

## Section 5 - Electricity

### Key results show:

In 2018 Q2, total electricity generated decreased by 0.7 per cent as total demand fell to 82.0 TWh compared to a year earlier. The demand decrease was largely driven by reduced domestic consumption. **(Chart 5.1)**

Renewables' share of electricity generation increased from 30.6 per cent in 2017 Q2 to a record 31.7 per cent in 2018 Q2, due to increased capacity and a 10.9 per cent increase in average daily sun hours. **(Chart 5.2)**

Nuclear's share of generation decreased from 23.1 per cent in the second quarter of 2017 to 21.7 per cent in the second quarter of 2018. This was due to outages at a number of large reactors, reducing available nuclear capacity. **(Chart 5.2)**

Generation from low carbon sources (renewables plus nuclear) provided more than half of generation, dropping 0.3 percentage points to 53.4 per cent compared to the same period last year. The small decrease in low carbon's share of generation was a result of reduced nuclear generation being balanced by increased renewables generation. **(Chart 5.3)**

Coal's share of generation decreased from 2.0 per cent in 2017 Q2 to a record low of 1.6 per cent in 2018 Q2. Gas remained the dominant fuel type with its share of generation increasing to 42.0 per cent. Since 2015 there has been a large-scale switch in generation from coal to gas. **(Chart 5.2)**

The UK remains a net importer with 6.8 per cent of electricity supplied from net imports in the second quarter of 2018. **(Chart 5.4)**

### Relevant tables

5.1: Fuel used in electricity generation and electricity supplied

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5.2: Supply and consumption of electricity

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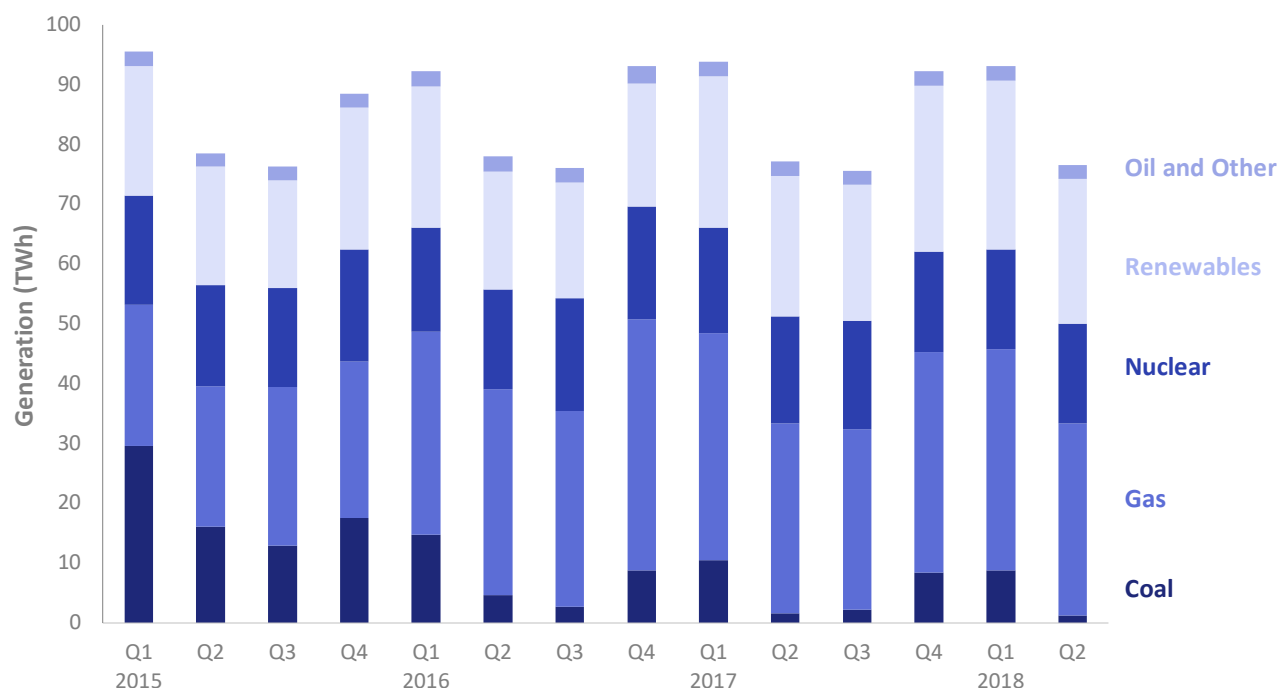
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**Chart 5.1 Electricity generated by fuel type (Table 5.1)**

