Section 5 - Electricity

Key results show:

In 2017 Q2, total electricity generated fell by 3.3 per cent to 75.5 TWh compared to a year earlier. Temperatures were 1.1 degrees higher than in 2016 Q2. (**Chart 5.1**)

For only the second time in the UK, generation from low carbon sources (renewables plus nuclear) provided more than half of generation, with a record of 53.4 per cent compared to 46.7 per cent in the same period last year. **(Chart 5.3)**

Renewables' share of electricity generation increased from 25.3 per cent in 2016 Q2 to a record 29.8 per cent in 2017 Q2 due to increased capacity and better weather conditions. **(Chart 5.2)**

Nuclear's share of generation increased from 21.3 per cent in the second quarter of 2016 to 23.6 per cent in the second quarter of 2017. This was due to fewer days being lost to outages, with no change in capacity. **(Chart 5.2)**

Coal's share of generation decreased from 5.9 per cent in 2016 Q2 to a record low of 2.1 per cent in 2017 Q2, whilst gas' share of generation decreased slightly from 44.2 per cent to 41.3 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 6.9 per cent of electricity supplied from net imports in the second quarter of 2017. (**Chart 5.4)**

Relevant tables

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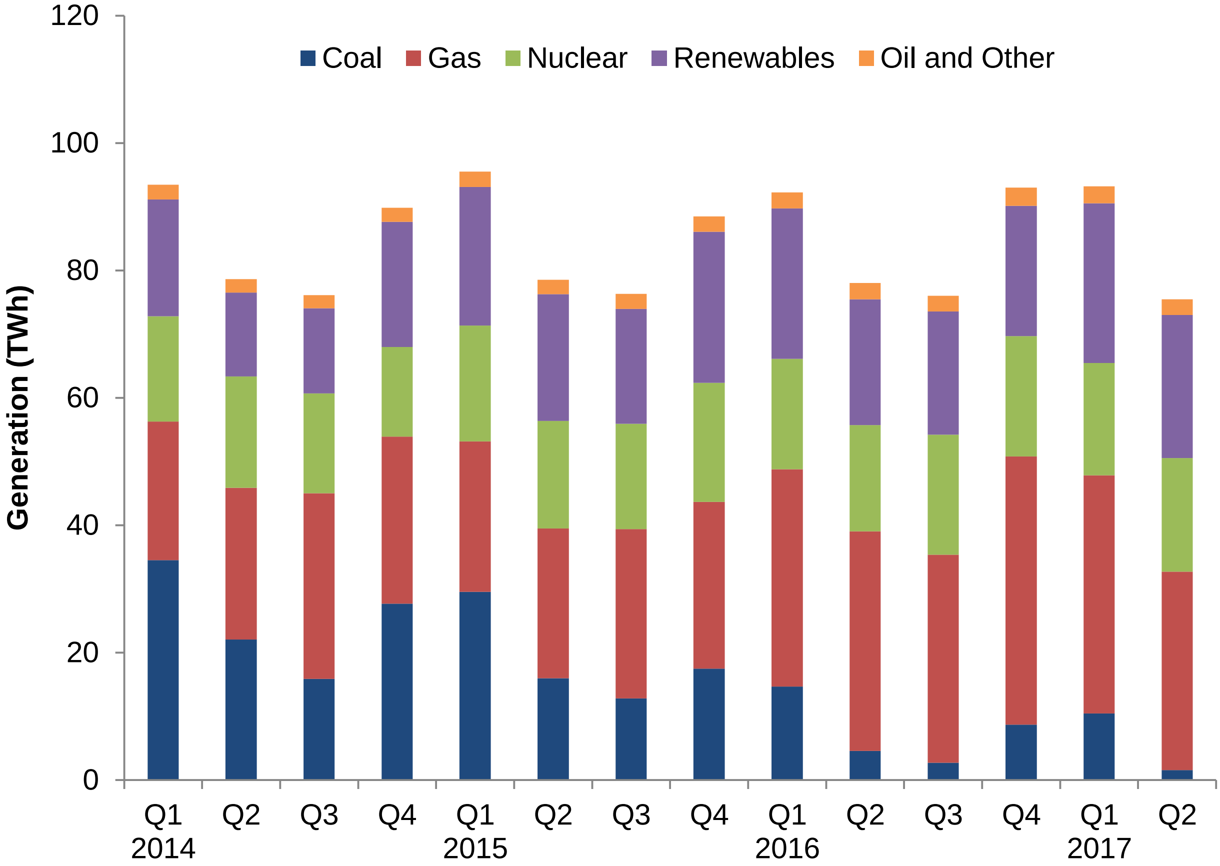
Chart 5.1 Electricity generated by fuel type (Table 5.1)



