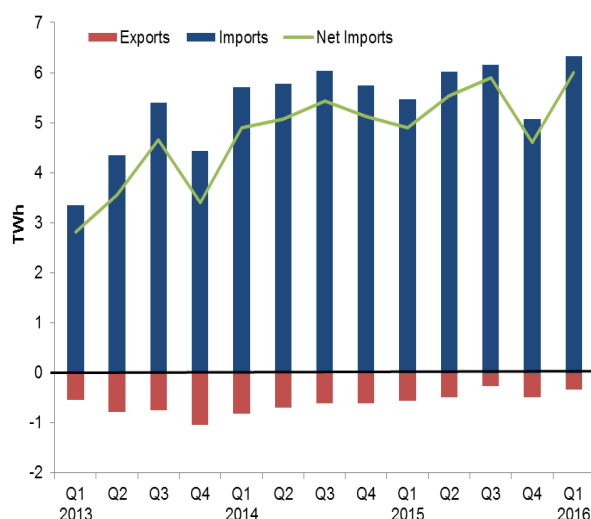


**Chart 5.3 Low carbon electricity's share of generation**



Low carbon electricity's share of generation increased from 41.8 per cent in 2015 Q1 to 43.8 per cent in 2016 Q1, despite a fall in nuclear generation, due to higher renewables generation. This was mostly due to increased bioenergy capacity including the conversion of a third unit at Drax from coal to a high-range co-firing (85% to <100% biomass) unit in July 2015.

Chart 5.4 UK trade in electricity



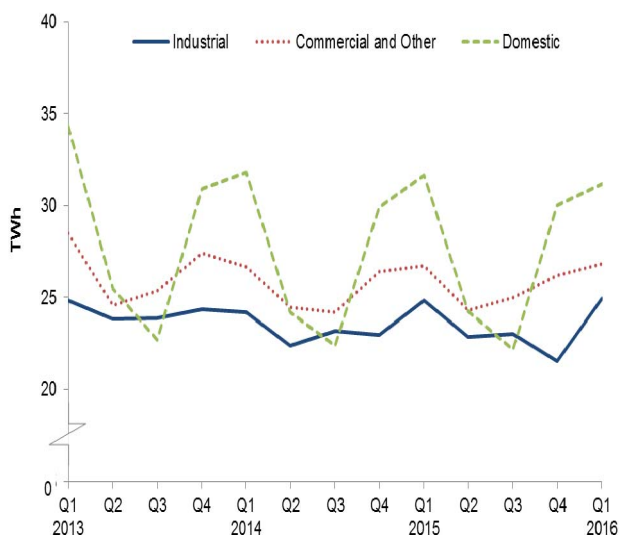
In 2016 Q1, compared with the same period in 2015, imports of electricity rose by 16.0 per cent (+0.9 TWh) to a record high 6.0 TWh, whilst exports fell by 40 per cent (-0.2 TWh).

The UK was a net exporter of electricity in the two consecutive quarters of 2009 Q4 and 2010 Q1 but has since become and remained a net importer of electricity.

Net imports of electricity, at a record high 6.0 TWh in 2016 Q1, were 22 per cent higher than the level of 4.9 TWh in 2015 Q1 as a result of increase in continental imports and a decrease in exports. Net imports represented 6.1 per cent of electricity supplied in 2016 Q1.

In 2016 Q1, the UK was a net importer with net imports of 3.9 TWh from France and 2.1 TWh from The Netherlands.

Chart 5.5 Electricity final consumption



Final consumption of electricity fell slightly by 0.3 per cent in 2016 Q1, from 83.3 TWh in 2015 Q1, to 83.0 TWh.

Domestic consumption fell by 1.5 per cent, from 31.7 TWh in 2015 Q1 to 31.2 TWh in 2016 Q1.

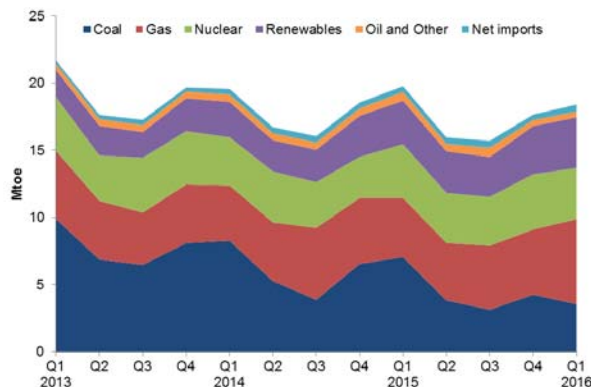
In 2016 Q1 industrial use of electricity at 24.9 TWh was 0.3 per cent higher and consumption by commercial and other users<sup>2</sup> at 26.9 TWh was 0.4 per cent higher than the same period in 2015.

In 2016 Q1, temperatures were on average 0.5 degrees higher than in 2015 Q1.<sup>3</sup>

<sup>2</sup> Includes commercial, transport and other final users.

<sup>3</sup> Temperature data comes from table ET 7.1, at: [www.gov.uk/government/statistics/energy-trends-section-7-weather](http://www.gov.uk/government/statistics/energy-trends-section-7-weather)

**Chart 5.6 Fuel used for electricity generation**



Fuel used by generators in 2016 Q1 fell 6.8 per cent, from 19.8 mtoe in 2015 Q1 to 18.5 mtoe in 2016 Q1.<sup>4</sup>

In 2016 Q1, gas use was 44 per cent higher than in 2015 Q1. Coal use during the quarter was 50 per cent lower than a year earlier, while nuclear sources were 4.6 per cent lower.

<sup>4</sup> 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.

## Relevant tables

5.1: Fuel used in electricity generation and electricity supplied .....	Page 41
5.2: Supply and consumption of electricity.....	Page 42

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# 5 ELECTRICITY

Table 5.1. Fuel used in electricity generation and electricity supplied

	2014	2015 p	per cent change	2014 1st quarter	2014 2nd quarter	2014 3rd quarter	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter p	per cent change <sup>1</sup>
<b>FUEL USED IN GENERATION</b>													
<b>All generating companies</b>													
										Million tonnes of oil equivalent			
Coal	23.97	18.26	-23.8	8.27	5.27	3.88	6.55	7.05	3.82	3.13	4.25	3.54	-49.8
Oil	0.55	0.62	+11.9	0.14	0.16	0.13	0.12	0.16	0.12	0.18	0.16	0.16	+2.9
Gas	18.73	18.31	-2.2	4.11	4.36	5.35	4.91	4.41	4.28r	4.77r	4.86r	6.33	+43.7
Nuclear	13.85	15.48	+11.8	3.59	3.80	3.40	3.05	4.00	3.72	3.64	4.11	3.82	-4.6
Hydro	0.51	0.54	+6.7	0.19	0.10	0.07	0.15	0.17	0.12r	0.09r	0.16	0.18	+1.8
Wind and Solar <sup>2</sup>	3.10	4.12	+32.9	0.99	0.56	0.58	0.97	1.10	0.99	0.85r	1.17	1.11	+0.7
Bioenergy <sup>3</sup>	6.82	8.46	+24.2	1.45	1.66	1.77	1.94	2.01	2.03	2.09r	2.33r	2.54	+26.4
Other fuels	1.63	1.75	+7.4	0.41	0.37	0.42	0.43	0.50	0.44	0.52	0.29r	0.27	-45.6
Net imports	1.76	1.80	+2.0	0.42	0.44	0.47	0.44	0.42	0.48	0.51	0.40	0.52	+22.3
<b>Total all generating companies</b>	<b>70.91</b>	<b>69.33</b>	<b>-2.2</b>	<b>19.58</b>	<b>16.72</b>	<b>16.05</b>	<b>18.56</b>	<b>19.82</b>	<b>16.00r</b>	<b>15.78r</b>	<b>17.73r</b>	<b>18.46</b>	<b>-6.8</b>
<b>ELECTRICITY GENERATED</b>													
<b>All generating companies</b>													
												<b>TWh</b>	
Coal	100.23	75.63	-24.5	34.56	22.10	15.89	27.69	29.54	15.92r	12.77r	17.40r	14.64	-50.4
Oil	1.90	2.13	+12.5	0.54	0.50	0.44	0.41	0.62	0.43	0.58	0.50	0.44	-29.0
Gas	100.89	100.03	-0.9	21.75	23.77	29.15	26.23	23.70	23.47r	26.58r	26.29r	34.96	+47.5
Nuclear	63.75	70.34	+10.3	16.53	17.50	15.66	14.06	18.17	16.92	16.56	18.69	17.34	-4.6
Hydro (natural flow)	5.89	6.29	+6.7	2.24	1.11	0.78	1.75	2.01	1.43r	1.03r	1.82r	2.05	+1.8
Wind and Solar <sup>2</sup>	36.01	47.87	+33.0	11.52	6.56	6.70	11.22	12.81	11.48r	9.93r	13.66r	12.91	+0.8
- of which, Offshore <sup>6</sup>	13.40	17.42	+30.0	4.38	2.09	2.24	4.69	4.68	3.58r	3.41	5.76r	5.14	+10.0
Bioenergy <sup>3</sup>	22.68	29.39	+29.6	4.59	5.47	5.94	6.69	7.00	7.06r	7.10r	8.24r	8.26	+18.0
Pumped Storage	2.88	2.74	-5.0	0.79	0.67	0.63	0.79	0.72	0.65r	0.65	0.71	0.76	+5.7
Other fuels	3.94	4.66	+18.4	0.99	0.95	0.99	1.01	1.20r	1.16r	1.18r	1.12	1.16	-3.6
<b>Total all generating companies</b>	<b>338.17</b>	<b>339.10</b>	<b>+0.3</b>	<b>93.50</b>	<b>78.65</b>	<b>76.17</b>	<b>89.85</b>	<b>95.78</b>	<b>78.52r</b>	<b>76.37r</b>	<b>88.43r</b>	<b>92.52</b>	<b>-3.4</b>
<b>ELECTRICITY SUPPLIED<sup>4</sup></b>													
<b>All generating companies</b>													
												<b>TWh</b>	
Coal	95.07	71.75	-24.5	32.78	20.96	15.07	26.26	28.03	15.11r	12.11r	16.50r	13.89	-50.4
Oil	1.72	1.94	+12.5	0.49	0.46	0.40	0.37	0.57	0.39	0.53	0.45	0.40	-30.2
Gas	99.00	98.16	-0.9	21.32	23.33	28.62	25.74	23.26	23.01	26.08	25.81r	34.40	+47.9
Nuclear	57.90	63.89	+10.3	15.01	15.90	14.22	12.77	16.51	15.37	15.04	16.98	15.75	-4.6
Hydro	5.84	6.24	+6.9	2.22	1.10	0.77	1.74	2.00	1.41r	1.02r	1.81r	2.03	+1.8
Wind and Solar <sup>2</sup>	36.01	47.87	+32.9	11.52	6.56	6.70	11.22	12.81	11.48r	9.93r	13.66r	12.91	+0.8
- of which, Offshore <sup>6</sup>	13.40	17.42	+30.0	4.38	2.09	2.24	4.69	4.68	3.58r	3.41	5.76r	5.14	+10.0
Bioenergy <sup>3</sup>	19.59	25.53	+30.3	3.93	4.72	5.14	5.80	6.07	6.12r	6.16r	7.17r	7.19	+18.4
Pumped Storage (net supply) <sup>5</sup>	-1.01	-0.98	-3.0	-0.26	-0.25	-0.24	-0.26	-0.25	-0.23r	-0.25	-0.25r	-0.27	+6.9
Other fuels	3.68	4.32	+17.3	0.93	0.89	0.92	0.94	1.11	1.07r	1.09r	1.04r	1.07	-3.9
Net imports	20.52	20.94	+2.0	4.89	5.08	5.43	5.12	4.91	5.54	5.89	4.60	6.00	+22.3
<b>Total all generating companies</b>	<b>338.33</b>	<b>339.65</b>	<b>+0.4</b>	<b>92.82</b>	<b>78.75</b>	<b>77.04</b>	<b>89.71</b>	<b>95.00</b>	<b>79.28r</b>	<b>77.60r</b>	<b>87.77r</b>	<b>93.37</b>	<b>-1.7</b>

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

	2014	2015 p	Per cent change	2014 1st quarter	2014 2nd quarter	2014 3rd quarter	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter p	Per cent change <sup>1</sup>
<b>SUPPLY</b>													
Indigenous production	338,175r	339,095r	+0.3	93,503r	78,649r	76,171r	89,851r	95,782r	78,518r	76,371r	88,425r	92,522	-3.4
Major power producers <sup>2 3</sup>	297,939	293,003r	-1.7	83,205	68,844	66,368	79,522	84,255r	66,555r	64,840r	77,353r	80,427	-4.5
Auto producers	37,352r	43,353r	+16.1	9,508r	9,134r	9,175r	9,535r	10,805r	11,313r	10,878r	10,358r	11,332	+4.9
Other sources <sup>4</sup>	2,883	2,739r	-5.0	791	671	628	793	723r	650r	653r	714r	764	+5.7
Imports	23,243	22,716	-2.3	5,700	5,770	6,036	5,737	5,462	6,023	6,152	5,080	6,334	+16.0
Exports	2,723	1,778	-34.7	808	694	604	618	555	484	259	480	331	-40.4
Transfers	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total supply</b>	358,694r	360,034r	+0.4	98,396r	83,725r	81,604r	94,970r	100,689r	84,056r	82,263r	93,025r	98,526	-2.1
Statistical difference	-1,210r	1,671r	-	-247r	-477r	-334r	-153r	504r	419r	284r	464r	-140	-
<b>Total demand</b>	359,905r	358,363r	-0.4	98,642r	84,201r	81,938r	95,123r	100,186r	83,637r	81,979r	92,560r	98,665	-1.5
<b>TRANSFORMATION</b>													
Energy industry use <sup>5</sup>	28,387	28,160	-0.8	7,634r	6,972r	6,503r	7,278r	7,603r	6,677r	6,662r	7,218r	7,092r	-6.7
Losses	28,651	27,458	-4.2	8,340r	6,168r	5,621r	8,521r	9,307r	5,525r	5,088r	7,538r	8,582r	-7.8
<b>FINAL CONSUMPTION</b>													
Iron & steel	3,787r	3,688r	-2.6	956	945	937	949	990r	935r	887r	875r	868	-12.3
Other industries	88,978r	88,659r	-0.4	23,252r	21,447r	22,251r	22,027r	23,872r	21,951r	22,143r	20,693r	24,076	+0.9
Transport	4,504r	4,476r	-0.6	1,126r	1,126r	1,126r	1,126r	1,119r	1,119r	1,119r	1,119r	1,119	-
Domestic	108,324r	108,157r	-0.2	31,796r	24,192r	22,407r	29,929r	31,657r	24,257r	22,214r	30,029r	31,191	-1.5
Other final users	97,274r	97,765r	+0.5	25,538r	23,350r	23,093r	25,293r	25,637r	23,173r	23,866r	25,089r	25,737	+0.4
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., Cubico 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

## Section 6 – Renewables

### Key results show:

Renewables' share of electricity generation was 25.1 per cent in 2016 Q1, up 2.3 percentage points on the share in 2015 Q1, mostly reflecting increased capacity. Wind speeds and rainfall were lower than last year. **(Chart 6.1)**

Renewable electricity generation was 23.2 TWh in 2016 Q1, an increase of 6.4 per cent on the 21.8 TWh in 2015 Q1. **(Chart 6.2)**

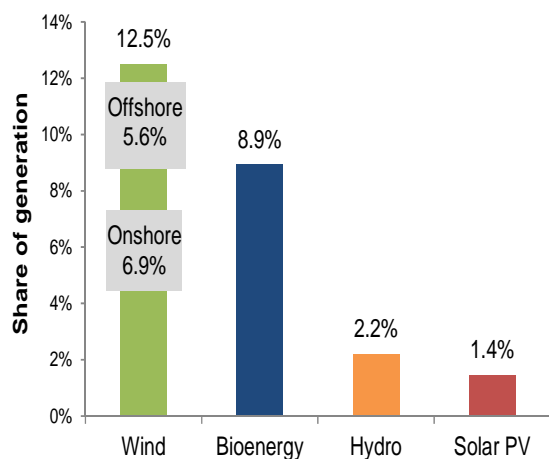
Plant biomass increased by 1.2 TWh (29 per cent) to 5.6 TWh in 2016 Q1, the highest increase in absolute terms across the technologies. Solar photovoltaic showed the highest increase in percentage terms (41 per cent) from 1.0 TWh in 2015 Q1 to 1.3 TWh in 2016 Q1 due to increased capacity. Total wind generation decreased by 2.5 per cent to 11.6 TWh; an increase in capacity was more than offset by lower wind speeds **(Chart 6.2)**.

