

Section 5 - Electricity

Key results show:

In 2016 Q3, total electricity generated fell by 1.2 per cent, from 76.4 TWh a year earlier to 75.4 TWh. **(Chart 5.1)**.

Low carbon electricity's share of generation increased from 45.3 per cent to a record high 50.0 per cent, due to increased generation from renewables and nuclear. **(Chart 5.3)**.

Renewables' share of electricity generation was 25.0 per cent in 2016 Q3, up 1.3 percentage points on the share in 2015 Q3. **(Chart 5.2)**.

Coal's share of generation decreased from 16.7 per cent to 3.6 per cent, whilst gas' share of generation increased from 34.8 per cent in the third quarter of 2015 to 43.6 per cent in the third quarter of 2016. **(Chart 5.2)**.

Nuclear's share of generation rose from 21.7 per cent in the third quarter of 2015 to 25.0 per cent in the third quarter of 2016 following outages in 2015. **(Chart 5.2)**.

The UK remains a net importer with 6.2 per cent of electricity supplied from net imports in the third quarter of 2016. **(Chart 5.4)**.

Final consumption of electricity during the third quarter of 2016, at 68.9 TWh, was 1.9 per cent lower than in the same period last year which, alongside a fall in losses, left overall demand 2.5 per cent lower than in Q3 2015. Domestic sales fell by 2.9 per cent compared to the same quarter in 2015. **(Chart 5.5)**.

Relevant tables

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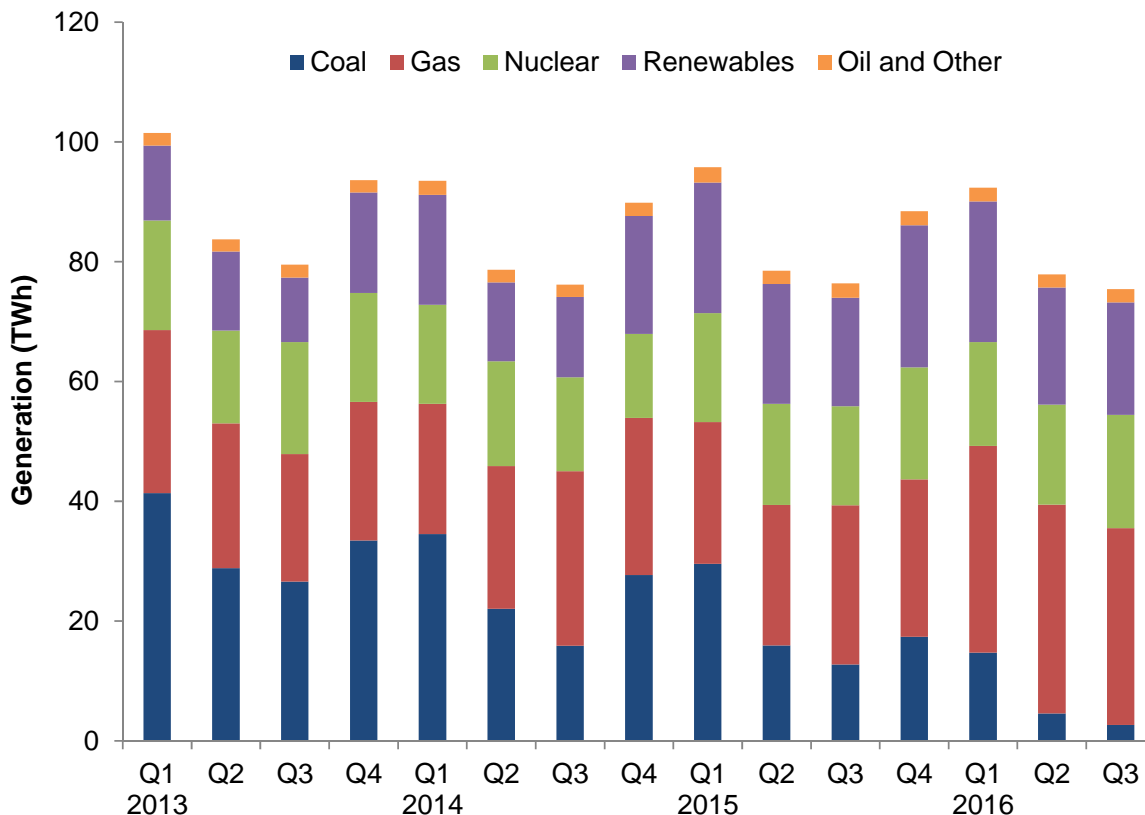
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Chart 5.1 Electricity generated by fuel type

Despite a 3.3 per cent fall in Major Power Producers¹ (MPPs) generation in the third quarter of 2016, overall generation only fell by 1.2 per cent. This was due to an 11 per cent increase in generation from other generators, mostly as a result of an increase in wind and solar capacity.

Coal fired generation fell by 79 per cent from 12.8 TWh in 2015 Q3 to a record low 2.7 TWh in 2016 Q3, due to a reduction in coal capacity, including the closures of Ferrybridge C and Longannet in March 2016 along with the conversion of a unit at Drax from coal to high-range co-firing (85% to <100% biomass). In 2016 Q3, gas fired generation increased by 24 per cent from 26.6 TWh to 32.9 TWh. Nuclear generation rose by 14 per cent from 16.6 TWh in 2015 Q3 to 18.9 TWh in 2016 Q3.