Generation by Major Power Producers (MPPs) fell by 3.6 per cent whilst generation from other sources fell by 1.4 per cent. This led to an overall drop of 3.3 per cent in generation compared to Q2 last year as demand fell with warmer temperatures. Fossil fuel generation fell 16 per cent whilst low carbon generation increased 11 per cent to a record high 40.3 TWh. By fuel type:

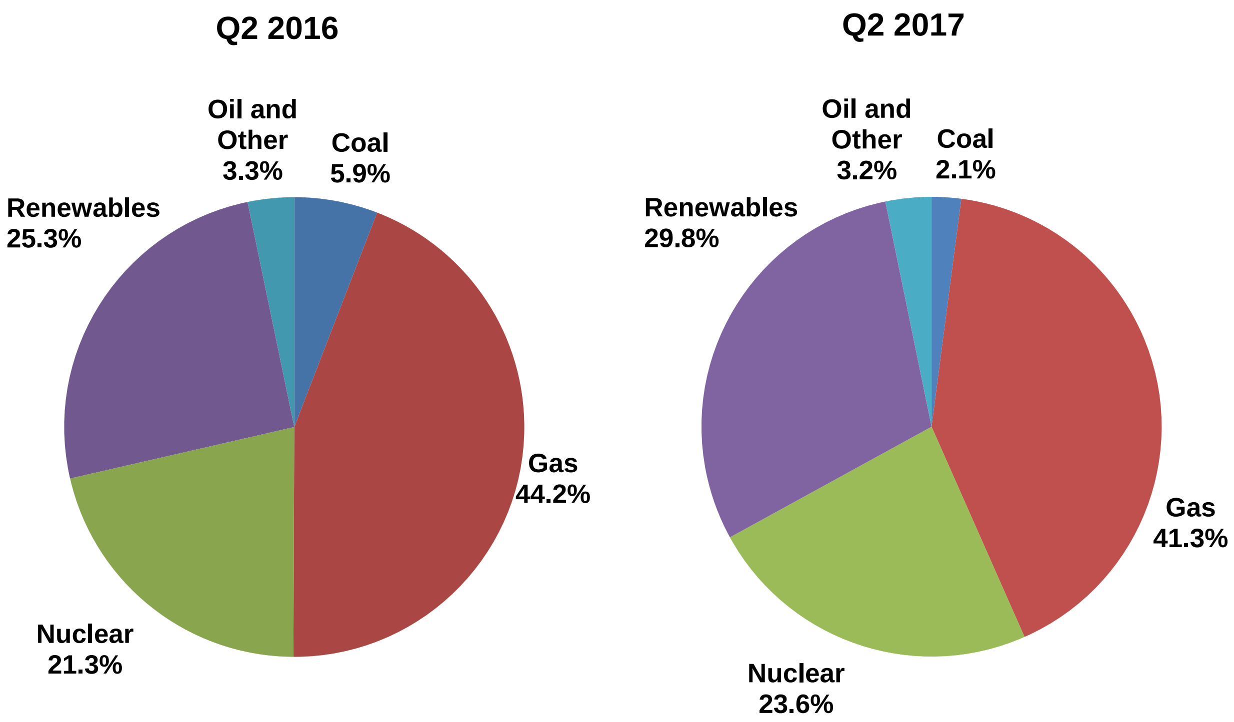
Coal fired generation fell by 66 per cent from 4.6 TWh in 2016 Q2 to 1.6 TWh in 2017 Q2, due to gas generation being favoured over coal. Whilst fuel costs for coal fired generation are lower than for gas, emissions from coal are higher so generators must pay a greater carbon price per GWh produced. The fall follows the general downward trend in coal fired generation over the last three years.

Gas fired generation decreased 9.6 per cent compared to Q2 2016, down 3.3 TWh to 31.2 TWh.

Nuclear generation increased by 7.1 per cent from 16.7 TWh in 2016 Q2 to 17.8 TWh in 2017 Q2.