Renewable electricity capacity was 31.2 GW at the end of 2016 Q1, a 11.8 per cent increase (3.3 GW) on a year earlier, and a 2.4 per cent increase (0.7 GW) on the previous quarter. Of the 0.7 GW increase in 2016 Q1, over half was due to new, mainly large-scale, solar photovoltaic capacity. **(Chart 6.3)**

In 2016 Q1, 0.1 GW of installed capacity was confirmed on the Feed in Tariff scheme, increasing the total to 5.0 GW, across 833,785 installations. **(Chart 6.5)**

Liquid biofuels consumption increased by 4.1 per cent, from 314 million litres in 2015 Q1 to 327 million litres in 2016 Q1. This represented 2.9 per cent of petrol and diesel consumed in road transport. **(Chart 6.6)**

**Chart 6.1 Renewables' share of electricity generation**



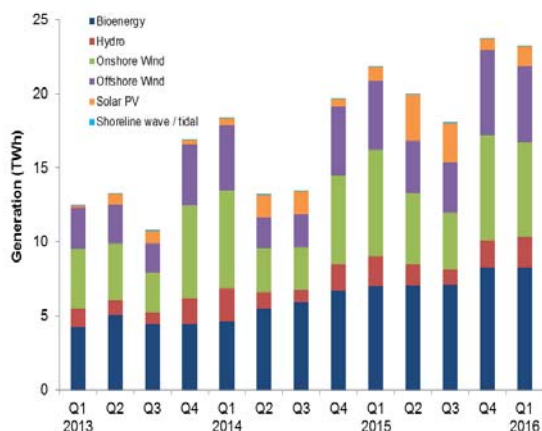
Renewables' share of electricity generation increased from 22.8 per cent in 2015 Q1 to 25.1 per cent in 2016 Q1, but fell by 1.5 percentage points on 2015 Q4's 26.8 per cent.<sup>1</sup>

The increase on a year earlier reflects increased capacity, particularly in solar PV and onshore and offshore wind. Average wind speeds and rainfall were both lower than last year.

Total electricity generated from renewables in 2016 Q1 was up by 6.4 per cent on 2015 Q1, from 21.8 TWh to a new record of 23.2 TWh.

Overall electricity generation was 92.5 TWh in 2016 Q1, down 3.4 per cent on a year earlier (95.8 TWh). This decrease in overall generation increased renewables' share of electricity generation by 0.9 percentage points.

<sup>1</sup> 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](http://www.gov.uk/government/statistics/electricity-section-5-energy-trends)

**Chart 6.2 Renewable electricity generation**

*To note that the solar PV (and onshore wind) figures not only include installations confirmed on the FiTs scheme, but also a large number of sub 50 kW installations commissioned, and registered on the Microgeneration Certification Scheme, that are awaiting confirmation on FiTs (as well as any capacity not supported by FiTs).*

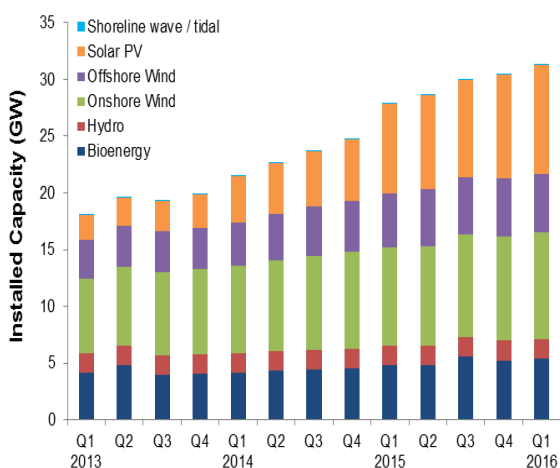
In 2016 Q1, generation from bioenergy<sup>2</sup> increased by 18 per cent on a year earlier, from 7.0 TWh to 8.3 TWh, the majority of which was from plant biomass. This was mainly due to the third unite at Drax Power Station being converted to high-range co-firing (85 per cent to 100 per cent biomass).

Electricity generated from onshore wind decreased by 11 per cent in 2016 Q1, from 7.2 TWh in 2015 Q1 to 6.4 TWh, though generation from offshore wind actually increased by 10 per cent to 5.1 TWh. The higher increase in capacity for onshore wind (in absolute terms) compared to offshore wind, was sufficient to offset the lower wind speeds during the quarter. Wind speeds were in line with the long term mean at 9.7 knots, wind speeds were higher in 2015 Q1 at 10.7 knots.<sup>3</sup>

Generation from solar photovoltaics increased by 41 per cent (0.4 TWh) to 1.3 TWh compared to 2015 Q1. This was largely due to increased capacity. Compared to 2015 Q4, generation was 0.5 TWh (69 per cent) higher.

Hydro generation increased slightly by 1.8 per cent on a year earlier to 2.0 TWh; although average rainfall (in the main hydro catchment areas) decreased during the quarter, this followed the wettest December in four years.

Bioenergy had the largest share of generation (36 per cent) with, 28 per cent from onshore wind, 22 per cent from offshore wind, 8.8 per cent from hydro and 5.8 per cent from solar PV.

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

At the end of 2016 Q1, the UK's renewable electricity capacity totalled 31.2 GW, an increase of 12 per cent (3.3 GW) on that installed at the end of 2015 Q1, and 2.4 per cent (0.7 GW) higher than the previous quarter.

Of the 0.7 GW increase during 2016 Q1, more than half came from solar photovoltaics, mostly large scale (>5 MW) schemes. Compared to 2015 Q1, solar photovoltaic capacity increased by 1.7 GW (21 per cent) to 9.6 GW.

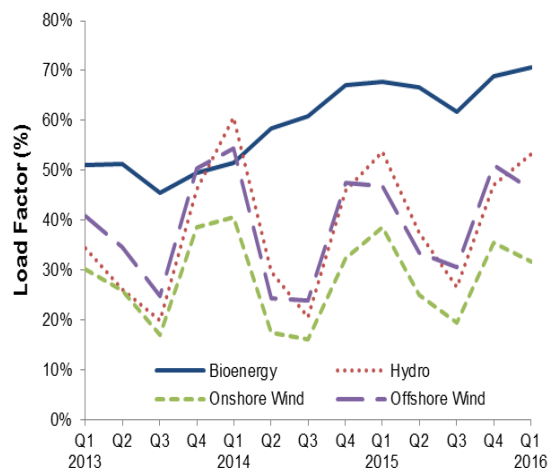
Onshore wind capacity increased by 0.7 GW (7.6 per cent) compared to 2015 Q1, and offshore wind by 0.4 GW (7.5 per cent). Several new onshore wind farms opened, including the 60 MW Moy in 2016 Q1. The increase in offshore capacity was largely due to the completion of Westernmost Rough, Gwynt-y-Mor and Humber Gateway, there was no increase in 2016 Q1.

For the first quarter, solar photovoltaic's share of renewable capacity has now taken over from onshore wind with a 30.7 per cent and 30.2 per cent share respectively.

<sup>2</sup> Bioenergy consists of: landfill gas, sewage gas, energy from waste, plant biomass, animal biomass, anaerobic digestion and co-firing (generation only)

<sup>3</sup> Statistics on weather (temperature, wind speeds, rainfall and sun levels) can be found in tables ET 7.1 – 7.4, at: [www.gov.uk/government/statistics/energy-trends-section-7-weather](http://www.gov.uk/government/statistics/energy-trends-section-7-weather)

**Chart 6.4 Renewable electricity load factors**

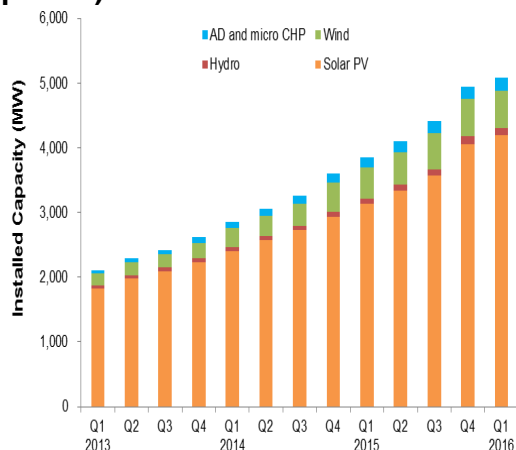


In 2016 Q1, onshore wind's load factor fell by 6.9 percentage points, from 38.6 per cent in 2015 Q1 to 31.7 per cent due to lower onshore wind speeds. In comparison, offshore wind's load factor fell by just 0.7 percentage points, from 46.8 per cent in 2015 Q1 to 46.1 per cent in 2016 Q1.<sup>4</sup>

Hydro's load factor in 2016 Q1 fell by 0.5 percentage points, from 53.7 per cent in 2015 Q1 to 53.3 per cent, with average rainfall down by 14 per cent (though this followed high rainfall in the preceding December). Compared with 2015 Q4, hydro's load factor in 2016 Q1 rose by 6.2 percentage points, from 47.1 per cent, though average rainfall fell by 28 per cent.

For bioenergy, the load factor in 2016 Q1, was 70.6 per cent, a record. This was up by 3.0 percentage points on a year earlier and 1.8 percentage points on the previous quarter. This reflects the conversion of a third unit at Drax Power Station to high-range co-firing (85 per cent to 100 per cent biomass).

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



At the end of 2016 Q1, 4,971 MW of capacity was eligible for the GB Feed in Tariff (FiTs) scheme. This was a 2.5 per cent increase on the 4,848 MW confirmed on the scheme at the end of 2015 Q4, and 29 per cent more than the amount confirmed at the end of 2015 Q1.<sup>5</sup>

In terms of number of installations, at the end of 2016 Q1, there were 862,074 eligible for the FiT scheme, a 3.4 per cent increase on the 833,785 confirmed at the end of the previous quarter, and 26 per cent higher than the 683,780 schemes confirmed at the end of 2015 Q1.

Solar photovoltaics (PVs) represent the majority of both installations and installed capacity confirmed on FiTs, with, respectively, 99 per cent and 82 per cent of the total. The majority of PV installations are sub-4 kW retrofitted schemes, which increased by 26,080 (71 MW) from 2015 Q4 to bring the total to 806,491 (2,355 MW) at the end of 2016 Q1.<sup>6</sup>

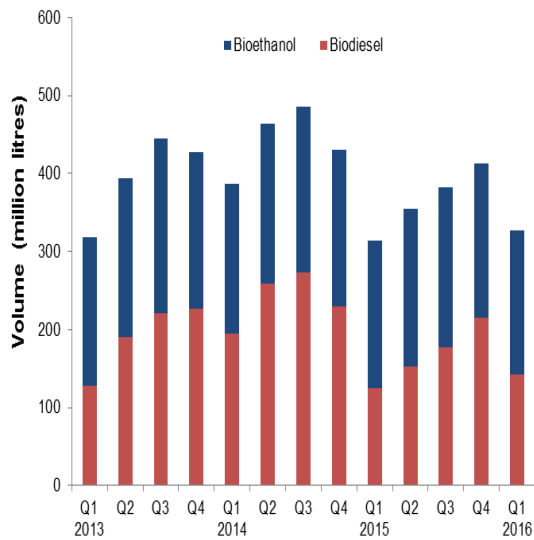
Renewable installations confirmed on FiTs (all except MicroCHP) represented 16 per cent of all renewable installed capacity.

<sup>4</sup> 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. This may particularly be the case for large wind farms, such as London Array offshore, that come online incrementally throughout the quarter.

<sup>5</sup> Statistics on Feed in Tariff can be found at: [www.gov.uk/government/collections/feed-in-tariff-statistics](http://www.gov.uk/government/collections/feed-in-tariff-statistics)

<sup>6</sup> To note that Feed in Tariff uptake statistics are based on the *confirmation* date, which can be several months later than the commissioning (installation) date. Hence the amount of capacity installed in a quarter may differ substantially from that confirmed on the FiTs scheme in the same quarter.

**Chart 6.6 Liquid biofuels for transport consumption**



In 2016 Q1, 327 million litres of liquid biofuels were consumed in transport, an increase of 4.1 per cent on the total in 2015 Q1 (314 million litres). However, 2015 Q1 had been the lowest level since 2012 Q3 when consumption was 305 million litres. Consequently the current quarter is still low by recent historic levels.

Bioethanol consumption fell by 2.6 per cent, from 189 million litres to 184 million litres. Biodiesel consumption increased by 14 per cent, from 125 million litres in 2015 Q1 to 143 million litres in 2016 Q1.

In 2016 Q1, biodiesel accounted for 2.0 per cent of total diesel consumed in transport, and bioethanol 4.5 per cent of motor spirit. The combined contribution of the two fuels was 2.9 per cent, unchanged since 2015 Q1's share and 0.6 percentage points lower than in 2015 Q4

**Relevant tables**

6.1: Renewable electricity capacity and generation.....	Page 47
6.2: Liquid biofuels for transport consumption.....	Page 48