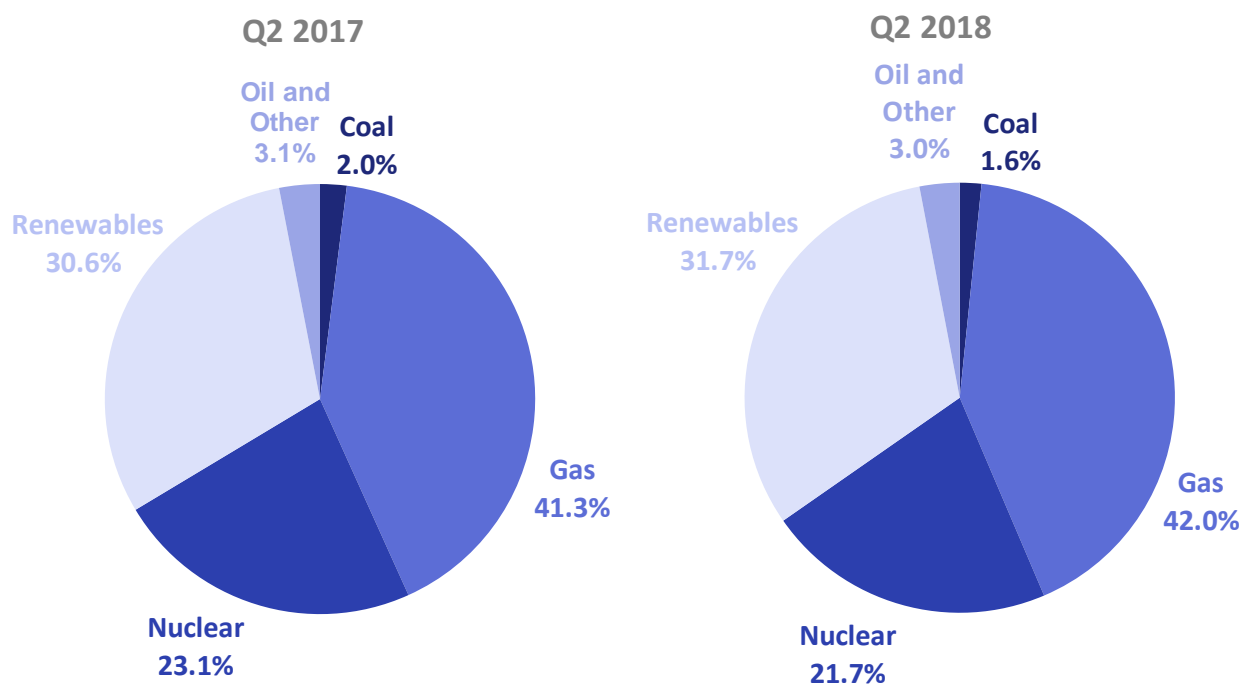
Generation by Major Power Producers (MPPs) decreased by 0.5 per cent compared to 2017 Q2, while generation from other sources decreased by 1.4 per cent. This led to an overall drop of 0.7 per cent in generation, reflecting the reduction in demand. Fossil fuel generation dropped to its lowest level for any previous Q2 (33.7 TWh), while renewable generation increased by 3.0 per cent to 24.3 TWh, a record high for Q2.

Coal fired generation fell by nearly 20 per cent from 1.5 TWh in 2017 Q2 to a new record low of 1.2 TWh in 2018 Q2, as gas generation was favoured over coal. While fuel costs for coal fired generation are lower than for gas, emissions from coal are higher, so generators must pay a greater carbon price per GWh produced. The fall follows the general downward trend in coal fired generation over the last three years.

Nuclear generation decreased by 6.7 per cent from 17.8 TWh in 2017 Q2 to 16.6 TWh in 2018 Q2, due to outages at several large nuclear reactors in Q2 2018. This was offset by rises in gas and bioenergy generation, which increased by 1.0 and 8.8 per cent respectively compared to Q2 2017. The significant increase in bioenergy generation reflects a reduction in the number of outages that affected generation in 2017 Q2.