In 2017 Q2 wind and PV generation increased by 25.6 per cent from 11.1 TWh to 14.0 TWh. Wind generation was up by 37 per cent (+2.7 TWh) compared with a year ago, due to an 8.3 per cent increase in average wind speed, and a 21 per cent increase in capacity. Solar generation increased by 3.4 per cent (+0.1 TWh), due to a 17.1 per cent increase in average daily sun hours, and an 8.9 per cent increase in capacity. Hydro generation decreased by 12.5 per cent (-0.1 TWh) partly due to a 1.9 per cent decrease in rainfall compared with a year earlier.

Chart 5.2 Shares of electricity generation (Table 5.1)



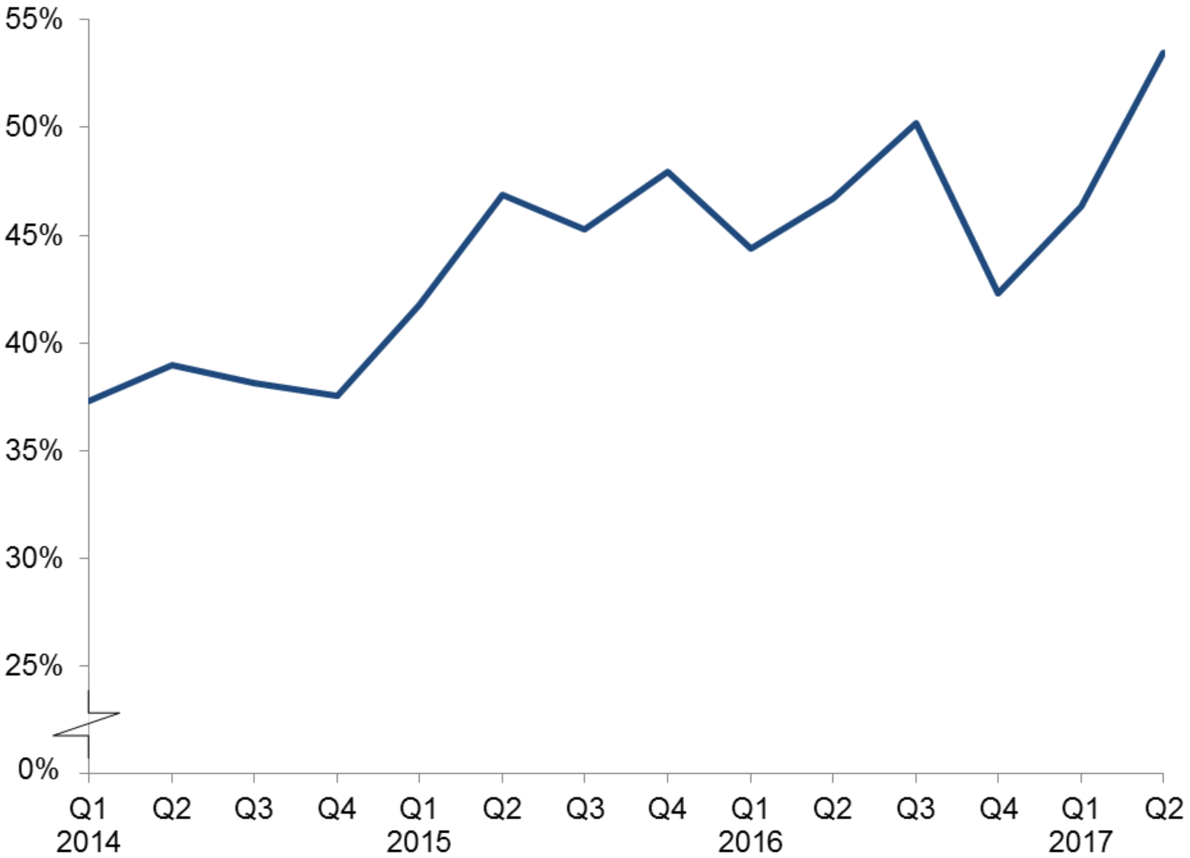
The share of electricity generated from renewables (hydro, wind and other renewables) grew from 25.3 per cent in 2016 Q2 to a record 29.8 per cent in 2017 Q2. This was due to a rise of 0.6 knots in the average wind speeds and a 0.9 hours per day rise in average daily sun hours. Wind and solar activity also increased due to an increase in capacity over the period of 21% wind capacity and 8.9% solar.

Nuclear's share of generation increased from 21.3 per cent in the second quarter of 2016 to 23.6 per cent in the second quarter of 2017 following fewer outages.