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# 6 RENEWABLES

**Table 6.1. Renewable electricity capacity and generation**

	2014	2015	per cent change	2014 1st quarter	2014 2nd quarter	2014 3rd quarter	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter p	per cent change <sup>11</sup>
<b>Cumulative Installed Capacity <sup>1</sup></b>													<b>MW</b>
Onshore Wind	8,536r	9,188r	+7.6	7,679r	8,003r	8,263r	8,536r	8,708r	8,807r	9,003r	9,188r	9,365	+7.6
Offshore Wind	4,501	5,104r	+13.4	3,764	4,084	4,420	4,501	4,749r	5,024r	5,104r	5,104r	5,104	+7.5
Shoreline wave / tidal	9	9	+2.9	8	9	9	9	9	9	9	9	9	-
Solar photovoltaics	5,424	9,188	+69.4	4,134	4,429	4,841	5,424	7,930r	8,224r	8,581r	9,188	9,600	+21.1
Small scale Hydro	252r	282r	+12.0	240r	242r	245r	252r	261r	267r	272r	282r	285	+9.2
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	1,058r	1,061r	+0.4	1,053r	1,054r	1,057r	1,058r	1,061r	1,061r	1,061r	1,061r	1,061	-
Sewage sludge digestion	215r	216	+0.4	211r	212r	212r	215r	216	216	216	216	227	+4.8
Energy from waste	681r	925r	+35.9	595r	621r	630r	681r	826r	834r	902r	925r	970	+17.4
Animal Biomass (non-AD) <sup>2</sup>	111	111	-	111	111	111	111	111	111	111	111	111	-
Anaerobic Digestion	238r	286r	+20.2	189r	197r	207r	238r	260r	263r	284r	286r	289	+11.2
Plant Biomass <sup>3</sup>	2,245r	2,619r	+16.7	2,030r	2,145r	2,225r	2,245r	2,297r	2,298r	2,976r	2,619r	2,697	+17.4
<b>Total</b>	24,746r	30,465r	+23.1	21,490r	22,583r	23,695r	24,746r	27,904r	28,592r	29,994r	30,465r	31,194	+11.8
Co-firing <sup>4</sup>	15	21	+37.6	15	15	15	15	21r	21r	21r	21	7	-66.8
<b>Generation <sup>5</sup></b>													<b>GWh</b>
Onshore Wind <sup>6</sup>	18,562r	22,887r	+23.3	6,669r	2,994r	2,897r	6,002r	7,182r	4,775r	3,825r	7,106r	6,425	-10.5
Offshore Wind <sup>6, 7</sup>	13,404	17,423r	+30.0	4,384	2,092	2,242	4,686	4,676r	3,578r	3,412r	5,757r	5,142	+10.0
Shoreline wave / tidal <sup>6</sup>	2	2	-10.0	0	1	0	1	1	0	0	0	0	-17.0
Solar photovoltaics <sup>6</sup>	4,040r	7,561r	+87.2	470r	1,475r	1,558r	536r	951r	3,125r	2,690r	795r	1,340	+40.9
Hydro <sup>6</sup>	5,893r	6,289r	+6.7	2,242r	1,114r	784r	1,753r	2,012r	1,426r	1,028r	1,823r	2,048	+1.8
Landfill gas <sup>6</sup>	5,045	4,872r	-3.4	1,268	1,266	1,245	1,266	1,240r	1,212r	1,201r	1,220r	1,159	-6.5
Sewage sludge digestion <sup>6</sup>	846	888r	+4.9	195	228	212	211	223r	231r	215r	219r	206	-7.8
Energy from waste <sup>5</sup>	1,923r	2,782r	+44.7	474r	471r	491r	486r	656r	653r	736r	737r	740	+12.8
Co-firing with fossil fuels	133	183r	+37.6	25	37	37	34	36r	36r	57r	55r	15	-57.5
Animal Biomass (non-AD) <sup>2, 6</sup>	614	648r	+5.5	159	161	132	162	170r	171r	142r	165r	169	-0.3
Anaerobic Digestion	1,019r	1,429r	+40.2	230r	245r	258r	286r	323r	346r	364r	396r	376	+16.5
Plant Biomass <sup>3, 6</sup>	13,105	18,587r	+41.8	2,233	3,064	3,565	4,242	4,351r	4,409r	4,383r	5,443r	5,595	+28.6
<b>Total</b>	64,584r	83,550r	+29.4	18,350r	13,150r	13,420r	19,665r	21,819r	19,961r	18,053r	23,717r	23,215	+6.4
Non-biodegradable wastes <sup>9</sup>	1,923r	2,784r	+44.7	475r	471r	491r	486r	656r	653r	737r	738r	740	+12.8
<b>Load Factors <sup>10</sup></b>													
Onshore Wind	26.4%	29.5%		40.6%r	17.5%r	16.1%r	32.4%r	38.6%r	25.0%	19.5%r	35.4%r	31.7%	
Offshore Wind	37.3%	41.4%		54.4%	24.4%	23.9%	47.6%	46.8%	33.5%r	30.5%	51.1%r	46.1%	
Solar photovoltaics	11.1%	11.8%		6.2%	15.8%	15.2%r	4.7%	6.6%	17.7%	14.5%	4.1%r	6.5%	
Hydro	39.1%	41.2%		60.6%	29.7%	20.6%	46.0%	53.7%r	37.5%r	26.7%r	47.1%r	53.3%	
Landfill gas	54.8%	52.5%		55.9%r	55.0%r	53.4%r	54.3%r	54.2%r	52.3%r	51.2%r	52.1%r	50.0%	
Sewage sludge digestion	46.6%	46.9%		44.1%r	49.4%r	45.2%r	44.7%r	47.8%r	48.9%r	45.0%r	45.8%r	42.5%	
Energy from waste	35.8%	39.6%		38.5%r	35.5%r	35.5%r	33.6%r	40.3%r	36.0%r	38.4%r	36.5%r	35.8%	
Animal Biomass (non-AD)	63.4%	66.9%		66.6%	66.7%	54.1%	66.4%	71.1%r	70.9%r	58.1%r	67.7%r	70.1%	
Anaerobic Digestion	58.0%	62.2%		60.7%r	58.2%r	57.8%	58.1%r	59.9%r	60.5%r	60.3%r	63.0%r	59.8%	
Plant Biomass	71.2%	87.2%		51.9%	67.2%	73.9%	86.0%	88.7%r	87.9%r	75.3%r	88.1%r	96.4%	
<b>Total (excluding co-firing and non-biodegradable wastes)</b>	33.0%	34.5%		41.1%r	27.2%	26.2%	36.7%r	38.3%r	32.3%r	27.8%	35.5%r	34.5%	

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, hospital 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](http://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

	2014	2015 p	per cent change	2014 1st quarter	2014 2nd quarter	2014 3rd quarter	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd Quarter	2015 4th Quarter p	2016 1st Quarter p	per cent change <sup>1</sup>
<b>Volume (million litres)</b>													
Bioethanol	812	795	-2.1	192	206	212	202	189	203	205	198	184	-2.6%
Biodiesel	955	669	-29.9	195	258	273	229	125	152	177	215	143	14.4%
<b>Total biofuels for transport</b>	<b>1,767</b>	<b>1,464</b>	<b>-17.1</b>	<b>387</b>	<b>464</b>	<b>485</b>	<b>431</b>	<b>314</b>	<b>355</b>	<b>382</b>	<b>413</b>	<b>327</b>	<b>4.1%</b>
<b>Energy (thousand toe)</b>													
Bioethanol	458	448	-2.1	108	116	120	114	107	114	116	112	104	-2.6%
Biodiesel	785	550	-29.9	160	212	224	188	103	125	145	177	117	14.4%
<b>Total biofuels for transport</b>	<b>1,242</b>	<b>998</b>	<b>-19.7</b>	<b>268</b>	<b>328</b>	<b>344</b>	<b>302</b>	<b>209</b>	<b>239</b>	<b>261</b>	<b>288</b>	<b>221</b>	<b>5.7%</b>
<b>Shares of road fuels</b>													
Bioethanol as per cent of Motor Spirit	4.6%	4.6%		4.5%	4.5%	4.8%	4.6%	4.6%	4.6%	4.7%	4.5%	4.5%	
Biodiesel as per cent of DERV	3.4%	2.3%		3.0%	3.7%	3.9%	3.1%	1.8%	2.1%	2.4%	2.9%	2.0%	
<b>Total biofuels as per cent of road fuels</b>	<b>3.9%</b>	<b>3.2%</b>		<b>3.6%</b>	<b>4.0%</b>	<b>4.2%</b>	<b>3.7%</b>	<b>2.9%</b>	<b>3.0%</b>	<b>3.3%</b>	<b>3.5%</b>	<b>2.9%</b>	

1. 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](http://www.uktradeinfo.com/Statistics/Pages/TaxAndDutybulletins.aspx)

## Renewable energy in 2015

### Introduction

This article includes a first estimate of the UK's progress against the Renewable Energy Directive (RED) for 2015. It incorporates an update of the proportion of renewable electricity generation for 2015 previously published in the March 2016 issue of Energy Trends, and a first estimate of renewable heat generation. The first three sections describe trends in actual generation for electricity, heat, and renewable transport fuels in 2015. The subsequent sections relate to the methodology used to calculate progress against the Directive and UK progress for 2015. It also includes a brief comparison of member states' progress for 2014, the latest year for which data have been published. Where electricity is described in isolation, GWh are used, though for heat, transport, and electricity when included in overall energy, thousand tonnes of oil equivalent (ktoe) are used.

The following tables are included in this article;

Table 1	Actual renewable electricity generation in TWh
Table 2	Renewable heat generation in ktoe
Table 3	Overall progress against the RED targets.
Table 4	Proportion of renewable electricity generation using three measures
Table 5	Renewable electricity and heat generation and liquid biofuels consumption all measured in ktoe for comparison purposes

### Key messages

*Progress against the Renewable Energy Directive (2009);*

- In 2015, renewable energy provisionally accounted for 8.3 per cent of final energy consumption, as measured using the 2009 Renewable Energy Directive (RED) methodology, an increase of 1.2 percentage points on 2014.
- Renewable electricity accounted for 22.3 per cent of total generation (as measured using the RED methodology), an increase of 4.5 percentage points compared to 2014.
- Renewable heat accounted for 5.6 per cent of total heat consumption, an increase of 0.8 percentage points on 2014.
- Renewable energy for transport accounted for 4.1 per cent of total transport energy, a decrease of 0.8 percentage points compared to 2014.

*Trends in generation;*

- Total renewable energy increased by 2,738 ktoe (20 per cent), from 13,918 in 2014 to 16,656 ktoe in 2015.
- Electricity generation from plant biomass increased by 5,482 GWh (42 per cent) to 18,587 GWh due to a third conversion at Drax Power Station.
- Onshore wind increased by 4,326 GWh (23 per cent) to 22,887 GWh due to an increase in capacity and high wind speeds.
- Solar photovoltaic generation increased by 3,521 GWh (87 per cent) due to an increase in capacity.
- 11 per cent of renewable heat generation is supported by the RHI.

### Renewable electricity generation

In 2015, renewable electricity generation represented 73 per cent of total renewable energy (on an actual generation basis as opposed to using the RED methodology; see table 5 at the end of this article). Renewable generation increased by 19.0 TWh from 64.6 TWh in 2014 to 83.6 TWh in 2015, an increase of 29 per cent. Of this increase, 5.5 TWh was plant biomass which increased by 42 per cent. This was due to the conversion of a third unit at Drax Power Station to high-range co-firing (greater than 85 per cent biomass but less than 100 per cent). Table 1 below shows electricity generation over the last three years by technology;

**Table 1**

<b>Actual generation (TWh)</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>Percentage share in 2015</b>
Onshore Wind	16.9	18.6	22.9	27.4%
Offshore Wind	11.5	13.4	17.4	20.9%
Shoreline wave/Tidal	0.0	0.0	0.0	0.0%
Solar photovoltaics	2.0	4.0	7.6	9.0%
Hydro Small scale	0.7	0.8	1.0	1.2%
Hydro Large scale	4.0	5.1	5.3	6.4%
Landfill gas	5.2	5.0	4.9	5.8%
Sewage sludge digestion	0.8	0.8	0.9	1.1%
Municipal solid waste combustion	1.6	1.9	2.8	3.3%
Co-firing with fossil fuels	0.3	0.1	0.2	0.2%
Animal Biomass	0.6	0.6	0.6	0.8%
Anaerobic Digestion	0.7	1.0	1.4	1.7%
Plant Biomass	8.9	13.1	18.6	22.2%
<b>Total generation</b>	<b>53.3</b>	<b>64.6</b>	<b>83.5</b>	<b>100.0%</b>

Solar photovoltaic showed the largest increase in percentage terms increasing by 87 compared to 2014. This represents an increase of 3.5 TWh to 7.6 TWh. This is driven by an increase in capacity (see table ET 6.1) particularly from larger schemes supported by the Renewables Obligation as well as smaller schemes under the Feed in Tariff (FiT) scheme.

Total wind generation increased by 8.3 TWh (26 per cent). This was partly due to an increase in capacity (see table ET 6.1), particularly for offshore wind, but also higher than average wind speeds (see table ET 7.2). Onshore wind increased by 4.3 TWh from 18.6 TWh to 22.9 TWh, an increase of 23 per cent. Offshore wind increased by less in absolute terms (by 4.0 TWh to 17.4 TWh) but showed higher growth in percentage terms, 30 per cent.

Hydro generation increased by 6.7 per cent from 5.9 TWh in 2014 to 6.3 TWh in 2015 due to increased rainfall in the main hydro catchment areas (see table ET 7.4), the highest since 2011.

Onshore wind continued to be the leading technology with a 27 per cent share, followed by plant biomass (22 per cent), offshore wind (21 per cent), and solar photovoltaic increased its share from 6.3 per cent to 9.1 per cent.

## Heat production

Renewable heat generation accounted for 21 per cent of total renewable sources in 2015 (see table 5 at the end of this article), up slightly (one percentage point) on 2014. The four categories of renewable heat production in the United Kingdom are the direct combustion of various forms of bioenergy, (94 per cent of the total), active solar heating, geothermal, and heat pumps. Table 2 below shows the source mix.

**Table 2**

<b>Heat generation (ktoe)</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>Percentage share in 2015</b>
Landfill gas	13.6	13.6	13.6	0.4%
Sewage sludge digestion	68.3	67.7	73.1	2.1%
Wood combustion - domestic	1,790.3	1,698.1	1,906.2	53.9%
Wood combustion - industrial	374.2	501.4	790.8	22.4%
Animal Biomass	29.1	34.5	30.7	0.9%
Anaerobic digestion	18.5	42.9	95.5	2.7%
Plant Biomass	346.0	379.0	359.4	10.2%
Biodegradable energy from waste	30.1	23.3	45.7	1.3%
Active solar heating	47.9	49.6	50.7	1.4%
Deep geothermal	0.8	0.8	0.8	0.0%
Heat Pumps	116.5	142.5	168.3	4.8%
<b>Total</b>	<b>2,835.3</b>	<b>2,953.5</b>	<b>3,534.8</b>	<b>100.0%</b>

Renewables used to generate heat have grown in recent years, following a decline up to 2005 as a result of tighter emission controls which discouraged on-site burning of biomass, especially wood waste. Policies such as the Renewable Heat Incentive (RHI) and Renewable Heat Premium Payment (RHPP) schemes are designed to support renewable heat production. Around 11 per cent of renewable heat during 2015 was supported through the receipt of RHI payments (372 ktoe, or 4,329 GWh). Domestic use of wood is the main contributor to renewables used for heat – comprising around 54 per cent of the renewable heat total. Non-domestic use of wood and wood waste, and plant biomass formed the next largest components, at 17 per cent and 14 per cent respectively. Heat pumps (mainly in the domestic sector) contributed 4.8 per cent of the renewable heat total.

### **Liquid biofuels for transport**

Liquid biofuels for transport comprised around 6.2 per cent of total renewable sources. Two road transport fuels, biodiesel and bioethanol, are sold blended with diesel and petrol. Up until 2014, biofuel volumes were sourced from The HMRC Hydrocarbon Oils Bulletin and although table 6.2 still reports HMRC data, for the purposes of this article and the Digest of UK Energy Statistics<sup>1</sup>, the data are sourced from The Renewable Transport Fuel obligation (RTFO) statistics published by The Department for Transport<sup>2</sup>. From September's edition of Energy Trends, RTFO will also be included in table 6.2.

In 2015, 674 million litres (554 ktoe) of biodiesel and 797 million litres (449 ktoe) of bioethanol were consumed in 2015; biodiesel consumption was 29 per cent lower than in 2014, whilst bioethanol consumption was 2.1 per cent lower (by volume). During 2015, biodiesel accounted for 2.3 per cent of diesel, and bioethanol 4.6 per cent of motor spirit; the combined contribution of biodiesel and bioethanol was 3.2 per cent by volume, 0.7 percentage points lower than in 2014. The Renewable Energy Directive introduced various sustainability criteria for transport biofuels; certain biofuels derived from waste products (for example, waste cooking oil) have extra weighting when monitoring progress against the transport component, but not the overall target, of the Directive.

### **Progress against the Renewable Energy Directive**

Progress against the RED is measured using a defined methodology. The key adjustments made to actual generation are as follows;

#### *Electricity Generation;*

Generation is uses a normalisation approach for wind and hydro generation to negate the effects of variable wind speeds and rainfall from one year to the next. Normalised wind generation is calculated using the average load factor for the most recent five years and applying to the average of the start and end of year capacity. For Hydro, the load factor is the average of the past 15 years, applied to capacity at the end of the current year.

#### *Heat Generation;*

Net calorific values are used in the heat energy calculation which differs to DUKES which uses Gross Calorific Values. Additionally, heat energy generated by heat pumps includes only those heat pumps meeting the minimum Seasonal Performance Factor (SPF) of 2.5.

#### *Renewable Energy for Transport*

Some liquid biofuels, mostly those derived from waste products, are awarded double credits under the Renewable Transport Fuel Obligation scheme<sup>3</sup>. This applies to the transport specific target of 10 per cent and not in the overall progress calculation. Calorific values are on a net basis as opposed to gross as used in DUKES.

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<sup>1</sup> To be published 28<sup>th</sup> July 2015

<sup>2</sup> [www.gov.uk/government/collections/biofuels-statistics](http://www.gov.uk/government/collections/biofuels-statistics)

<sup>3</sup> [www.gov.uk/guidance/renewable-transport-fuels-obligation](http://www.gov.uk/guidance/renewable-transport-fuels-obligation)

### Overall calculation adjustment

Final total energy consumption (i.e. the denominator) includes a cap on air transport fuel (6.18 per cent).