In 2018 Q2, wind and solar PV generation remained steady at 14.9 TWh (+0.3 per cent on 2017 Q2). However, solar electricity generation reached a record high; MPPs generated 1.3 TWh, an increase of 10.6 per cent on 2017 Q2, due to a 10.9 per cent increase in average daily sun hours for the period - the highest level since Q2 2011. Wind generation remained largely similar compared to Q2 2017 (+0.1 per cent; see Energy Trends table 6.1), as very low wind speeds offset a 15.8 per cent increase in capacity. Hydro generation decreased by 4.5 per cent as rainfall fell 14.6 per cent to its lowest level since Q2 2010.

**Chart 5.2 Shares of electricity generation (Table 5.1)**

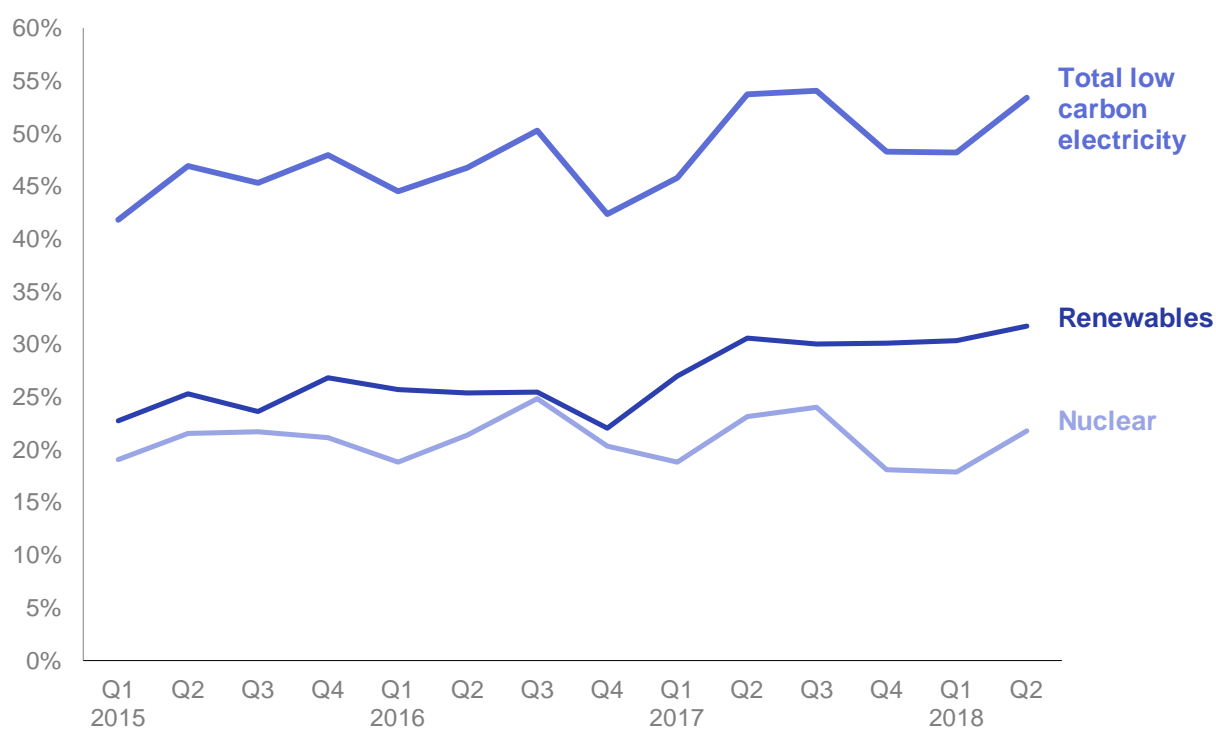


Nuclear's share of generation decreased from 23.1 per cent in the second quarter of 2017 to 21.7 per cent in the second quarter of 2018 following outages at several large reactors, reducing available nuclear capacity. This decrease has caused share increases in all other fuels except coal.

The share of electricity generated from renewables (hydro, wind, bioenergy, solar and other renewables) grew from 30.6 per cent in 2017 Q2 to a record high of 31.7 per cent in 2018 Q2. This was partly due to a 10.9 per cent rise in average daily sun hours to 6.9 hours, the highest level since Q2 2011. Significant increases in capacity also contributed to this, as wind and solar capacity rose by 15.8 and 5.2 per cent, respectively, compared to Q2 2017.