The share of generation from coal decreased from 5.9 per cent in 2016 Q2 to a record low of 2.1 per cent in 2017 Q2.

Gas' share of generation decreased from 44.2 per cent in 2016 Q2 to 41.3 per cent in 2017 Q2 as favourable weather conditions for renewable generation displaced gas.

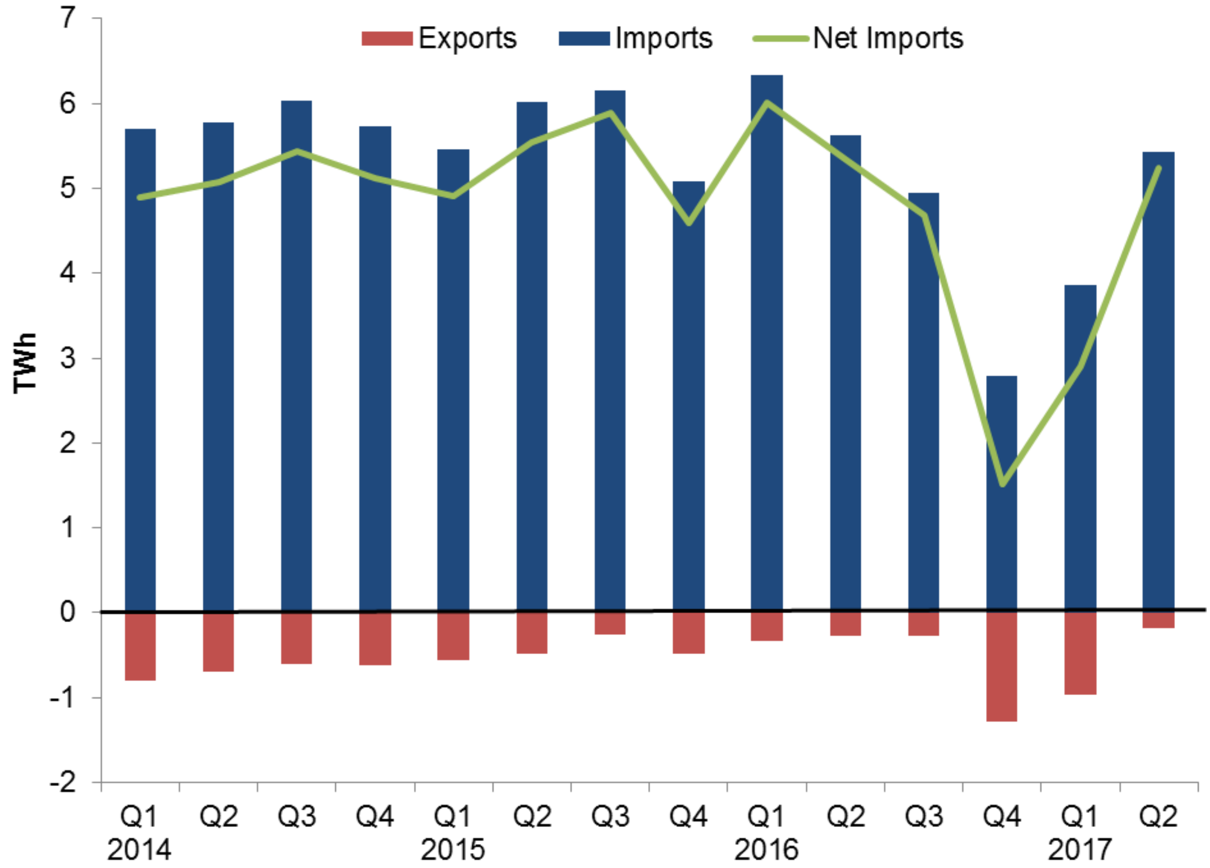
Chart 5.3 Low carbon electricity's share of generation (Table 5.1)



Continuing the general upward trend in low carbon electricity's share of generation, the share increased from 46.7 per cent in 2016 Q2 to 53.4 per cent in 2017 Q2, due to increases in both renewable and nuclear generation.

This is the highest ever low carbon share of electricity generation in the UK, and shows the growing adoption of renewable technology in the UK.