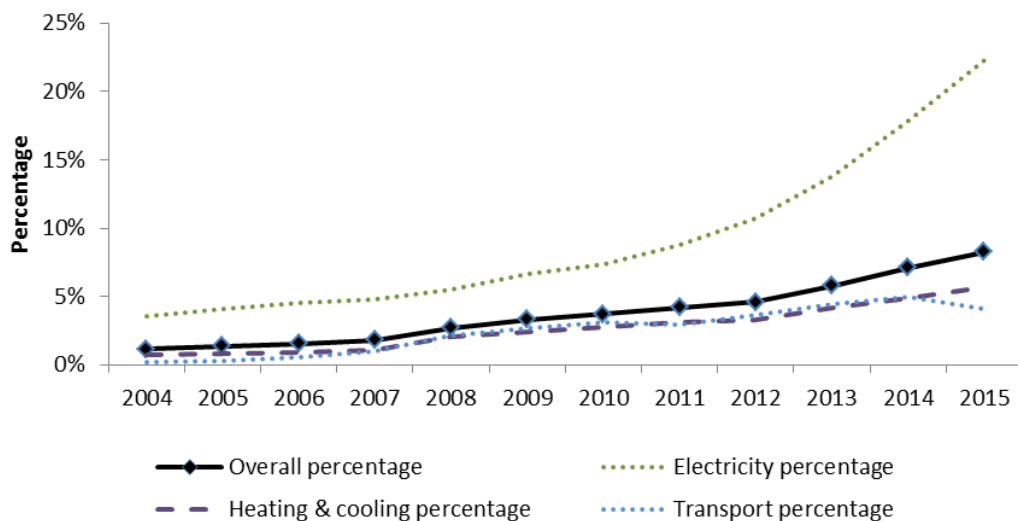
Table 3 shows the increasing share of renewable energy from electricity, heat and transport;

**Table 3: Progress against the 2009 Renewable Energy Directive**

	2004	2010	2013	2014	2015
Percentage of electricity from renewable sources (normalised)	3.5%	7.4%	13.8%	17.9%	22.3%
Percentage of heating and cooling from renewable sources	0.7%	2.7%	4.1%	4.9%	5.6%
Percentage of transport energy from renewable sources	0.2%	3.1%	4.4%	4.9%	4.1%
Overall renewable consumption as a percentage of capped gross final energy consumption using net calorific values (normalised) [not directly calculated from the three percentages above]	1.1%	3.7%	5.8%	7.1%	8.3%

The proportion of renewable electricity is, calculated on a RED basis remains unchanged since the initial estimate in the March 2016 edition of Energy Trends at 22.3 per cent. This is an increase of 4.5 percentage points compared to 2014 Renewable heat also increased though to a lesser extent; from 4.8 per cent in 2014 to 5.6 per cent. Renewable energy in transport as a share of total transport energy decreased by 0.7 percentage points in 2015 to 4.2 per cent. This was due to a reduction in biofuel consumption combined with an increase in total transport energy (the denominator).

**Chart 1: Progress against Renewable Energy Directive**



### Renewable Electricity' Share of Generation (different measures)

In addition to the RED methodology for calculating renewable electricity's share of total generation, using normalisation; it is also calculated on an International Basis (actual generation as a percentage of total generation), and on a Renewables Obligation (RO) basis (generation supported by the Renewables Obligation as a percentage of electricity sales).

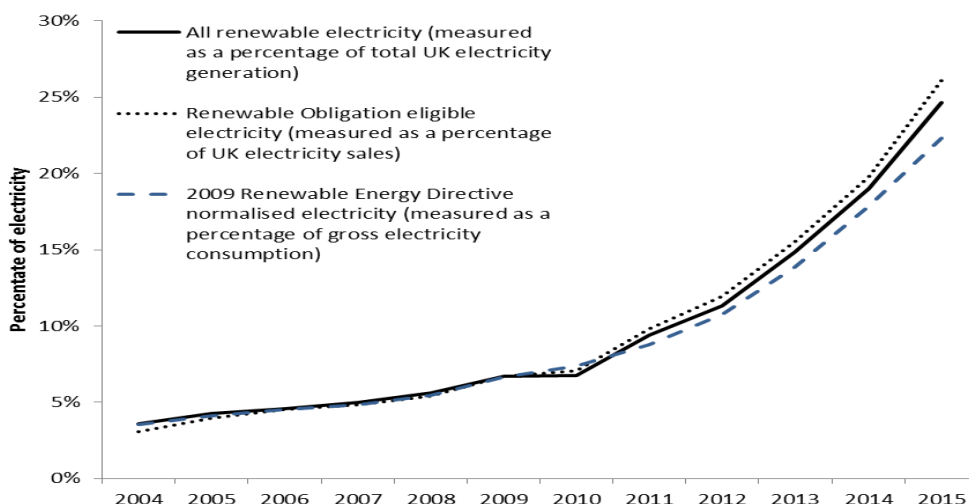
In 2015, the three measures ranged from 22.3 per cent on a RED basis to 26.1 per cent on the RO basis. Table 4 below shows a comparison of the three different measures;

**Table 4**

	2004	2010	2013	2014	2015
International Basis	3.6%	6.8%	14.9%	19.0%	24.6%
Renewable Obligation	3.1%	7.0%	15.5%	19.8%	26.1%
2009 Renewable Energy Directive	3.5%	7.4%	13.8%	17.9%	22.3%

Load factors in 2015 (see table ET 6.1) for wind and hydro generation were high compared to the previous year and to the long term mean due to high wind speeds and high rainfall in the main catchment areas (see tables ET 7.2 and ET 7.4 respectively for weather data). This increased generation due to these weather effects were damped by the normalisation process and in such years, the proportion calculated on a RED basis will tend to diverge from the alternate measures. Chart 2 below shows this divergence tendency;

**Chart 2: Growth in electricity generation from renewable sources since 2004**



### Member state comparison of Progress against the Directive

The UK exceeded its second interim target; averaged over 2013 and 2014, at 6.34 per cent against its target of 5.14 per cent. The Third Progress Report, based on 2013 and 2014, was published in January 2016<sup>4</sup>.

Eurostat publishes data on how all countries are progressing towards their RED (final and interim) targets. The latest comparative data relates to 2014. The 2014 RED percentage for all EU countries combined was 16.0 per cent, an increase of 1.0 percentage point compared to 2013. Sweden achieved the highest share of energy from renewable sources at of the member states with 53 per cent. From 2013 to 2014, the UK increased its share by 1.4 percentage points, the sixth highest increase across member states.

A third of the member states have now exceeded their 2020 targets; Bulgaria, the Czech Republic, Estonia, Croatia, Italy, Lithuania, Romania, Finland and Sweden.

The finalised 2015 figures for all member states will be published by Eurostat during 2017.

<sup>4</sup> <https://ec.europa.eu/energy/en/topics/renewable-energy/progress-reports>

### *Special feature – Renewable energy in 2015*

Taking account of the 2015 result, the UK is now challenged to increase its share of renewable energy by a further 6.7 per cent to meet its 2020 target of 15 per cent. The UK's third interim target is 7.47 per cent averaged across 2015 and 2016 and an initial estimate will be published in June 2017.

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**Table 5: Renewable sources used to generate electricity and heat, and for transport fuels <sup>(1 (2))</sup>**

	Thousand tonnes of oil equivalent		
	2013	2014	2015
<b>Used to generate electricity (3)</b>			
Wind:			
Onshore	1,455.2	1,596.0	1,967.9
Offshore	986.4	1,152.6	1,498.1
Shoreline wave / tidal (4)	0.5	0.2	0.2
Solar photovoltaics	172.7	347.4	650.1
Hydro:	-	-	-
Small scale	58.3	72.2	83.8
Large scale (5)	346.2	434.5	456.9
Bioenergy:	-	-	-
Landfill gas	1,692.4	1,654.6	1,598.0
Sewage sludge digestion	249.6	277.4	291.1
Biodegradable energy from waste	564.7	689.9	982.4
Co-firing with fossil fuels	53.7	25.1	37.8
Animal Biomass (6)	226.4	224.8	235.3
Anaerobic digestion	238.2	334.1	468.6
Plant Biomass (7)	2,009.1	2,912.9	3,847.6
Total bioenergy	5,034.1	6,118.9	7,460.7
<b>Total</b>	<b>8,053.4</b>	<b>9,721.8</b>	<b>12,117.8</b>
Non-biodegradable energy from waste (8)	513.1	696.2	988.7
<b>Used to generate heat</b>			
Active solar heating	47.9	49.6	50.7
Bioenergy:			
Landfill gas	13.6	13.6	13.6
Sewage sludge digestion	68.3	67.7	73.1
Wood combustion - domestic	1,790.3	1,698.1	1,906.2
Wood combustion - industrial	374.2	501.4	790.8
Animal Biomass (9)	29.1	34.5	30.7
Anaerobic digestion	18.5	42.9	95.5
Plant Biomass (10)	346.0	379.0	359.4
Biodegradable energy from waste (6)	30.1	23.3	45.7
Total bioenergy	2,670.1	2,760.6	3,315.0
Deep geothermal	0.8	0.8	0.8
Heat Pumps	116.5	142.5	168.3
<b>Total</b>	<b>2,835.3</b>	<b>2,953.5</b>	<b>3,534.8</b>
Non-biodegradable wastes (8)	155.0	159.3	158.6
<b>Renewable sources used as transport fuels</b>			
as Bioethanol	462.2	458.8	449.1
as Biodiesel	629.4	783.8	554.1
<b>Total</b>	<b>1,091.6</b>	<b>1,242.7</b>	<b>1,003.1</b>
<b>Total use of renewable sources and wastes</b>			
Solar heating and photovoltaics	220.6	396.9	700.8
Onshore wind	1,455.2	1,596.0	1,967.9
Offshore wind	986.4	1,152.6	1,498.1
Shoreline wave / tidal	0.5	0.2	0.2
Hydro	404.5	506.7	540.7
Bioenergy	7,704.2	8,879.6	10,775.7
Deep geothermal	0.8	0.8	0.8
Heat Pumps	116.5	142.5	168.3
Transport biofuels	1,091.6	1,242.7	1,003.1
<b>Total</b>	<b>11,980.3</b>	<b>13,917.9</b>	<b>16,655.7</b>
Non-biodegradable energy from waste (8)	668.1	855.5	1,147.3
<b>All renewables and wastes</b>	<b>12,648.4</b>	<b>14,773.4</b>	<b>17,803.0</b>

(1) Includes some waste of fossil fuel origin.

(2) See the Digest of UK Energy Statistics for technical notes and definitions of the categories used in this table.

(3) For wind, solar PV and hydro, the figures represent the energy content of the electricity supplied but for bioenergy the figures represent the energy content of the fuel used.

(4) Includes the EMEC test facility.

(5) Excluding pumped storage stations.

(6) Includes electricity from poultry litter combustion and meat &amp; bone combustion.

(7) Includes electricity from straw and energy crops.

(8) Non-biodegradable part of municipal solid waste plus waste tyres, hospital waste, and general industrial waste.

(9) Includes heat from farm waste digestion, and meat and bone combustion.

(10) Includes heat from straw, energy crops, paper and packaging.

## Changes to the oil and gas tables

In March 2016, DECC consulted on a number of proposals regarding the annual and quarterly tables. These elicited some interest from industry, particularly regarding ceasing publication of some of the tables (for example, those showing the share of road fuels sold through supermarkets and further detail on inland deliveries for non-energy use). As a result, DECC will consult further and take a final decision on the consultation items later this year.

However, we have made a number of changes to the existing tables in line with the consultation suggestions.

### Inclusion of ‘re-loads’ of Liquefied Natural Gas (LNG) cargoes.

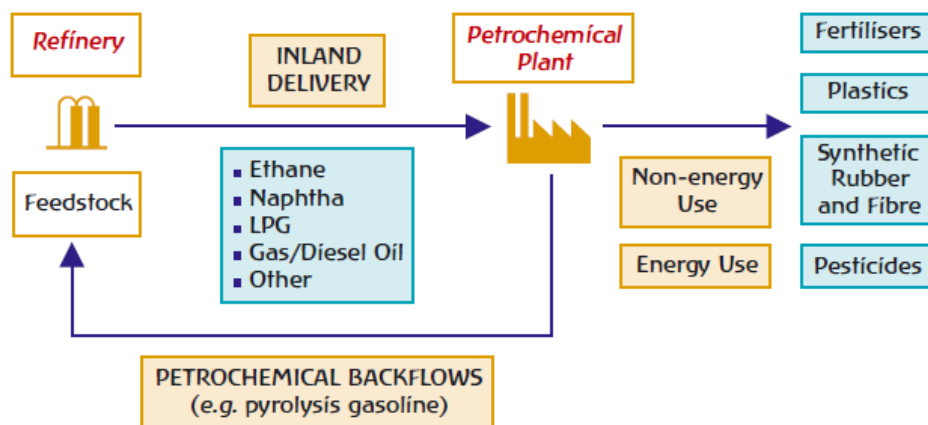
In 2014, the UK made its first reshipment of LNG where volumes of LNG that had been imported and placed into storage were exported. To date, there have been five cargoes and these are now included in the export figures for the UK, as part of the total exports to Belgium. The total volumes of exports were ~3,600 GWh (just under 2 per cent of UK exports). Given that these volumes are relatively small, we have – as yet - not separately identified them in our tables. We will keep this decision under review.

### Inclusion of back-flows from the petrochemical industry.

Whilst most petroleum products are used for energy purposes, substantial volumes are delivered to the petrochemical industry as a feedstock for the manufacturing of plastics, synthetic fibres and other products. These products are used, but they are not combusted.

The refining and petrochemical industries are often closely related as shown in the diagram below. Refineries deliver product to a petrochemical plant for the production of a range of products but they also return some petroleum products back to refineries for further processing.

**Figure 1: Deliveries to the Petrochemical Sector (Source: IEA)**



DECC have previously not separately identified these back-flows but for this edition of the Digest of UK Energy Statistics we have included them under both the upstream side of the balance (in Table 3.1, they are included as part of the ‘feedstocks’ column) and the downstream part of the balance (in Table 3.2, the volumes are shown on the ‘other’ row in the transformation section) to ensure that the downstream supply remains in balance for accounting purposes. We continue to consider how best to reflect these within the balances and welcome comments.

### Changes to marine bunkering figures.

In 2015, DECC expanded its data collection to obtain information from a wider range of suppliers to the UK market. As a result we now have better quality data in several areas, including deliveries to marine bunkers. This additional information indicated an underestimate in the volumes being delivered to international marine bunkers, in the neighbourhood of 300kt in 2015. As a result, we

have revised up our provisional estimates for 2015 and made similar adjustments to the 2013 and 2014 figures.

If you have any questions on these matters, please contact the team.

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## Fixed tariffs within the energy market

### Summary

Around a third of domestic customers are now on fixed tariffs, this proportion having increased in recent years. Fixed tariffs are where the amount a customer pays for their energy is fixed for a predetermined period. The current cheapest tariffs consumers can switch to are generally fixed tariffs. Average annual fixed bills in 2015 were cheaper than average annual variable by £143 for a direct debit dual fuel customer. This difference has grown substantially in the past few years from £20 in 2012.

### Introduction

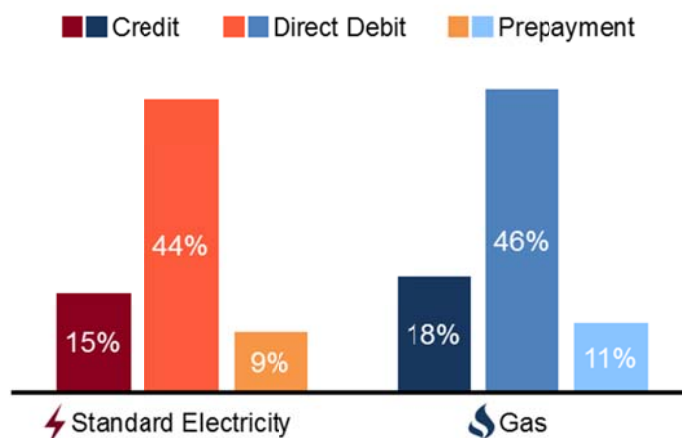
Within the Domestic Energy Market, suppliers offer a large array of different tariffs. Historically almost all tariffs on the market were variable, fluctuating in price following trends in the wholesale market. In recent years however, fixed tariffs have been offered. Fixed tariffs offer consumers a set rate for their energy for a pre-determined period of time. If a company introduces price increases within this period, due to changes in the wholesale energy market, the customers' bills will remain unaffected. However, if price decreases are implemented the bill a customer pays on a fixed tariff will continue to remain unaffected and therefore will not benefit from these price falls.