The share of generation from coal decreased from 2.0 per cent in 2017 Q2 to a record low of 1.6 per cent in 2018 Q2. This continues the downward trend in coal generation observed over the past three years.

Gas remains by far the dominant fuel type as its share of generation increased from 41.3 per cent in 2017 Q2 to 42.0 per cent in 2018 Q2, due to the drops in nuclear and coal generation.

**Chart 5.3 Low carbon electricity's share of generation (Table 5.1)**

Low carbon electricity's share of generation was steady compared to Q2 2017, decreasing by 0.3 percentage points to 53.4 per cent in Q2 2018, due to an increase in renewable generation and a drop in nuclear generation.

The share of renewable generation reached a record high at 31.7 per cent, rising 1.1 percentage points from Q2 2017, whilst nuclear electricity's share of generation dropped from 23.1 per cent to 21.7 per cent compared to the same period last year, due to outages.

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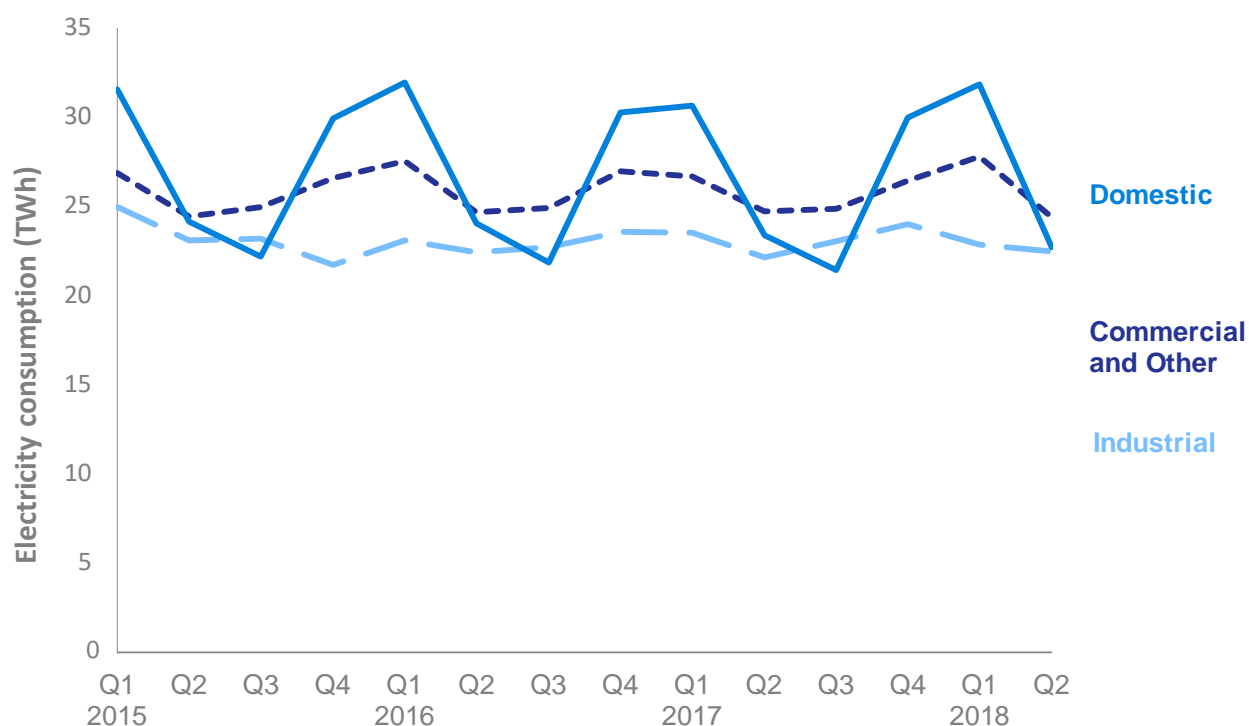
**Chart 5.4 UK trade in electricity (Table 5.6)**



The UK has four interconnectors allowing trade with continental Europe: England-France (2 GW capacity), England-Netherlands (1 GW), Northern Ireland-Ireland (0.6 GW) and Wales-Ireland (0.5 GW).

In 2018 Q2, compared with the same period in 2017, imports of electricity were stable at 5.5 TWh, whilst exports increased by 31.4 per cent (+0.1 TWh). Following two quarters of being a net exporter in 2009 Q4 and 2010 Q1, the UK has remained a net importer in each quarter since.