Chart 5.4 UK trade in electricity (Table 5.6)

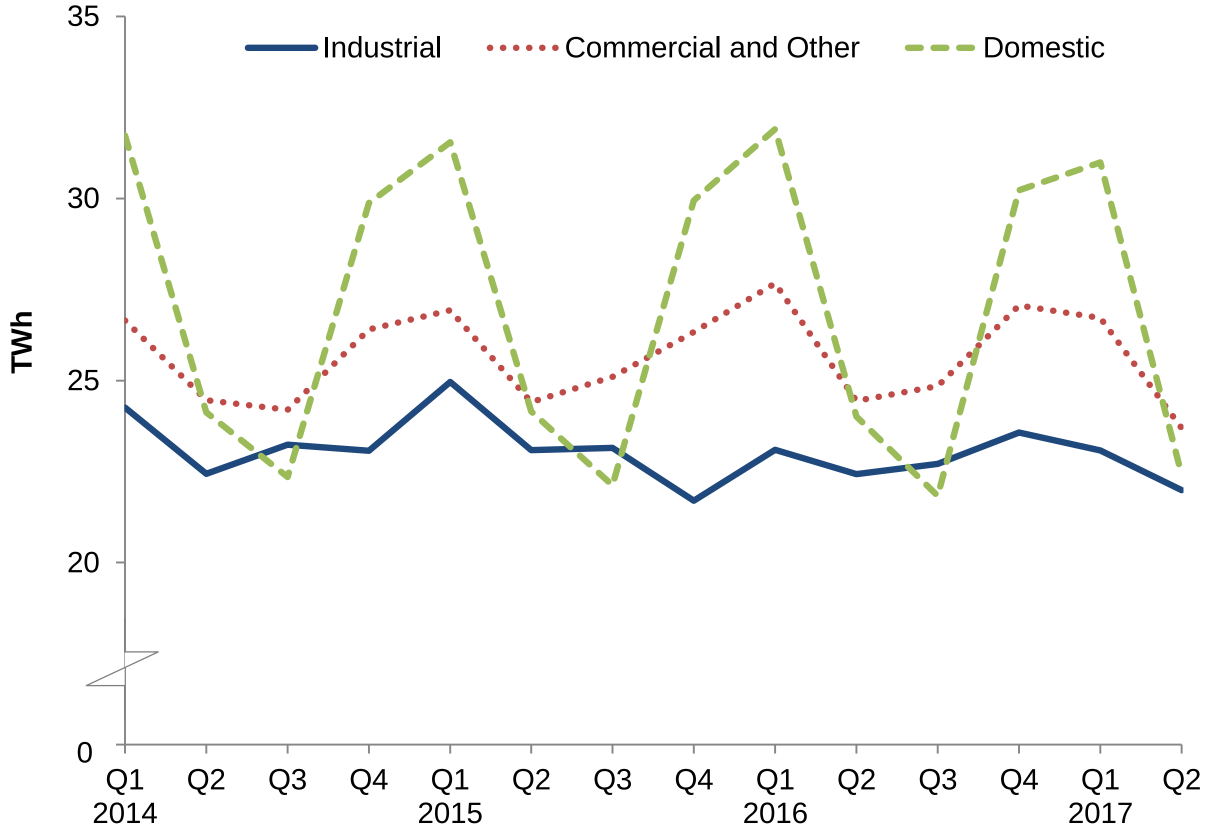


The UK has four interconnectors allowing trade with continental Europe: England-France (2 GW capacity), England-Netherlands (1 GW), Northern Ireland-Ireland (0.6 GW) and Wales-Ireland (0.5 GW).

In 2017 Q2, compared with the same period in 2016, imports of electricity fell by 3.5 per cent (-0.2 TWh), whilst exports fell by 35 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 1.9 per cent from 5.35 TWh in 2016 Q2 to 5.24 TWh in 2017 Q2. Net imports represented 6.9 per cent of electricity supplied in 2017 Q2, up 0.1 percentage points from the same time last year.

Chart 5.5 Electricity final consumption (Table 5.2)