Data presented at the start of this article is from DECC's Domestic Fuels Inquiry survey<sup>1</sup> which covers the big 6, representing nearly 90% of the domestic market. The proportion of customers that are on fixed tariffs<sup>2</sup> with smaller suppliers may differ compared to the big 6. Data presented on the tariffs currently available has been sourced from a publically available switching site<sup>3</sup>.

### The growth of fixed tariffs

At the end of March 2016, the majority of standard electricity and gas customers in Great Britain<sup>4</sup> were on variable tariffs leaving over 30 per cent of customers on fixed tariffs. As seen in Chart 1, the proportion of customers on fixed tariffs varies greatly by payment type. Direct Debit customers are the most likely to be on fixed tariffs with around 45 per cent of these customers on a fixed deal. A very low proportion of pre-payment customers are currently on fixed tariffs, as a result pre-payment will not be included in the rest of this article.

**Chart 1 Proportion of customers on fixed tariffs by payment type**



<sup>1</sup> [www.gov.uk/government/publications/domestic-energy-prices-data-sources-and-methodology](http://www.gov.uk/government/publications/domestic-energy-prices-data-sources-and-methodology)

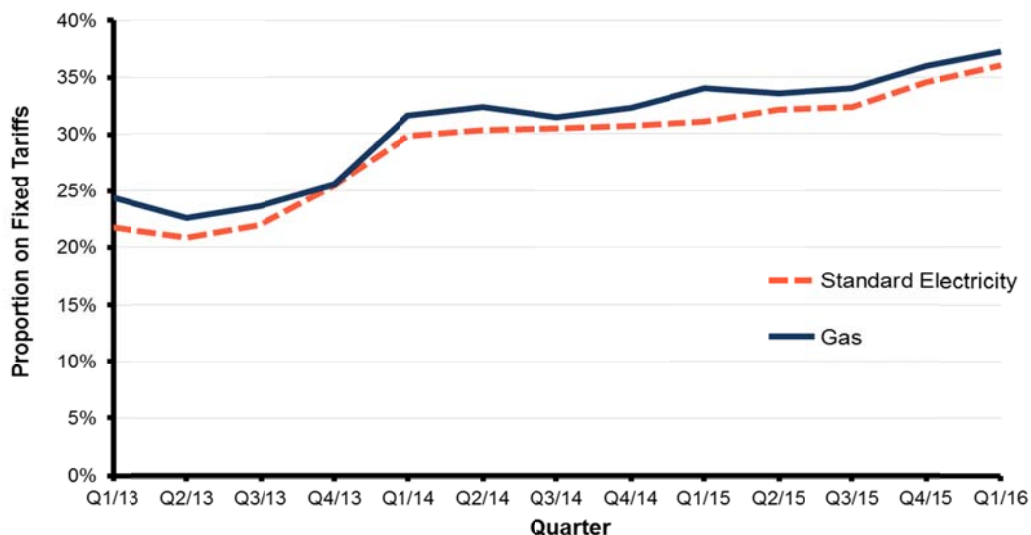
<sup>2</sup> The method used to determine a fixed tariff is dependent on the tariff name and DECC's research of tariffs. It is therefore possible that some fixed tariffs have not been identified and may well have been incorrectly classified as a variable tariff.

<sup>3</sup> Data from [www.UKpower.co.uk](http://www.UKpower.co.uk).

<sup>4</sup> Northern Ireland is not included in this article as it has a different market structure.

The proportion of customers on fixed tariffs has increased in recent years<sup>5</sup> as seen in Chart 2. When prices of variable tariffs are increasing, or at least not decreasing, customers may be more tempted to switch to the cheaper fixed rates. This could explain the sharp increase seen in quarter 1 2014 on the chart below which correlated with an increase in the price of standard variable tariffs. When wholesale prices are low, there are generally more cheap fixed tariffs available, this may explain the continued increase in customers on such tariffs in recent quarters.

**Chart 2 – Percentage of standard electricity and gas customers on a fixed tariff from Q1 2010 to Q1 2016 in GB**



### Fixed tariff bills

Domestic energy prices are published with DECC's Quarterly Energy Prices (QEP)<sup>6</sup> publication. The tables within QEP currently present the average annual bills for domestic gas and electricity (with economy 7 separately<sup>7</sup>). The average bills in QEP include all tariff types and do not show a breakdown for those on fixed tariffs.

In 2015 average **fixed** bills<sup>8</sup> for customers on direct debit (the most common and cheapest form of payment in GB) was £522 for standard electricity which is **£61 cheaper** than the average variable bill. For gas, the average bill was £633, which is **£82 cheaper** than the average variable tariff bill. For standard credit the difference between fixed and variable is less prominent than the average standard electricity for fixed customers being £576, £46 cheaper than the average variable bill. While for gas the average fixed bill being £739 only £25 cheaper than the average variable tariff bill.

Charts 3 and 4 show how the differences between the annual bills of fixed and variable tariff have increased in recent years for both electricity and gas when paying by direct debit.

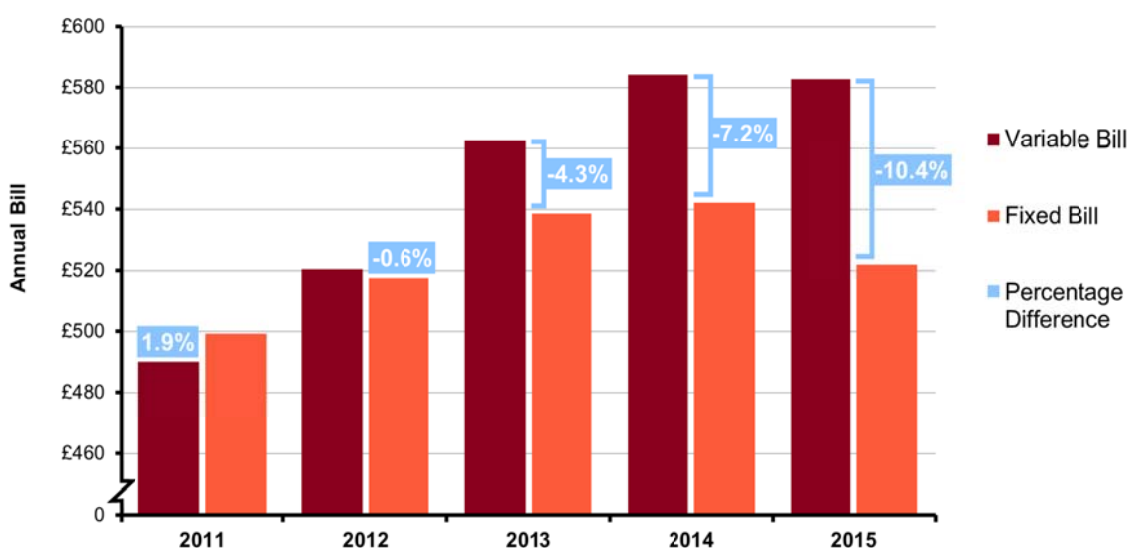
<sup>5</sup> Data on the percentage of people on fixed tariffs can be found in [Table 2.4.2 for standard electricity](#) and [Table 2.5.2 for gas](#).

<sup>6</sup> [www.gov.uk/government/collections/domestic-energy-prices](http://www.gov.uk/government/collections/domestic-energy-prices)

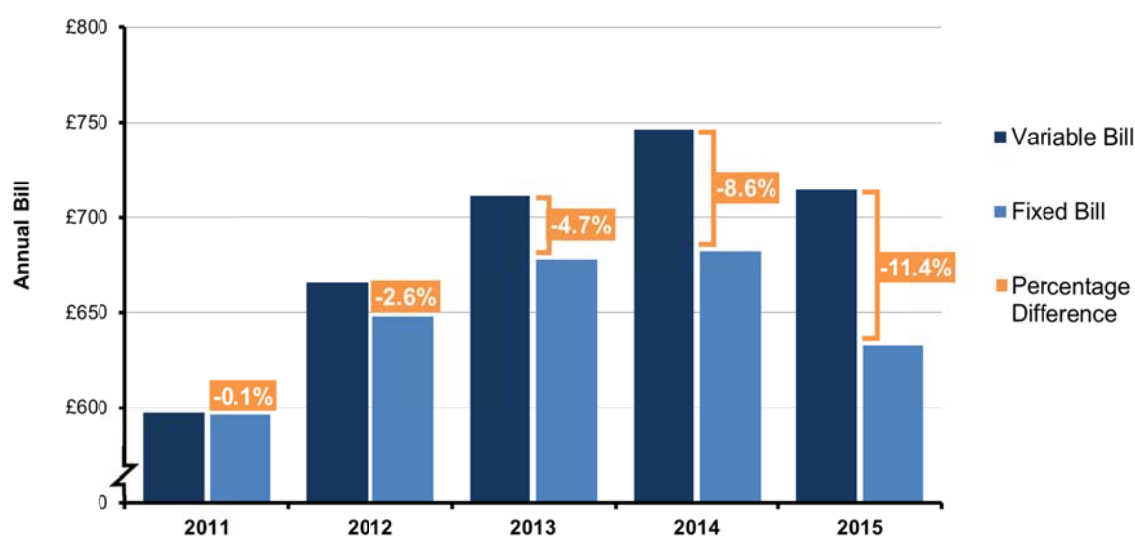
<sup>7</sup> Economy 7 electricity tariffs have a separate unit cost for the night and day and are designed for use with night storage heaters. By contrast, standard electricity tariffs have no distinction in price between night and day. The majority (87%) of all electricity customers are on standard electricity tariffs. Throughout the analysis electricity data corresponds to standard electricity only.

<sup>8</sup> DECC standard consumption levels used of 3,800kWh electricity and 15,000Kwh gas.

**Chart 3 – Average GB direct debit fixed and variable bills for standard electricity since 2011<sup>9</sup>.**



**Chart 4 – Average GB direct debit fixed and variable bills for gas since 2011.**



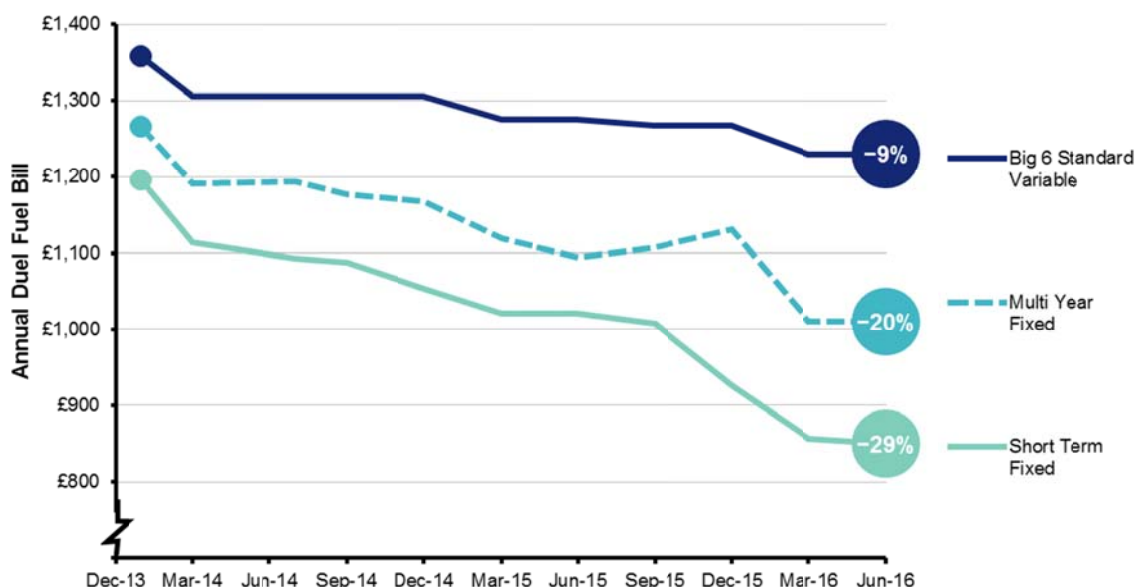
Average annual **fixed** bills have been **cheaper** for direct debit since 2012 compared to the average annual variable bills for direct debit for both gas and standard electricity. The difference between fixed and variable tariffs has been increasing since this point. In 2015 the average standard electricity bill for fixed tariffs were 10.4 per cent lower than the average variable annual bill, this difference having increased from a 0.6 per cent difference in 2012. For gas 2015 fixed tariff bills were 11.4 per cent lower than variable annual bills this difference having increased each year from a 2.6 per cent difference in 2012.

<sup>9</sup> A £12 rebate was applied to all electricity bills in 2014 and 2015

### The cost of market leading fixed tariffs compared to other tariff types

Chart 3 and 4 have shown the growing gap between the average fixed and variable bills, however this does not consider the absolute cheapest tariffs currently on the market. Chart 5 shows that the cheapest short term<sup>10</sup> fixed tariffs have been dropping in price more rapidly than other types of tariff. Since the beginning of 2014, the price of the cheapest short term fixed tariffs have fallen by 29 per cent. In the same period, the cheapest multi year fixed tariffs have fallen by 20 per cent and the cheapest standard variable tariffs from one of the big 6 have only fallen by 9 per cent over this time. In June 2016 the cheapest short term fixed was 31 per cent cheaper than the best available standard variable tariffs of the big 6 this difference having grown from 12 per cent at the beginning of 2014.

**Chart 5 – Comparison of the cost of the cheapest available direct debit dual fuel tariffs<sup>11</sup> over time in London.**



Source: UK power price comparison site

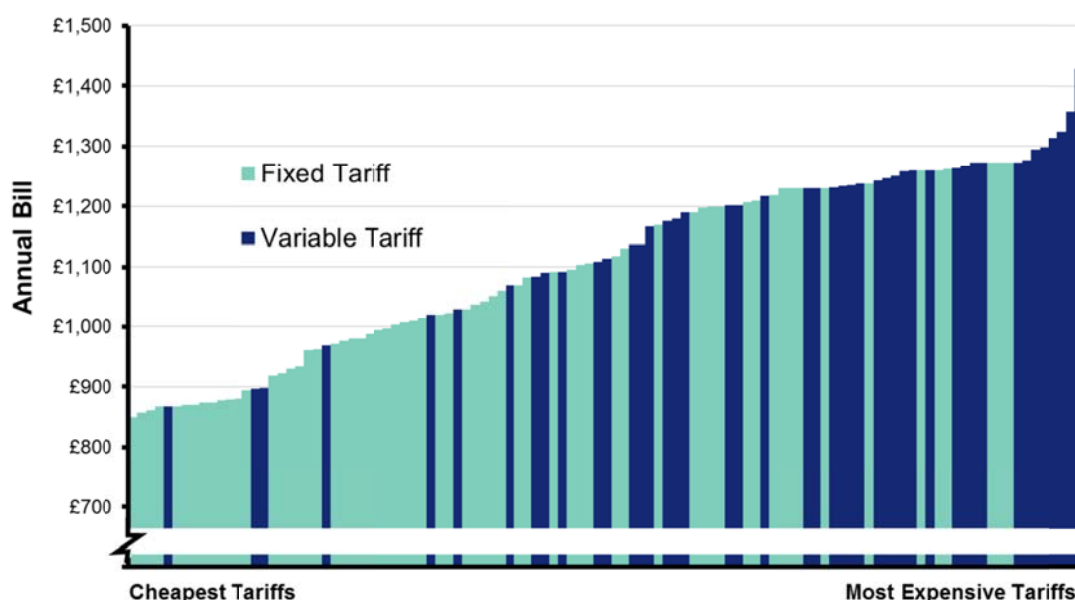
Short term fixed tariffs have generally remained the cheapest on the market, and are offered by most suppliers. However, there have been points where variable tariffs have been cheaper over the past year. These have generally been offered by companies that are newer to the market who are taking advantage of the current climate of falling wholesale prices.