Net imports of electricity dropped by 1.3 per cent to 5.2 TWh in 2018 Q2. Net imports accounted for 6.8 per cent of the total electricity supplied in 2018 Q2, remaining stable from the same period last year.

**Chart 5.5 Electricity final consumption (Table 5.2)**

Final consumption of electricity fell by 1.0 per cent in 2018 Q2, from 70.2 TWh in 2017 Q2, to 69.5 TWh.

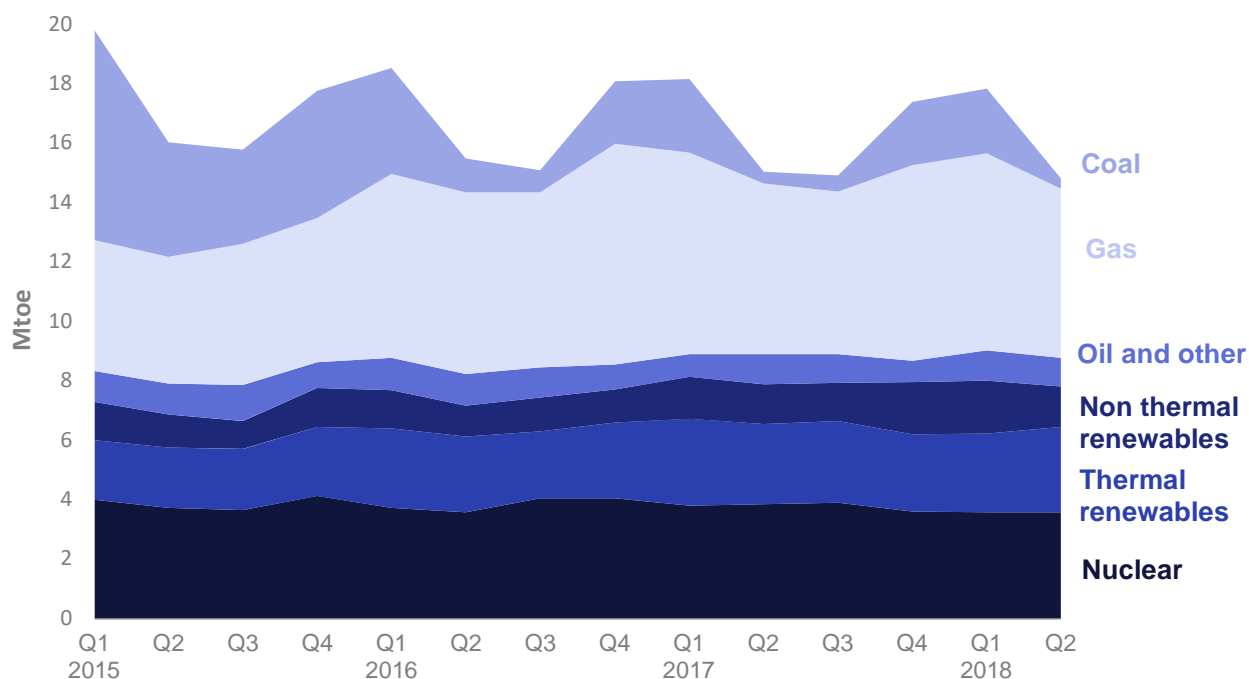
Domestic use fell by 2.9 per cent to a record low for Q2, from 23.4 TWh to 22.7 TWh, due to an increase in the average temperature compared to the same period in the previous year, as well as the positive impact of improved energy efficiency measures. Average temperatures increased by 1.3 per cent from 12.6 degrees Celsius in Q2 2017 to 12.8 degrees Celsius in the same period in 2018 – see Energy Trends table 7.1 at:

[www.gov.uk/government/statistics/energy-trends-section-7-weather](http://www.gov.uk/government/statistics/energy-trends-section-7-weather).

Industrial use of electricity, including iron and steel, increased by 1.5 per cent, to 22.5 TWh, whilst consumption by commercial and other users decreased by 1.4 per cent to 23.2 TWh.

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**Chart 5.6 Fuel used for electricity generation (Table 5.1)**



Fuel used by generators in 2018 Q2 fell by 1.5 per cent, from 15.0 mtoe in 2017 Q2 to 14.8 mtoe. A large reduction in coal usage contributed to this fall, though it was also caused by the continuing shift of the fuel mix to more efficient non-thermal renewables (note that for primary renewable sources, such as wind and solar, the fuel used is assumed the same as the electricity generated, unlike thermal generation where conversion losses are incurred).