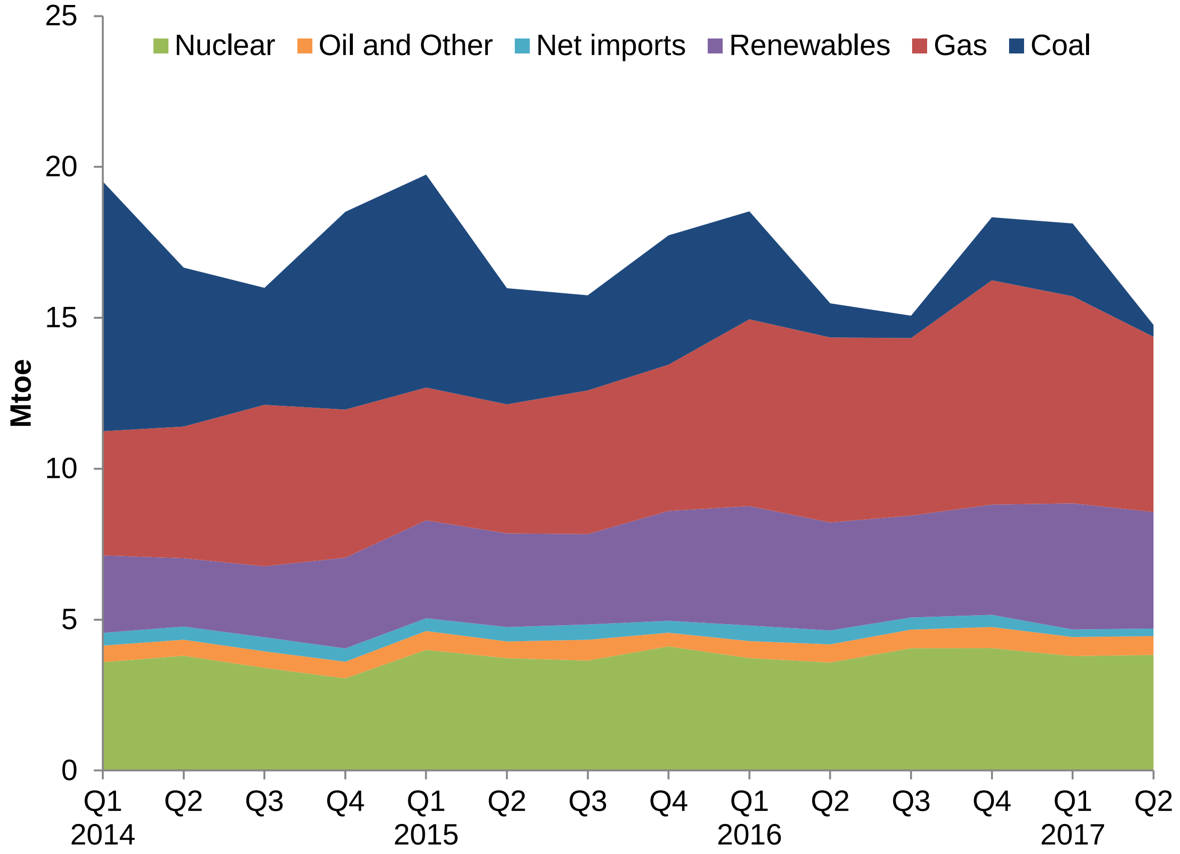


Final consumption of electricity fell by 3.9 per cent in 2017 Q2, from 70.9 TWh in 2015 Q2, to 68.1 TWh.

Domestic use fell by 6.6 per cent, from 24.0 TWh to 22.4 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. Temperatures were on average 1.1 degrees higher than in 2016 Q2 – see Energy Trends table 7.1 at:
www.gov.uk/government/statistics/energy-trends-section-7-weather.

Industrial use of electricity, including iron and steel, fell by 2.0 per cent, from 22.4 TWh to 22.0 TWh, and consumption by commercial and other users decreased by 3.0 per cent, from 24.4 TWh to 23.7 TWh.

Chart 5.6 Fuel used for electricity generation (Table 5.1)



Fuel used by generators in 2017 Q2 fell by 4.6 per cent, from 15.5 mtoe in 2016 Q2 to 14.8 mtoe in 2017 Q2 (note that *for wind (and other primary renewable sources), the fuel used is assumed the same as the electricity generated, unlike thermal generation where conversion losses are incurred).*

In 2017 Q2, gas use was 5.3 per cent lower than in 2016 Q2. Coal use during the quarter was 65 per cent lower than a year earlier, and nuclear sources were 7.1 per cent higher. Renewables (hydro, wind, solar and thermal renewables) accounted for 26.2 per cent of all fuel used (including net imports).