In comparison, most other suppliers do not generally offer these cheaper variable tariffs, offering only a standard variable option (usually more expensive). These suppliers offering short term fixed tariffs as their most competitive tariffs. Chart 6 shows the average annual bill of all of the tariffs available in June 2016, and what type of tariff it is: fixed or variable. This indicates that although a few variable tariffs are amongst the cheapest available to consumers the majority of cheaper tariffs were fixed tariffs.

<sup>10</sup> A tariff is considered to be *Short term* if the period that it is fixed for is less than 2 years.

<sup>11</sup> Data from [www.UKpower.co.uk](http://www.UKpower.co.uk). Consumption levels used were 3,800kWh electricity and 15,000kWh gas. Comparison of the London region only.

**Chart 6: Variations in the price and types of tariffs available to direct debit customers in June<sup>9</sup>**



Source: UK power price comparison site

## Conclusion

This article has shown that more customers have been moving to fixed tariffs, although the majority are still on variable tariffs. The difference in the average annual bills between variable and fixed bills has been increasing over the last few years and fixed tariffs are now over 10 per cent cheaper than variable tariffs in 2015. Although there are some cheap variable tariffs on the market, many suppliers have focused on offering cheap short term fixed tariffs. This has resulted in the majority of cheap tariffs on offer being fixed. This has widened the gap in price between fixed and standard variable tariffs; increasing the value of switching tariffs to customers.

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## **Combined Heat and Power using renewable fuels**

### **Background**

Combined Heat and Power (CHP) is the simultaneous generation of usable heat and power (usually electricity) in a single process. CHP data for the UK as a whole are updated annually and published in the Digest of United Kingdom Energy Statistics (DUKES), the latest edition of which was published in July 2015.

This article summarises the policy support measures that have given support to CHP installations that use renewable fuels, and presents various breakdowns of such CHP over the last ten years (2003 to 2014).

The data presented originates from a CHP database maintained by Ricardo Energy & Environment on behalf of the Department of Energy and Climate Change (DECC). Data relating to the overwhelming majority of CHP electrical capacity (about 99 per cent of total capacity) is received annually from the reliable sources of the Combined Heat and Power Quality Assurance (CHPQA) programme, the Iron and Steel Statistics Bureau (ISSB) and from Ofgem's Renewable Obligations Certificates (ROCs) returns. Data from CHP schemes not covered by the above sources are extrapolated from historic data.

### **UK Policies supporting renewable CHP**

#### **Combined Heat and Power Quality Assurance programme**

The Combined Heat and Power Quality Assurance programme (CHPQA) is a government initiative providing a practical, determinate method for assessing all types and sizes of Combined Heat & Power (CHP) schemes throughout the UK. CHP (or cogeneration) is the simultaneous generation of heat and power in a single process, and provides one of the most cost-effective approaches for making carbon savings. CHPQA aims to monitor, assess and improve the quality of UK Combined Heat and Power.

CHPQA certification grants CHP owners/operators access, depending on specific circumstances, to a number of benefits, including eligibility for support for CHP using certain renewable fuels via the following:

- Renewables Obligation Certificates (ROCs)
- Contracts for Difference (CfD)
- Renewable Heat Incentive (RHI)

In addition, Feed-in Tariffs (FiTs) are available for electricity generated from anaerobic digestion (excluding sewage and landfill gases), applying equally to CHP plant or power-only generation of this type.

#### **The Renewables Obligation**

The Renewables Obligation (RO) was introduced to support electricity generation from renewable sources. The RO came into effect in 2002 in England and Wales, and Scotland, followed by Northern Ireland in 2005. It places a mandatory requirement on UK electricity suppliers to source a growing percentage of electricity from eligible renewable generation capacity. Suppliers are required to produce evidence of their compliance with this obligation via certificates, referred to as Renewables Obligation Certificates (ROCs).

Support for CHP technology under the RO commenced on 1<sup>st</sup> April 2006 across the whole of the UK through the Renewables Obligation Order 2006, covering England and Wales, and the equivalent Orders for Scotland and Northern Ireland. The eligible renewables sources included those CHP generating stations fuelled wholly or partly by waste, and which were accredited under the CHPQA programme.

The 2009 Renewables Obligation Orders covering the UK came into effect on 1<sup>st</sup> April 2009. They introduced the concept of "banding" to the RO, meaning the provision of varying levels of support

### *Special feature – Renewable CHP*

(ROCs/MWh) for different types of renewable generation. In addition to energy from waste with CHP, the 2009 Orders introduced four further specific CHP generation types. With the exception of dedicated energy crops, this provided a higher level of support than the equivalent power-only generation types (Table 1).

**Table 1 : Renewables Obligation Orders 2009: banding for CHP and equivalent power-only generation types**

Fuel	ROCs per MWh	
	With CHP	Power-only
Energy from waste	1.0	Not eligible
Co-firing of biomass	1.0	0.5
Co-firing of energy crops	1.5	1.0
Dedicated biomass	2.0	1.5
Dedicated energy crops	2.0	2.0

In 2011-2012 DECC undertook a review of banding under the Renewables Obligation, including a consultation on proposals for the levels of banded support for the period 2013-17. This culminated in the Renewables Obligation (Amendment) Order 2013, which split co-firing into low, medium and high-range generation types, both power-only and with CHP. Station/unit conversion with CHP was added and co-firing with bio-liquids given a separate band. Furthermore, differing levels of support were specified for capacity in 2013/14, 2014/15, 2015/16 and post 2016. Except for dedicated energy crops, for each year all CHP generation types were assigned an uplift of 0.5 ROCs/MWh compared with the level of support for their power-only equivalents.

However, from 1 April 2015 no ROC uplift for CHP is available where the heat produced would be eligible for the Renewable Heat Incentive (RHI). This effectively excludes all technologies from receiving the CHP uplift except co-firing of regular bioliquid with CHP or station/unit conversion with CHP where the fuel is regular bioliquid. Energy from Waste (EfW) with CHP remains at 1 ROC/MWh for all years. EfW CHP schemes certified by CHPQA are not eligible for RHI.

The RO is scheduled to close to new capacity on 31 March 2017, as set out in the RO Closure Order 2014. Support for capacity accredited under the RO by that date will be retained at existing support levels (i.e. support is grandfathered) and will receive its full lifetime of support, with grace periods offered to those who miss the closure date in certain circumstances.

The government introduced the Contracts for Difference (CFD) scheme in 2014 which will replace the RO when it closes. During the transition period, when both schemes are open, generators are able to choose between the schemes, subject to eligibility.

Renewables Obligation statistics are available at:

<https://renewablesandchp.ofgem.gov.uk/Public/ReportManager.aspx?ReportVisibility=1&ReportCategory=0>

### **Contracts for Difference**

The Contracts for Difference (CfD) regulations came into force in Great Britain on 1 August 2014; CfDs will replace the Renewables Obligation for new projects from 1 April 2017, although RO grace periods allow certain slippage to commissioning beyond 31 March 2017. A final decision has still to be taken by Northern Ireland as to its inclusion in the CfD mechanism. CfDs are awarded competitively to the best value projects via an allocation-round process.

A generator party to a CfD is paid the difference between the 'strike price' (a price for electricity reflecting the cost of investing in a particular low carbon technology), and the 'reference price' (a measure of the average market price for electricity). In the event that the reference price exceeds the strike price the generator pays the difference to the Low Carbon Contracts Company (LCCC), a Government-owned but arms-length company.

Dedicated Biomass with CHP and Energy from Waste with CHP are eligible to compete for support in CfD allocation rounds; their counterpart power-only projects are not eligible for CfD support. Dedicated biomass means that the station is fuelled by solid biomass.

Energy from waste (EfW) with CHP schemes are not eligible for CfDs support if they have also applied for support under the RHI, as the CfD strike prices for EfW with CHP are based on both the power and heat component supplied (unlike those for biomass CHP schemes that are based on 'power only').

To be eligible for CHP specific CfDs, the operator will need to provide a valid CHPQA GN44 certificate, confirming that the scheme either partially or fully qualifies as Good Quality under the CHPQA criteria. Support under the CfD will be paid only on the proportion of metered electrical output assessed by CHPQA to be Qualifying Power Output. This is applied in the CfD contract by applying a CHP Qualifying Multiplier (the ratio of Qualifying Power Output to the Total Power Output) to the total electrical output of the plant.

CfDs are also open to electricity generating stations using biogas from anaerobic digestion, other than landfill and sewage gas, where the capacity is greater than 5 MWe. If such a station was CHP then the heat would in principle be eligible for the RHI, but would not need to be certified under CHPQA. Similarly, new sewage gas CHP schemes are eligible in principle for CfDs and the RHI, though with no capacity limitations on either power or heat.

In the first CfD allocation round two EfW CHP projects totalling nearly 95 MWe of capacity were successful. The delivery year for these projects is 2018-2019.

### **The Renewable Heat Incentive**

The Renewable Heat Incentive (RHI) was launched in November 2011 and provides support to renewable heat technologies in order to increase deployment and aid market development, with the ultimate aim of reducing the costs of installation. The RHI supports renewable heat where that heat is used in a building for 'eligible purposes', which are: heating a space, heating water, or for carrying out a process where the heat is used.

Dedicated solid biomass schemes are eligible for the higher solid biomass CHP tariff on their eligible heat output if:

- the installation/relevant combustion unit(s)/conversion from power only generation was commissioned on or after 4 December 2013;
- the relevant combustion unit(s) are new at the time of installation;
- the installation is certified under CHPQA. Applicants will have to provide evidence of current CHPQA certification as part of the accreditation process in order to be awarded this tariff;
- the relevant combustion unit(s) are designed and installed to burn solid biomass only (not including solid biomass contained in waste); and
- the relevant combustion unit(s) comply with air quality requirements

Thus to qualify for the solid biomass CHP tariff, a scheme has to have a CHPQA certificate but does not have to fully qualify as Good Quality CHP. However, the CHP tariff will be eligible only for heat generated by the engine or extracted from the turbine.

Energy from Waste CHP stations accredited under the RO are not eligible for support under the RHI.

Detailed statistics on the RHI are available at:

[www.gov.uk/government/collections/renewable-heat-incentive-statistics](http://www.gov.uk/government/collections/renewable-heat-incentive-statistics)

## **Feed-in Tariffs**

The Feed-in Tariff (FiT) was introduced by the UK Government from 1 April 2010 in order to support renewable electricity generating technologies up to 5 MWe in capacity. The only renewable fuel CHP technology supported by the FiT scheme is power generation from anaerobic digestion (excluding sewage gas) and there is no distinction between CHP and power-only generators so no CHPQA certification is required.

Solid biomass, sewage gas and landfill gas generators were specifically excluded from the FiT scheme on the basis that there was adequate support available through the Renewables Obligation.

Detailed statistics on FiTs are available at: [www.gov.uk/government/statistics/monthly-small-scale-renewable-deployment](http://www.gov.uk/government/statistics/monthly-small-scale-renewable-deployment)

**Table 2 Summary of support to CHP schemes where certification under CHPQA is not required.**

	Heat	Electricity	
	RHI	FiTs	CfDs
Biogas (AD – excl. sewage and landfill gases)	Yes	Yes, ≤ 5 MWe.	Yes, > 5 MWe.
Biogas (AD – sewage)	Yes	No	Yes
Biogas (gasification)	Yes	No	Yes
Biogas (pyrolysis)	Yes	No	Yes

## **Evolution of Renewable CHP capacity, outputs and technologies used over recent years**

When reviewing the uptake of renewable CHP over the years in the context of policy developments, it is instructive to look at the available data both including and excluding CHP schemes at sewage treatment works. This is because, as discussed earlier, CHP at sewage treatment works have been largely unaffected by the policy environment. As such, while developments in renewable CHP including sewage treatment works are interesting in their own right, removing them from the analysis allows a clearer correlation to be made between renewable CHP development and policy development.

Presented below are the trends in renewable CHP deployment, firstly including sewage treatment works and then excluding them.

### **Analysis - Including CHP schemes at sewage treatment works**

DUKES presents CHP statistics in Chapter 7, but largely provides only high level figures for plant using renewable fuels. The following tables and figures are based on the same data sets as used for DUKES 2015, but examine further some of the underlying details of renewable CHP.

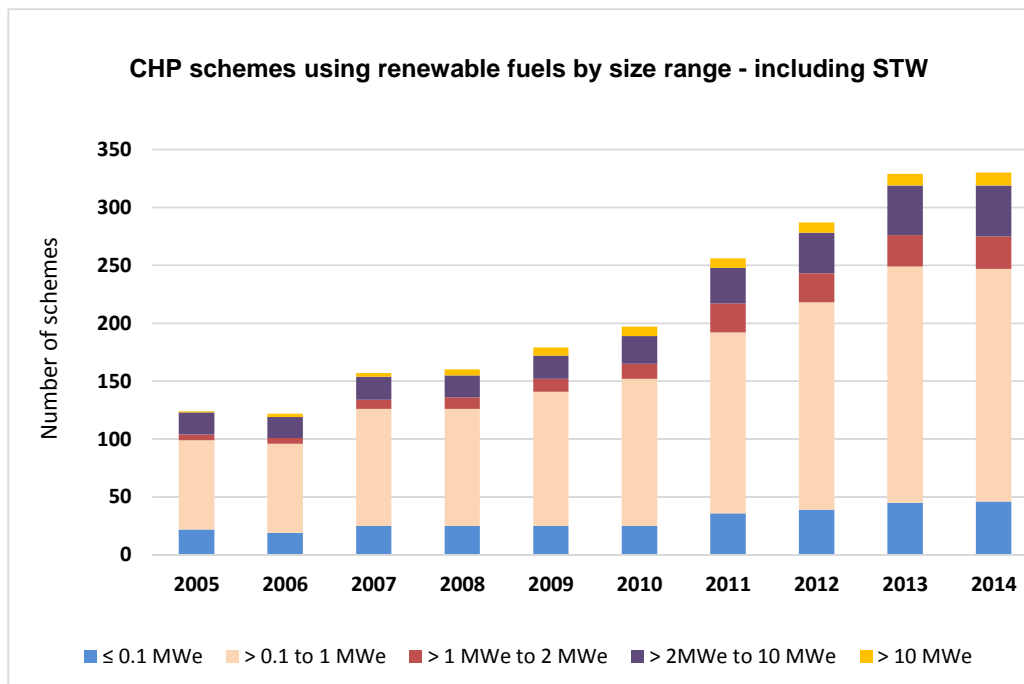
Table 3 and Chart 1 show the growth in the total number of UK CHP schemes that use, at least in part, renewable fuels over the last 10 years. Also presented is the breakdown of scheme numbers according to Qualifying Power Capacity (QPC) range. Over the period 2005-2014 there has been a steady increase in the number of renewable CHP schemes.

Chart 1 shows the growth in the total number of UK CHP schemes that use, at least in part, renewable fuels over the last 10 years. Also presented is the breakdown of scheme numbers according to Qualifying Power Capacity (QPC) range. Over the period 2005-2014 there has been a steady increase in the number of renewable CHP schemes.