In 2018 Q2, coal use was 17.4 per cent lower than a year earlier, reaching a new record low. Meanwhile, gas use was more stable, dropping by 0.5 per cent. This led to a 1.9 per cent decrease in fossil fuel use, though this still represents 41.4 per cent of total fuel use (including net imports). Nuclear use was 6.7 per cent lower than in Q2, 2017 due to outages at several large reactors. Renewable use (hydro, wind and solar and bioenergy) in 2018 Q2 was 4.3 per cent higher than in Q2 2017 and accounted for 28.5 per cent of all fuel used, compared to 27.0 per cent in the previous year.

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Table 5.1. Fuel used in electricity generation and electricity supplied

	2016	2017	per cent change	2016 2nd quarter	2016 3rd quarter	2016 4th quarter	2017 1st quarter	2017 2nd quarter	2017 3rd quarter	2017 4th quarter	2018 1st quarter	2018 2nd quarter	per cent change <sup>1</sup>
<b>FUEL USED IN GENERATION</b>													
<b>All generating companies</b>													
<b>Million tonnes of oil equivalent</b>													
Coal	7.54	5.55	-26.3	1.13	0.74	2.09	2.49	0.41	0.55	2.11	2.17r	0.33	-17.4
Oil	0.58	0.49	-15.9	0.15	0.16	0.16	0.10	0.10	0.14	0.15	0.11	0.08	-18.7
Gas	25.61	24.59	-4.0	6.13	5.88	7.43	6.78	5.74	5.47	6.60	6.64	5.71	-0.5
Nuclear	15.41	15.12	-1.9	3.58	4.05	4.06	3.79	3.83	3.91	3.59	3.58	3.58	-6.7
Hydro	0.48	0.51	+5.5	0.08	0.10	0.11	0.16	0.08	0.11	0.16	0.12	0.07	-4.5
Wind and Solar <sup>2</sup>	4.10	5.29	+29.1	0.96	1.03	1.00	1.25	1.27	1.17	1.60	1.67r	1.28	+0.3
Bioenergy <sup>3</sup>	10.00	10.96	+9.6	2.54	2.25	2.55	2.93	2.70	2.73	2.60	2.64r	2.88	+6.4
Other fuels	1.90	1.69	-10.9	0.45	0.45	0.54	0.44	0.44	0.38	0.43	0.43	0.43	-2.9
Net imports	1.53	1.27	-16.8	0.46	0.41	0.14	0.22	0.45	0.46	0.14	0.46	0.45	-1.3
<b>Total all generating companies</b>	<b>67.15</b>	<b>65.49</b>	<b>-2.5</b>	<b>15.48</b>	<b>15.08</b>	<b>18.07</b>	<b>18.16</b>	<b>15.03</b>	<b>14.92</b>	<b>17.37</b>	<b>17.83r</b>	<b>14.81</b>	<b>-1.5</b>
<b>ELECTRICITY GENERATED</b>													
<b>All generating companies</b>													
<b>TWh</b>													
Coal	30.67	22.53	-26.5	4.58	2.71	8.69	10.43	1.54	2.16	8.40	8.79r	1.24	-19.5
Oil	1.89	1.62r	-14.3	0.56	0.45	0.54	0.37	0.36	0.46	0.43	0.43r	0.28	-21.4
Gas	143.13	136.83r	-4.4	34.44	32.63	42.06	37.94	31.80	30.18	36.90r	36.93r	32.13	+1.0
Nuclear	71.73	70.34	-1.9	16.66	18.86	18.87	17.64	17.83	18.17	16.69	16.64	16.63	-6.7
Hydro (natural flow)	5.62	5.93	+5.5	0.98	1.20	1.26	1.90	0.91	1.32	1.80	1.39r	0.87	-4.5
Wind and Solar <sup>2</sup>	47.67	61.53	+29.1	11.12	11.93	11.63	14.50	14.80	13.59	18.64	19.39r	14.85	+0.3
- of which, Offshore <sup>6</sup>	16.41	20.96r	+27.8	3.25	3.58	4.42	5.17	3.99	3.96	7.84r	7.97r	4.75	+19.0
Bioenergy <sup>3</sup>	30.06	31.87	+6.0	7.71	6.22	7.61	8.92	7.84	7.78	7.33	7.46r	8.53	+8.8
Pumped Storage	2.96	2.87	-2.9	0.69	0.69	0.82	0.79	0.69	0.64	0.75	0.75	0.66	-5.2
Other fuels	5.57	5.13r	-7.9	1.30	1.34	1.53	1.29	1.30	1.30	1.24r	1.35r	1.36	+4.6