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Table 5.1. Fuel used in electricity generation and electricity supplied

	2015	2016	*per cent change*	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter	2016 2nd quarter	2016 3rd quarter	2016 4th quarter	2017 1st quarter	2017 2nd quarter p	*per cent change* [1]
FUEL USED IN GENERATION													
All generating companies												**Million tonnes of oil equivalent**	
Coal	18.34	7.54	*-58.9*	3.85	3.15	4.28	3.58	1.13	0.74	2.09	2.41r	0.40	*-65.0*
Oil	0.61	0.58	*-3.6*	0.13	0.17	0.17	0.11	0.15	0.16	0.16	0.18	0.16	*+8.4*
Gas	18.28	25.63	*+40.2*	4.28	4.76	4.85	6.19	6.13	5.88	7.43	6.86r	5.80	*-5.3*
Nuclear	15.48	15.41	*-0.4*	3.72	3.64	4.11	3.73	3.58	4.05	4.06	3.79	3.83	*+7.1*
Hydro	0.54	0.46	*-14.4*	0.12	0.09	0.16	0.18	0.08	0.10	0.10	0.15	0.07	*-12.5*
Wind and Solar [2]	4.12	4.11	*-0.2*	0.98	0.85	1.18	1.12	0.96	1.03	1.00	1.25r	1.20	*+25.6*
Bioenergy [3]	8.32	9.99	*+20.0*	1.99	2.05	2.31	2.66	2.54	2.25	2.55	2.77r	2.59	*+2.0*
Other fuels	1.71	1.90	*+10.7*	0.43	0.51	0.28	0.46	0.45	0.45	0.54	0.45	0.46	*+1.6*
Net imports	1.80	1.78	*-1.1*	0.48	0.51	0.40	0.52	0.46	0.40	0.40	0.25	0.25	*-45.7*
Total all generating companies	69.20	67.41	*-2.6*	15.98	15.75	17.73	18.53	15.48	15.07	18.33	18.13r	14.77	*-4.6*
ELECTRICITY GENERATED													
All generating companies												**TWh**	
Coal	75.88	30.71	*-59.5*	16.01	12.83	17.48	14.69	4.58	2.72	8.72	10.49r	1.56	*-66.0*
Oil	2.04	1.84	*-9.7*	0.42	0.54	0.55	0.34	0.56	0.44	0.50	0.55r	0.32	*-42.0*
Gas	99.88	143.36	*+43.5*	23.48	26.56	26.20	34.11	34.49	32.67	42.10	37.38r	31.18	*-9.6*
Nuclear	70.34	71.73	*+2.0*	16.92	16.56	18.69	17.34	16.66	18.86	18.87	17.64	17.83	*+7.1*
Hydro (natural flow)	6.30	5.39	*-14.4*	1.43	1.03	1.83	2.09	0.94	1.15	1.21	1.79r	0.82	*-12.5*
Wind and Solar [2]	47.86	47.79	*-0.2*	11.45	9.93	13.69	13.02	11.13	11.96	11.67	14.59r	13.99	*+25.6*
- of which, Offshore [6]	17.42	16.41	*-5.8*	3.58	3.41	5.76	5.15	3.25	3.58	4.42	5.18r	3.98	*+22.4*
Bioenergy [3]	29.24	30.04	*+2.7*	7.01	7.06	8.22	8.52	7.70	6.22	7.60	8.65	7.66	*-0.5*
Pumped Storage	2.74	2.96	*+8.0*	0.65	0.65	0.71	0.76	0.69	0.69	0.82	0.79	0.69	*+0.7*
Other fuels	4.64	5.57	*+20.2*	1.16	1.17	1.11	1.40	1.30	1.34	1.53	1.35r	1.41	*+9.1*
Total all generating companies	338.92	339.40	*+0.1*	78.53	76.34	88.49	92.27	78.04	76.06	93.03	93.23r	75.46	*-3.3*
ELECTRICITY SUPPLIED [4]													
All generating companies												**TWh**	
Coal	71.99	29.14	*-59.5*	15.19	12.17	16.58	13.94	4.34	2.58	8.28	9.95r	1.48	*-66.0*
Oil	1.85	1.67	*-9.7*	0.38	0.49	0.50	0.30	0.51	0.40	0.46	0.51r	0.30	*-41.3*
Gas	98.00	140.84	*+43.7*	23.02	26.06	25.73	33.56	33.87	32.07	41.34	36.71r	30.62	*-9.6*
Nuclear	63.89	65.15	*+2.0*	15.37	15.04	16.98	15.75	15.13	17.13	17.14	16.03	16.20	*+7.1*
Hydro	6.25	5.35	*-14.4*	1.41	1.02	1.82	2.07	0.93	1.14	1.20	1.78r	0.81	*-12.6*
Wind and Solar [2]	47.87	47.79	*-0.2*	11.45	9.93	13.69	13.02	11.13	11.96	11.67	14.59r	13.99	*+25.6*
- of which, Offshore [6]	17.42	16.41	*-5.8*	3.58	3.41	5.76	5.15	3.25	3.58	4.42	5.18r	3.98	*+22.4*
Bioenergy [3]	25.38	26.02	*+2.5*	6.08	6.12	7.15	7.41	6.69	5.34	6.58	7.56r	6.66	*-0.4*
Pumped Storage (net supply) [5]	-0.98	-1.07	*+8.6*	-0.23	-0.25	-0.25	-0.27	-0.26	-0.23	-0.30	-0.29	-0.25	*-5.2*
Other fuels	4.30	5.16	*+20.1*	1.07	1.09	1.03	1.30	1.20	1.25	1.42	1.25r	1.31	*+9.1*
Net imports	20.94	17.55	*-16.2*	5.54	5.89	4.60	6.00	5.35	4.68	1.51	2.90	5.24	*-1.9*
Total all generating companies	339.49	337.59	*-0.6*	79.29	77.57	87.83	93.08	78.88	76.33	89.30	90.97r	76.35	*-3.2*