**Table 3: UK total number of CHP schemes using renewable fuels, 2005 to 2014, including STW**

Size range	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
≤ 0.1 MWe	22	19	25	25	25	25	36	39	45	46
> 0.1 to 1 MWe	77	77	101	101	116	127	156	179	204	201
> 1 MWe to 2 MWe	5	5	8	10	11	13	25	25	27	28
> 2 MWe to 10 MWe	19	18	20	19	20	24	31	35	43	44
> 10 MWe	1	3	3	5	7	8	8	9	10	11
<b>Total</b>	<b>124</b>	<b>122</b>	<b>157</b>	<b>160</b>	<b>179</b>	<b>197</b>	<b>256</b>	<b>287</b>	<b>329</b>	<b>330</b>

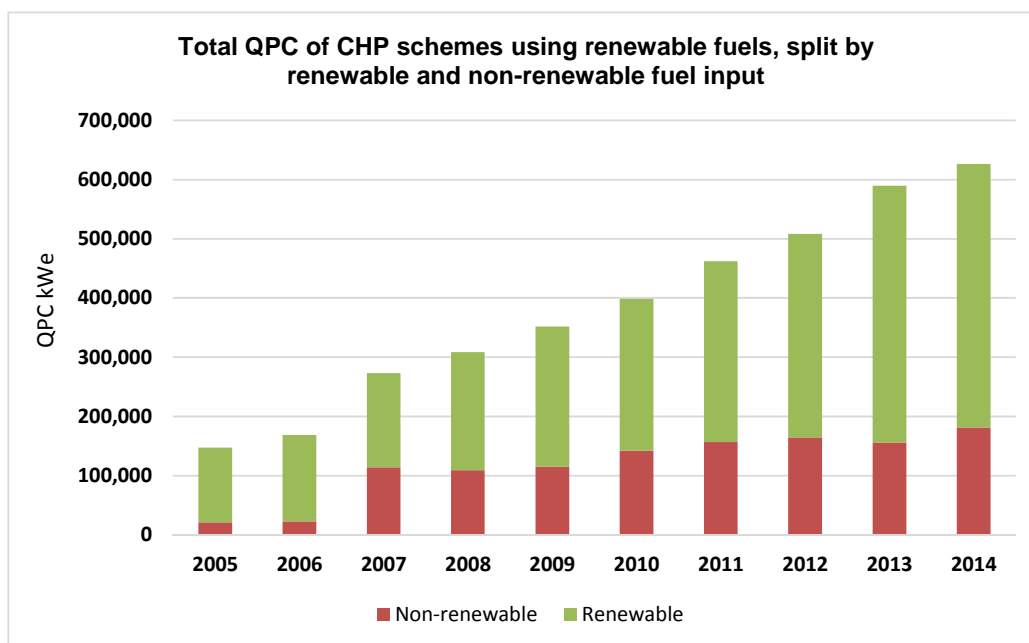
**Chart 1 Number of UK CHP schemes using renewable fuels by size range – including sewage treatment works (STW)**



Many schemes use both renewable and non-renewable (i.e. fossil) fuels. This may be because of the need to achieve a certain minimum calorific value of fuel sent to the CHP prime mover or due to considerations of fuel availability and cost. Chart 2 shows the qualifying CHP power capacity<sup>1</sup> of schemes, split on a pro-rata basis between that assigned to renewable and that to non-renewable fuels. The renewable CHP capacity by plant size range, by year is shown in Table 4 and the split for 2014 in Chart 3. Capacity is dominated by schemes over 2MWe, with 76 per cent of capacity > 2MWe, whilst the greatest numbers of schemes are in the 0.1 to 1 MWe range (Table 3).

<sup>1</sup> This is the capacity that qualifies, or would qualify, as 'Good Quality' CHP under the CHPQA programme where it is referred to as Qualifying Power Capacity (QPC). Any additional power capacity not qualifying is considered to be power-only generation. See [www.gov.uk/guidance/combined-heat-power-quality-assurance-programme](http://www.gov.uk/guidance/combined-heat-power-quality-assurance-programme) for further details.

**Chart 2 Total Qualifying Power Capacity (QPC) of CHP schemes using renewable fuels, split by renewable and non-renewable fuel input**



**Table 4: Qualifying Power Capacity (kW<sub>e</sub>) of CHP schemes using renewable fuels scaled by renewable inputs, 2005 to 2014 - including STW**

Size range	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
≤ 0.1 MWe	1,401	1,210	1,814	1,749	1,988	1,943	2,285	2,601	2,866	2,922
> 0.1 to 1 MWe	27,211	27,808	35,498	35,445	39,087	42,992	52,782	59,849	70,352	68,194
> 1 MWe to 2 MWe	6,610	8,319	11,895	14,995	15,288	18,781	33,071	34,164	38,005	37,641
> 2MWe to 10 MWe	78,586	76,190	77,489	72,517	81,050	91,000	115,307	130,795	169,464	181,150
>10 MWe	12,113	32,549	32,083	74,941	99,585	101,844	102,084	116,830	153,006	154,610
<b>Total</b>	<b>125,922</b>	<b>146,076</b>	<b>158,779</b>	<b>199,648</b>	<b>236,998</b>	<b>256,561</b>	<b>305,530</b>	<b>344,240</b>	<b>433,693</b>	<b>444,518</b>

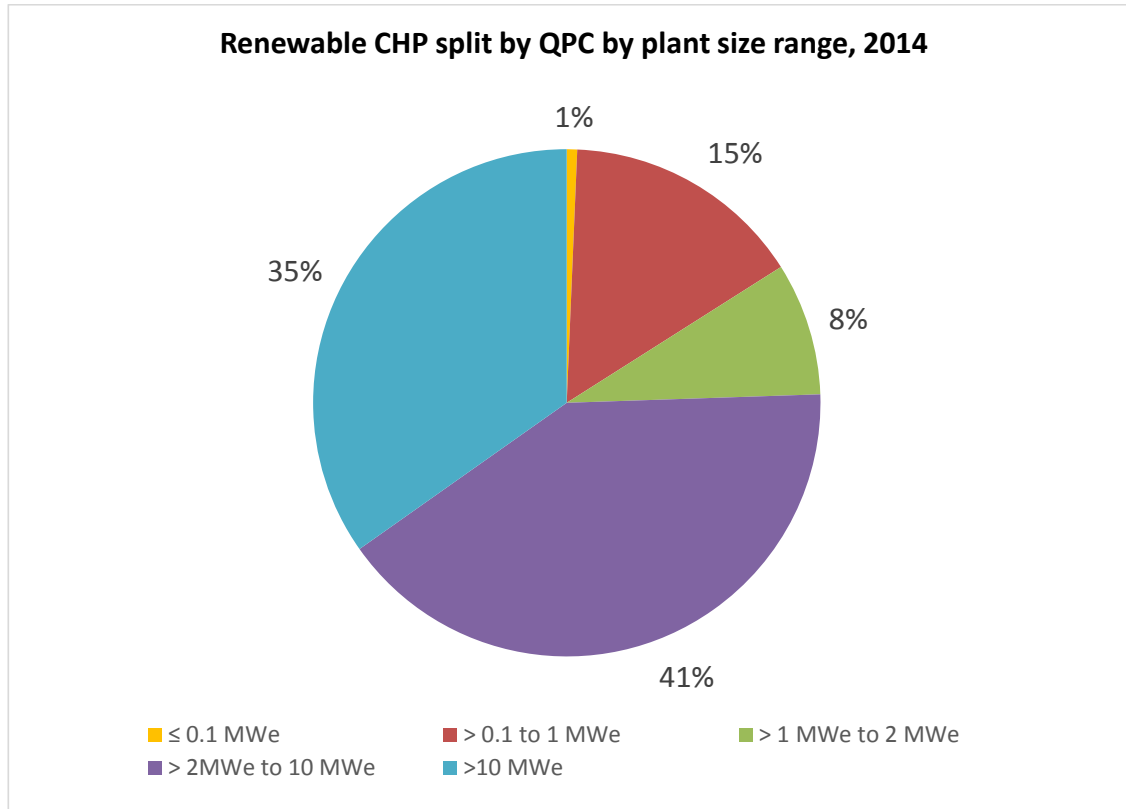
**Chart 3 Renewable CHP Qualifying Power Capacity (QPC) split by plant size range**

Table 5 shows the types of fuel consumed in renewable CHP schemes. In 2014 the most used fuel was solid biomass, followed by sewage gas and then biodiesel, bioethanol.

Table 5: Type of renewable fuel consumed										
Fuel type	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Biodiesel, bioethanol etc	0	0	0	0	1,350	16,453	17,518	63,456	1,099,295	1,387,370
Biomass (energy crops, waste wood, chicken litter, etc.)	473,051	659,531	659,243	1,574,109	1,681,402	1,905,501	2,183,014	2,449,269	1,951,371	3,454,626
Domestic refuse (raw)	693,354	1,016,851	953,720	1,394,133	1,275,428	1,425,601	1,418,897	1,223,581	1,205,069	1,153,348
Other Biogas (e.g. gasified woodchips)	31,823	26,742	12,114	3,859	21,899	66,332	369,004	562,358	1,029,395	1,056,954
Other liquid waste (renewable)	0	0	0	0	0	0	0	0	11,170	2,564
Refuse-derived Fuels (RDF)	166,620	163,051	131,925	116,251	84,830	38,430	83,445	83,543	0	105,018
Sewage gas	1,482,770	1,316,635	1,442,780	1,505,171	1,708,920	2,044,806	2,239,097	2,222,790	2,212,425	2,399,895
Wood Fuels (woodchips, logs, wood pellets, etc.)	0	0	0	0	559,780	1,035,140	542,045	662,659	1,412,104	579,668
<b>Total</b>	<b>2,847,618</b>	<b>3,182,810</b>	<b>3,199,783</b>	<b>4,593,523</b>	<b>5,333,609</b>	<b>6,532,263</b>	<b>6,853,021</b>	<b>7,267,656</b>	<b>8,920,829</b>	<b>10,139,443</b>

Of the 330 renewable CHP schemes at the end of 2014, 194 serve sewage treatment works where CHP has been established practise for many years. In 2005 they comprised 116 of the 124 total renewables schemes (Chart 4) and around 77% of renewable CHP capacity in the UK. The growth in the number of CHP schemes at sewage treatment works is also shown in Chart 4.

**Chart 4 Number of Sewage Treatment Works (STW) CHP schemes**

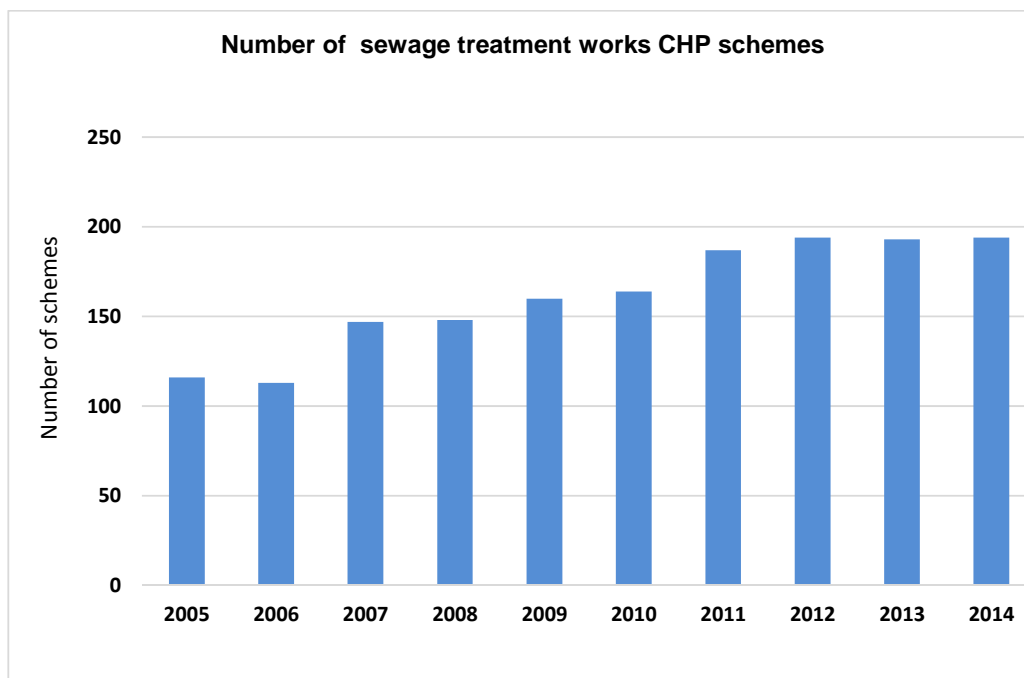


Figure 1 Number of CHP schemes at sewage treatment works

Given that CHP at sewage treatment works has been an established practice for some years and that they have been broadly unaffected by the policy landscape, means that, when trying to gain an appreciation of the effect that CHP policy has had on the take-up of renewable CHP, it is instructive to remove sewage treatment works CHP schemes from the analysis. The analysis in the next section is carried out on this basis.

### Analysis - Excluding CHP Schemes at sewage treatment works

To see more clearly how other renewable CHP schemes have increased over the last ten years, the following tables and figures exclude all schemes at sewage treatment works. Table 6 shows the evolution in the number of such CHP schemes and how the Qualifying Power Capacity (QPC) is apportioned over the different size ranges.

Size range	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
≤ 0.1 MWe	1	0	0	1	1	1	8	8	15	16
> 0.1 to 1 MWe	1	2	2	2	6	16	35	56	81	78
> 1 MWe to 2 MWe	0	0	0	0	1	1	8	7	9	9
> 2MWe to 10 MWe	5	4	5	4	4	7	10	13	21	22
> 10 MWe	1	3	3	5	7	8	8	9	10	11
<b>Total</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>12</b>	<b>19</b>	<b>33</b>	<b>69</b>	<b>93</b>	<b>136</b>	<b>136</b>

Chart 5 shows the data in Table 6 graphically. These data show that there has been a rapid increase in the number of schemes, starting about 2010, after the introduction of the RO banding in 2009.

**Chart 5 Number of UK CHP schemes using renewable fuels split by size range – excluding STW**

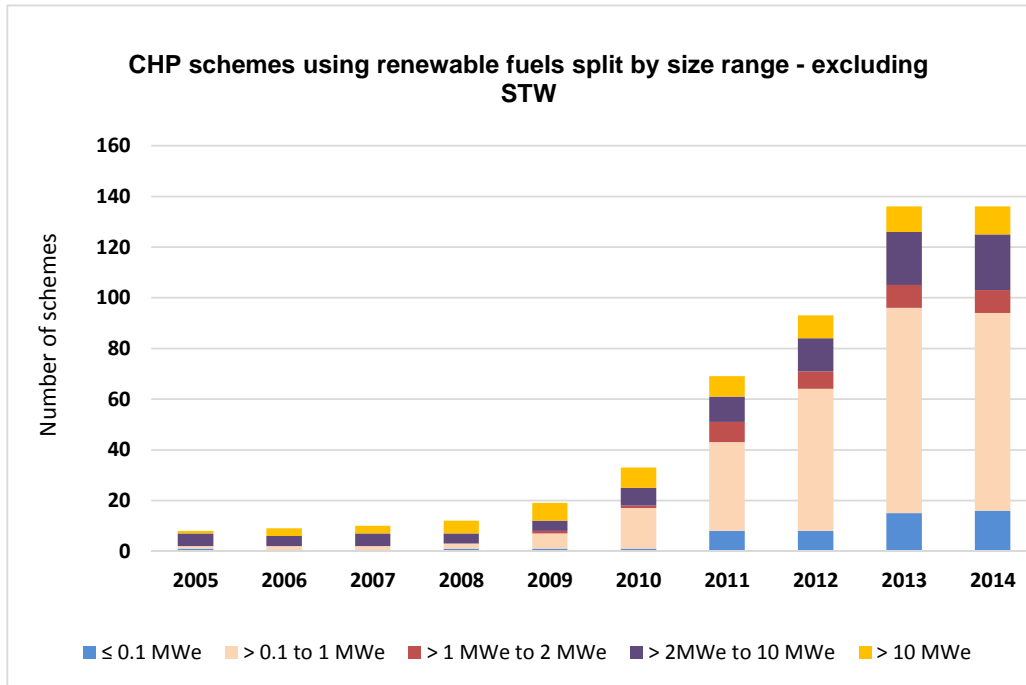
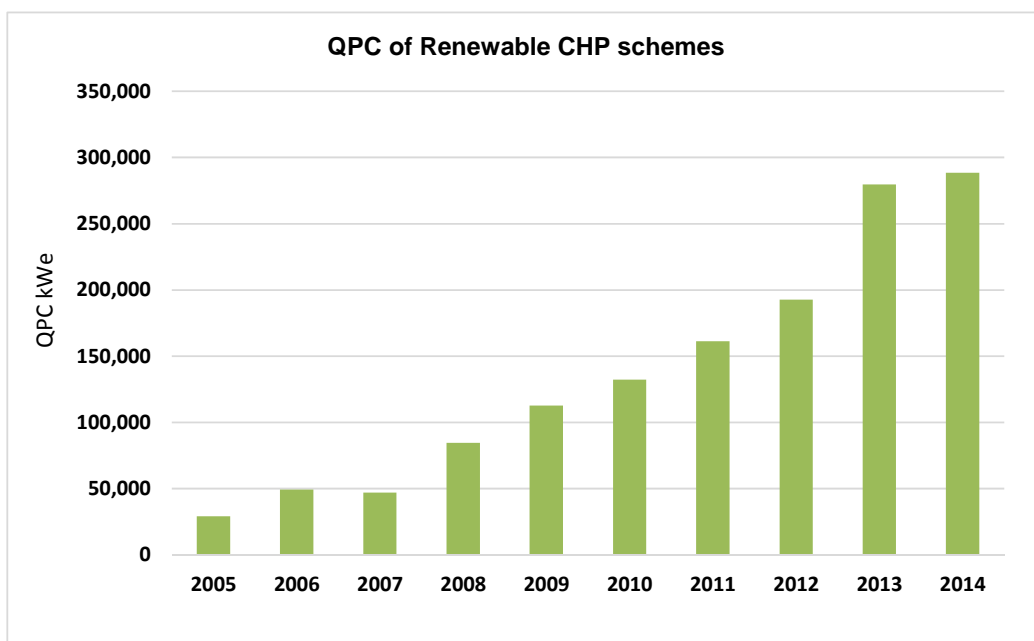


Chart 6 shows how the renewable CHP capacity has increased for the same schemes illustrated in Chart 5. While the number of renewable schemes has increased seven-fold since 2009 the power capacity has increased by about 2.5 times. This is explained by the large increase in the number of schemes in the relatively small capacity range of 100 kW to 1 MWe.