<b>Total all generating companies</b>	<b>339.30</b>	<b>338.65</b>	<b>-0.2</b>	<b>78.02</b>	<b>76.05</b>	<b>93.01</b>	<b>93.79</b>	<b>77.08</b>	<b>75.60</b>	<b>92.18</b>	<b>93.13r</b>	<b>76.55</b>	<b>-0.7</b>
<b>SHARES OF ELECTRICITY GENERATED</b>													
<b>All generating companies</b>													
Coal	9.0%	6.7%		5.9%	3.6%	9.3%	11.1%	2.0%	2.9%	9.1%	9.4%	1.6%	
Oil	0.6%	0.5%		0.7%	0.6%	0.6%	0.4%	0.5%	0.6%	0.5%	0.5%	0.4%	
Gas	42.2%	40.4%		44.1%	42.9%	45.2%	40.5%	41.3%	39.9%	40.0%	39.7%	42.0%	
Nuclear	21.1%	20.8%		21.4%	24.8%	20.3%	18.8%	23.1%	24.0%	18.1%	17.9%	21.7%	
Hydro (natural flow)	1.7%	1.8%		1.3%	1.6%	1.4%	2.0%	1.2%	1.7%	2.0%	1.5%	1.1%	
Wind and Solar <sup>2</sup>	14.1%	18.2%		14.2%	15.7%	12.5%	15.5%	19.2%	18.0%	20.2%	20.8%	19.4%	
- of which, Offshore <sup>6</sup>	4.8%	6.2%		4.2%	4.7%	4.8%	5.5%	5.2%	5.2%	8.5%	8.6%	6.2%	
Bioenergy <sup>3</sup>	8.9%	9.4%		9.9%	8.2%	8.2%	9.5%	10.2%	10.3%	7.9%	8.0%	11.1%	
Pumped Storage	0.9%	0.8%		0.9%	0.9%	0.9%	0.8%	0.9%	0.8%	0.8%	0.8%	0.9%	
Other fuels	1.6%	1.5%		1.7%	1.8%	1.6%	1.4%	1.7%	1.7%	1.3%	1.4%	1.8%	
<b>Total all generating companies</b>	<b>100%</b>	<b>100%</b>		<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	
<b>Renewable generation share</b>	<b>24.6%</b>	<b>29.3%</b>		<b>25.4%</b>	<b>25.5%</b>	<b>22.0%</b>	<b>27.0%</b>	<b>30.6%</b>	<b>30.0%</b>	<b>30.1%</b>	<b>30.3%</b>	<b>31.7%</b>	
<b>Low carbon generation share</b>	<b>45.7%</b>	<b>50.1%</b>		<b>46.7%</b>	<b>50.2%</b>	<b>42.3%</b>	<b>45.8%</b>	<b>53.7%</b>	<b>54.0%</b>	<b>48.2%</b>	<b>48.2%</b>	<b>53.4%</b>	
<b>ELECTRICITY SUPPLIED<sup>4</sup></b>													
<b>All generating companies</b>													
<b>TWh</b>													
Coal	29.10	21.37	-26.5	4.34	2.57	8.25	9.90	1.46	2.05	7.97	8.34r	1.18	-19.5
Oil	1.71	1.48	-13.7	0.51	0.41	0.49	0.34	0.33	0.42	0.39	0.39r	0.26	-20.8
Gas	140.61	134.24	-4.5	33.82	32.04	41.30	37.25	31.22	29.62	36.15	36.26r	31.53	+1.0
Nuclear	65.15	63.89	-1.9	15.13	17.13	17.14	16.03	16.20	16.51	15.16	15.12	15.10	-6.7
Hydro	5.56	5.86	+5.4	0.97	1.19	1.25	1.88	0.90	1.30	1.79	1.38r	0.86	-4.1
Wind and Solar <sup>2</sup>	47.67	61.53	+29.1	11.12	11.93	11.63	14.50	14.80	13.59	18.64	18.93r	13.55	-8.5
- of which, Offshore <sup>6</sup>	16.41	20.96r	+27.8	3.25	3.58	4.42	5.17	3.99	3.96	7.84r	7.92r	4.72	+18.3
Bioenergy <sup>3</sup>	26.18	27.14	+3.7	6.72	5.38	6.62	7.64	6.67	6.61	6.21	6.32r	7.28	+9.2
Pumped Storage (net supply) <sup>5</sup>	-1.07	-1.00	-6.4	-0.26	-0.23	-0.30	-0.29	-0.25	-0.21	-0.25	-0.27	-0.27	+9.4
Other fuels	5.18	4.78	-7.6	1.20	1.25	1.43	1.18	1.19	1.19	1.22	0.94r	0.98	-17.9
Net imports	17.75	14.76	-16.8	5.36	4.74	1.61	2.61	5.25	5.30	1.60	5.38	5.18	-1.3
<b>Total all generating companies</b>	<b>337.83</b>	<b>334.06</b>	<b>-1.1</b>	<b>78.91</b>	<b>76.42</b>	<b>89.41</b>	<b>91.03</b>	<b>77.78</b>	<b>76.38</b>	<b>88.86</b>	<b>92.79r</b>	<b>75.66</b>	<b>-2.7</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