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

GWh

	2015	2016	*Per cent change*	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter	2016 2nd quarter	2016 3rd quarter	2016 4th quarter	2017 1st quarter	2017 2nd quarter p	*Per cent change* [1]
SUPPLY													
Indigenous production	338,917	339,398	*+0.1*	78,533	76,337	88,489	92,267	78,039	76,062	93,029	93,233r	75,463	*-3.3*
Major power producers [2 3]	293,251	289,985	*-1.1*	66,645	64,903	77,438	80,565	65,450	63,025	80,945	80,924r	63,040	*-3.7*
Auto producers	42,926	46,453	*+8.2*	11,238	10,780	10,337	10,940	11,900	12,345	11,268	11,517r	11,730	*-1.4*
Other sources [4]	2,739	2,959	*+8.0*	650	653	714	762	689	693	815	791	694	*+0.7*
Imports	22,716	19,699	*-13.3*	6,023	6,152	5,080	6,334	5,622	4,951	2,792	3,863	5,423	*-3.5*
Exports	1,778	2,153	*+21.1*	484	259	480	331	275	268	1,279	960	179	*-35.0*
Transfers	-	-		-	-	-	-	-	-	-	-	-	
Total supply	359,855	356,943	*-0.8*	84,072	82,230	93,088	98,271	83,386	80,745	94,543	96,135r	80,707	*-3.2*
Statistical difference	1,192	194		307	193	455	-85	186	120	-26	26r	389	
Total demand	358,663	356,749	*-0.5*	83,765	82,037	92,633	98,356	83,200	80,625	94,568	96,109r	80,318	*-3.5*
TRANSFORMATION	-	-		-	-	-	-	-	-	-	-	-	
Energy industry use [5]	27,896	26,631	*-4.5*	6,615	6,592	7,154	6,974	6,297	6,273	7,087	6,969	6,194	*-1.6*
Losses	27,319	26,323	*-3.6*	5,499	5,065	7,499	8,713	6,016	4,969	6,624	8,348	6,016	-
FINAL CONSUMPTION	303,448	303,795	*+0.1*	71,651	70,380	77,979	82,669	70,886	69,383	80,857	80,793r	68,108	*-3.9*
Iron & steel	3,688	2,847	*-22.8*	935	887	875	708	703	707	730	714	702	*-0.1*
Other industries	89,219	88,961	*-0.3*	22,156	22,267	20,827	22,387	21,728	22,000	22,845	22,369r	21,287	*-2.0*
Transport	4,516	4,669	*+3.4*	1,129	1,129	1,129	1,167	1,167	1,167	1,167	1,167	1,167	-
Domestic	107,764	107,971	*+0.2*	24,148	22,124	29,947	31,904	24,014	21,831	30,222	30,994r	22,422	*-6.6*
Other final users	98,262	99,347	*+1.1*	23,282	23,974	25,202	26,502	23,274	23,679	25,892	25,548r	22,530	*-3.2*
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 2016 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, along with energy used by other fuel industries (including coal and coke, blast furnaces, extraction of oil and gas, petroleum refiniries, nuclear fuel production and gas and electricity supply) .