**Chart 6 Evolution of QPC of renewable CHP schemes – excluding schemes at sewage treatment works**



The significant increase in the numbers of renewable schemes over the last 5 years or so may be largely attributed to the availability of the policy support mechanisms described earlier in this article, particularly the Renewables Obligation from April 2009. Access to this support continues to be principally through certification under CHPQA, which acts as a gate-keeper for ensuring that only genuine CHP is able to obtain additional support compared with that which might be available to power-only or heat-only installations.

CHPQA certification is not required where benefits can be gained separately for renewable heat and renewable electricity at the same rates that heat-only and power-only plants attract. The main circumstances where this is the case are where heat and power is generated from biogas (excluding sewage and landfill gases) produced from anaerobic digestion (AD) and are eligible for FiTs and the RHI. Of the 136 renewable CHP schemes in 2014 (excluding STW) 77 were certified under CHPQA). The remaining 59 are overwhelmingly schemes using biogas from AD and with an electrical capacity below 5 MWe. As of the end of 2014, there were 216 AD FiT commissioned installations ([www.gov.uk/government/statistics/monthly-small-scale-renewable-deployment](http://www.gov.uk/government/statistics/monthly-small-scale-renewable-deployment)). The FiT statistics do not distinguish between power-only and CHP plant.

Therefore, the effect of the policy support mechanisms on the deployment of CHP is best understood by looking at the evolution of renewable CHP schemes certified under CHPQA, which are not schemes at sewage treatment works. Tables 7 and 8 present the number of such schemes and their aggregate capacity over the years.

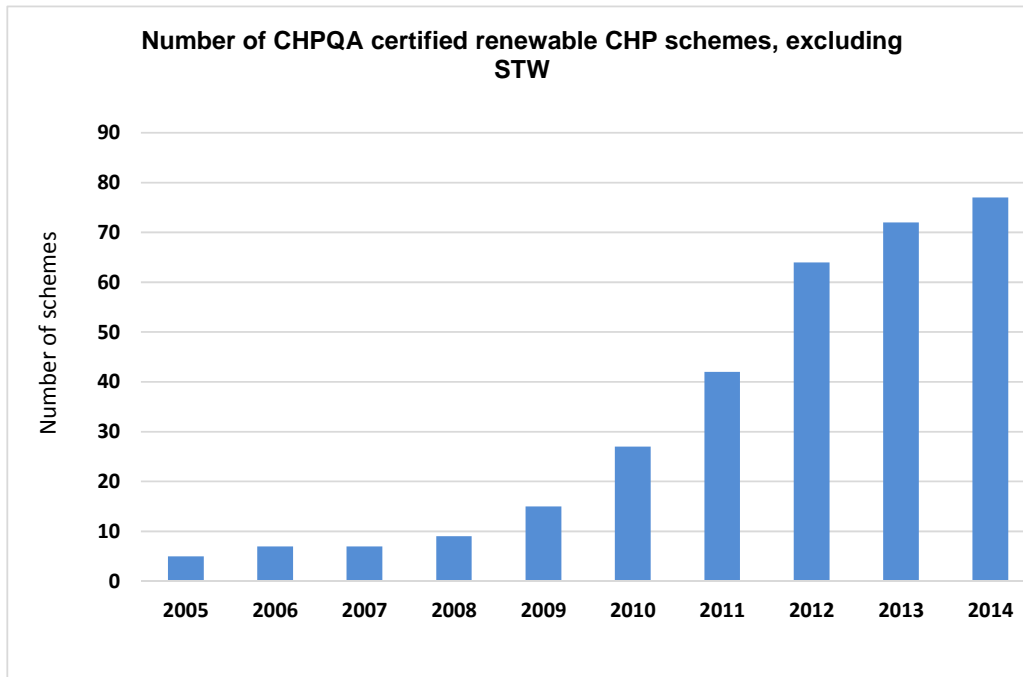
Size range	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
≤ 0.1 MWe	0	0	0	1	1	0	3	4	3	4
> 0.1 to 1 MWe	0	1	0	0	4	13	22	39	45	45
> 1 MWe to 2 MWe	0	0	0	0	1	1	2	2	1	1
> 2MWe to 10 MWe	4	4	5	4	4	7	9	11	14	17
> 10 MWe	1	2	2	4	5	6	6	8	9	10
<b>Total</b>	<b>5</b>	<b>7</b>	<b>7</b>	<b>9</b>	<b>15</b>	<b>27</b>	<b>42</b>	<b>64</b>	<b>72</b>	<b>77</b>

**Table 8: Qualifying Power Capacity (kWe) of CHP schemes using renewable fuels scaled by renewable inputs, 2005 to 2014**  
- CHPQA certified only, excluding STW

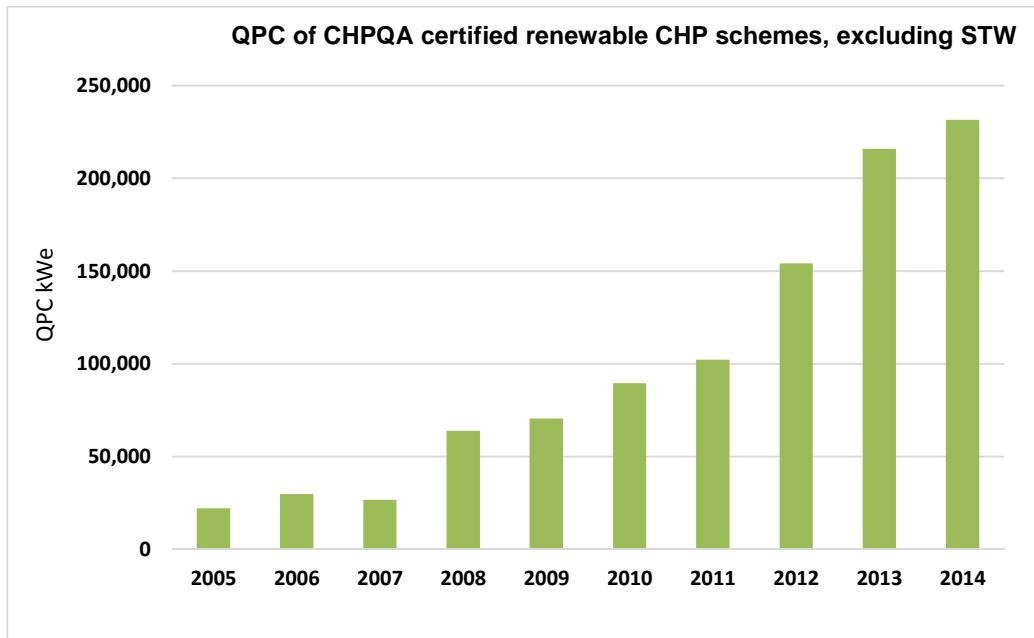
Size range	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
≤ 0.1 MWe	2	26	30	17	256	194	32	253	256	312
> 0.1 to 1 MWe	682	1,428	640	337	733	4,174	7,902	13,769	15,766	15,242
> 1 MWe to 2 MWe	0	0	0	0	0	0	1,415	2,858	1,933	0
> 2 MWe to 10 MWe	9,189	15,106	13,258	8,032	10,929	24,547	32,005	39,859	64,555	80,903
>10 MWe	12,113	13,049	12,583	55,441	58,436	60,695	60,935	97,330	133,506	135,110
<b>Total</b>	<b>21,987</b>	<b>29,610</b>	<b>26,510</b>	<b>63,828</b>	<b>70,354</b>	<b>89,611</b>	<b>102,289</b>	<b>154,070</b>	<b>216,016</b>	<b>231,567</b>

Chart 7 and Chart 8 show the evolution of the number of CHP schemes certified under CHPQA and their capacity. As discussed above, it is growth in these schemes that is the best barometer of the response to the evolving policy incentive environment, as certification under CHPQA is necessary for the benefits associated with policy to be accessed. It is clear that there has been a significant increase in the number of renewable CHP schemes and capacity, starting about 2010. This is significant as it was at this time that the new, beneficial ROCs banding for CHP came into effect. This clearly shows how changes to the RO in 2009 affected the uptake of Good Quality renewable CHP.

**Chart 7 Number of CHPQA certified renewable CHP schemes, excluding STW**



**Chart 8 Capacity of CHPQA certified renewable schemes, excluding STW**



### Summary

The policy incentive landscape relating to renewable CHP has evolved appreciably over the past 10 years. The incentives offered to renewable CHP depend upon type of fuel consumed and capacity, with some types of renewable CHP being incentivised more than others, according to their perceived and actual need for support.

Including schemes at sewage treatment works, the number and total capacity of CHP schemes consuming renewable fuel has increased over the last 10 years by 166 per cent and 253 per cent, respectively.

CHP at STW is established practice over the long term and much less sensitive to policy incentives than other types of scheme. Removing STW from the analysis and concentrating on those schemes that need to be certified under CHPQA in order to access the policy incentives available, the number of renewable CHP schemes and capacity has increased 15-fold and 10-fold, respectively, between 2005 and 2014. There has been a significant increase in scheme numbers and capacity since 2010, following introduction of the beneficial ROC banding for renewable CHP in 2009.

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## **Recent and forthcoming publications of interest to users of energy 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 23 June 2016 at:

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

### **Annual Fuel Poverty statistics report and sub-regional data**

This annual publication details the latest statistics on fuel poverty. The 2016 edition, detailing the 2014 statistics, was published on 30 June 2016, along with a series of detailed data tables, at:

[www.gov.uk/government/collections/fuel-poverty-statistics](http://www.gov.uk/government/collections/fuel-poverty-statistics). Data for 2014 at sub-regional level is available at: [www.gov.uk/government/collections/fuel-poverty-sub-regional-statistics](http://www.gov.uk/government/collections/fuel-poverty-sub-regional-statistics)

### **Local authority carbon dioxide emissions**

This annual publication provides estimates of local authority carbon dioxide emissions in the United Kingdom. Data for 2014 was published on 30 June 2016 at:

[www.gov.uk/government/collections/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics](http://www.gov.uk/government/collections/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics)

### **National Energy Efficiency Data-framework 2016**

This publication presents analysis from the National Energy Efficiency Data-Framework (NEED). It provides updated domestic energy consumption results to include 2014 gas and electricity consumption data. It also includes updated estimates of the impact of installing energy efficiency measures on a household's gas consumption for measures installed in 2013. The latest edition was published on 30 June 2016 at:

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

### **Sub-national road transport consumption**

This annual publication provides estimates of sub-national road transport fuel consumption in the United Kingdom, by vehicle and fuel type. Data for 2014 was published on 30 June 2016 at:

[www.gov.uk/government/collections/road-transport-consumption-at-regional-and-local-level](http://www.gov.uk/government/collections/road-transport-consumption-at-regional-and-local-level)

### **Greenhouse Gas Emissions quarterly statistics**

This publication provides provisional estimates of UK greenhouse gas emissions on a quarterly basis. The latest release covering emissions up to and including the 1st quarter of 2016, was published on 30 June 2016 at:

[www.gov.uk/government/collections/uk-greenhouse-gas-emissions-quarterly-official-statistics](http://www.gov.uk/government/collections/uk-greenhouse-gas-emissions-quarterly-official-statistics)

### **Smart Meters quarterly statistics**

This quarterly 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 March 2016, was published on 30 June 2016 at:

[www.gov.uk/government/collections/smart-meters-statistics](http://www.gov.uk/government/collections/smart-meters-statistics)

### **Digest of United Kingdom Energy Statistics**

This annual publication provides essential information for everyone involved in energy, from economists to environmentalists, and from energy suppliers to energy users. The 2016 edition will be published on 28 July 2016. With extensive tables, charts and commentary covering all the major aspects of energy, it provides a detailed and comprehensive picture of energy production and use over the last 5 years. It will be available (along with additional annexes and key series back to 1970) at: [www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes](http://www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes)

### **UK Energy in Brief**

This annual publication summarises the latest statistics on energy production, consumption, prices and climate change in the United Kingdom. The figures are primarily taken from the Digest of United Kingdom Energy Statistics (see above). The 2016 edition will be published on 28 July 2016 at: [www.gov.uk/government/collections/uk-energy-in-brief](http://www.gov.uk/government/collections/uk-energy-in-brief)

### **Energy Flow Chart**

This annual publication illustrates the flow of primary fuels from home production and imports to their eventual final uses. The flows are shown in their original state and after being converted into different kinds of energy by the secondary fuel producers, and are measured in million tonnes of oil equivalent, with the widths of the bands approximately proportional to the size of the flows they represent. The 2016 edition of the chart, showing the flows for 2015, will be published on 28 July 2016 at: [www.gov.uk/government/collections/energy-flow-charts](http://www.gov.uk/government/collections/energy-flow-charts)

### **Energy Consumption in the United Kingdom**

This annual publication brings together statistics from a variety of sources to produce a comprehensive review of energy consumption and changes in efficiency, intensity and output since the 1970s, with a particular focus on trends since 1990. The information is presented in five sections covering overall energy consumption and energy consumption in the transport, domestic, industrial and service sectors. The 2016 edition will be published on 28 July 2016 at: [www.gov.uk/government/collections/energy-consumption-in-the-uk](http://www.gov.uk/government/collections/energy-consumption-in-the-uk)

### **Sub-national consumption of other fuels, 2014**

This publication presents the findings of the residual fuels sub-national energy consumption analysis in the UK for the period covering 1 January to 31 December 2014. Other fuels are defined as non-gas, non-electricity and non-road transport fuels, and cover consumption of coal, petroleum, manufactured solid fuels and bioenergy and waste not used for electricity generation or road transport. The release will be published on 29 September 2016 at: [www.gov.uk/government/collections/sub-national-consumption-of-other-fuels](http://www.gov.uk/government/collections/sub-national-consumption-of-other-fuels)

### **Sub-national total final energy consumption, 2014**

This factsheet presents the findings of the sub-national energy consumption analysis in the UK for all fuels, for the period covering 1 January to 31 December 2014. The release will be published on 29 September 2016 at: [www.gov.uk/government/collections/total-final-energy-consumption-at-sub-national-level](http://www.gov.uk/government/collections/total-final-energy-consumption-at-sub-national-level)

# Explanatory notes

## General

More detailed notes on the methodology used to compile the figures and data sources are available on the DECC 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 at:  
[www.gov.uk/browse/business/generating-energy/oil-and-gas-exploration-and-production](http://www.gov.uk/browse/business/generating-energy/oil-and-gas-exploration-and-production)

## 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 engine 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