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Table 5.2 Supply and consumption of electricity

	<i>GWh</i>												
	2016	2017	<i>Per cent change</i>	2016 2nd quarter	2016 3rd quarter	2016 4th quarter	2017 1st quarter	2017 2nd quarter	2017 3rd quarter	2017 4th quarter	2018 1st quarter	2018 2nd quarter	<i>Per cent change<sup>1</sup></i>
<b>SUPPLY</b>													
Indigenous production	339,301	338,649	-0.2	78,021	76,051	93,013	93,790	77,080	75,598	92,181	93,127r	76,545	-0.7
Major power producers <sup>2,3</sup>	289,984	284,924	-1.7	65,442	63,037	80,965	80,771	63,040	61,864	79,249	79,756r	62,728	-0.5
Auto producers	46,358	50,853	+9.7	11,890	12,322	11,233	12,228	13,346	13,097	12,181	12,625r	13,159	-1.4
Other sources <sup>4</sup>	2,959	2,872	-2.9	689	693	815	791	694	636	751	746	658	-5.2
Imports	20,018	18,167	-9.2	5,676	5,028	2,912	3,517	5,476	5,505	3,669	5,832	5,479	+0.1
Exports	2,273	3,407	+49.9	319	283	1,305	910	226	203	2,068	456	297	+31.4
Transfers	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total supply</b>	357,046	353,409	-1.0	83,378	80,796	94,621	96,397	82,330	80,899	93,783	98,503r	81,727	-0.7
Statistical difference	522	429	-	31	162	207	-221	-198	-367	356	104r	257	-
<b>Total demand</b>	356,524	353,838	-0.8	83,348	80,634	94,414	96,618	82,527	81,266	93,427	98,399r	81,984	-0.7
<b>TRANSFORMATION</b>													
Energy industry use <sup>5</sup>	26,633	26,613	-0.1	6,297	6,273	7,091	7,128	6,396	6,365	6,725	6,900r	6,425	+0.5
Losses	26,096	26,554	+1.8	5,965	4,928	6,566	8,723	5,905	5,604	6,323	9,043r	6,018	+1.9
<b>FINAL CONSUMPTION</b>													
Iron & steel	2,847	2,677	-6.0	703	707	730	682	670	653	671	668	663	-1.1
Other industries	88,961	89,969	+1.1	21,728	22,000	22,845	22,808	21,459	22,389	23,313	22,185r	21,793	+1.6
Transport	4,686	4,783	+2.1	1,171	1,171	1,171	1,196	1,196	1,196	1,196	1,196	1,196	-
Domestic	107,971	105,396	-2.4	24,014	21,831	30,222	30,629	23,384	21,423	29,960	31,813r	22,703	-2.9
Other final users	99,331	97,846	-1.5	23,470	23,725	25,788	25,452	23,518	23,636	25,240	26,595r	23,186	-1.4
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 2017 they were:

AES Electric Ltd., Anesco Ltd., Acquisintionco, 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., Ferrybridge Multifuel Energy Limited, 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., REG BlackRock, 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., Viridor Waste Management Ltd., Xceco

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

4. Gross supply from pumped storage hydro.

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