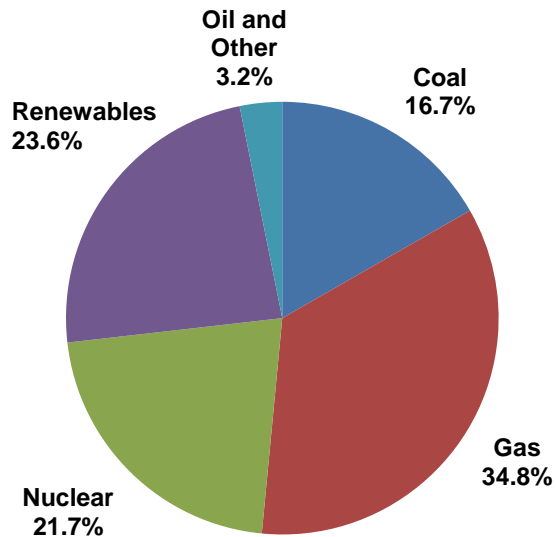
In 2016 Q3, wind and solar generation rose by 17 per cent, from 9.9 TWh to 11.6 TWh. Wind generation was up 12 per cent compared with a year ago whilst solar generation rose by 30 per cent, due to a 29 per cent increase in capacity. Hydro generation rose 11 per cent, from 1.03 TWh to 1.14 TWh, with 56 per cent more rainfall than a year ago.

¹ Major Power Producers are plants with the primary purpose of generating electricity to be supplied to the public supply grid.

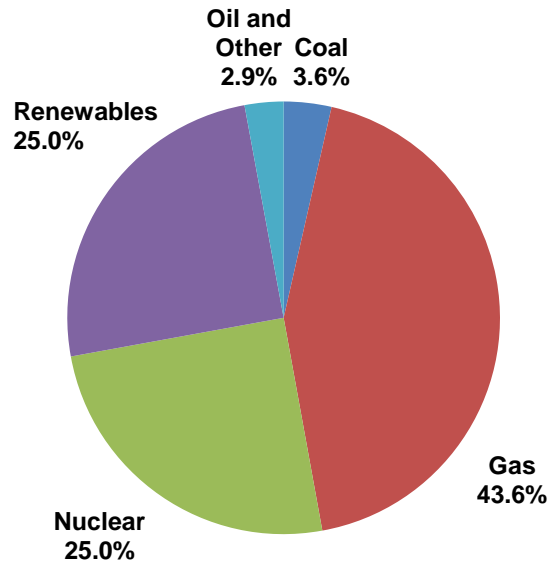
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Chart 5.2 Shares of electricity generation

Q3 2015

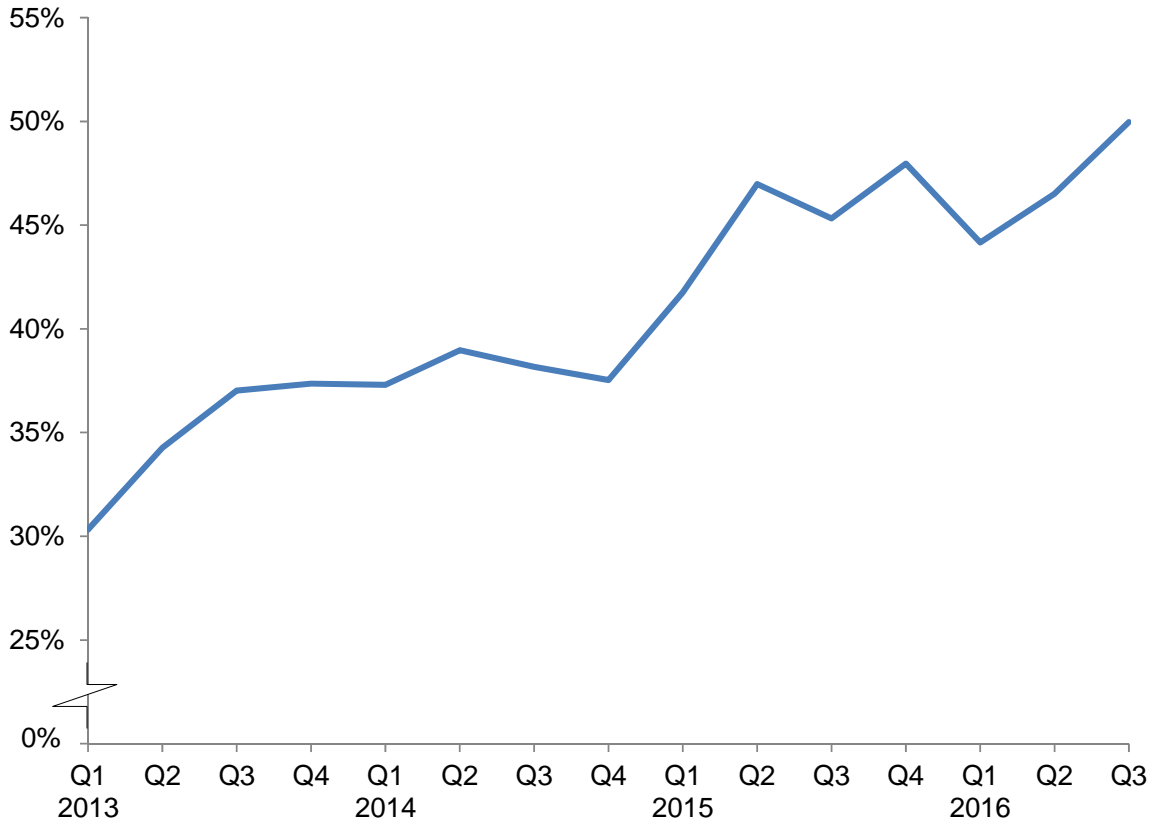


Q3 2016



The share of generation from coal decreased from 16.7 per cent in 2015 Q3 to 3.6 per cent in 2016 Q3. Gas's share of generation increased from 34.8 per cent in 2015 Q3 to 43.6 per cent in 2016 Q3. Nuclear's share of generation increased from 21.7 per cent in 2015 Q3 to 25.0 per cent in 2016 Q3.

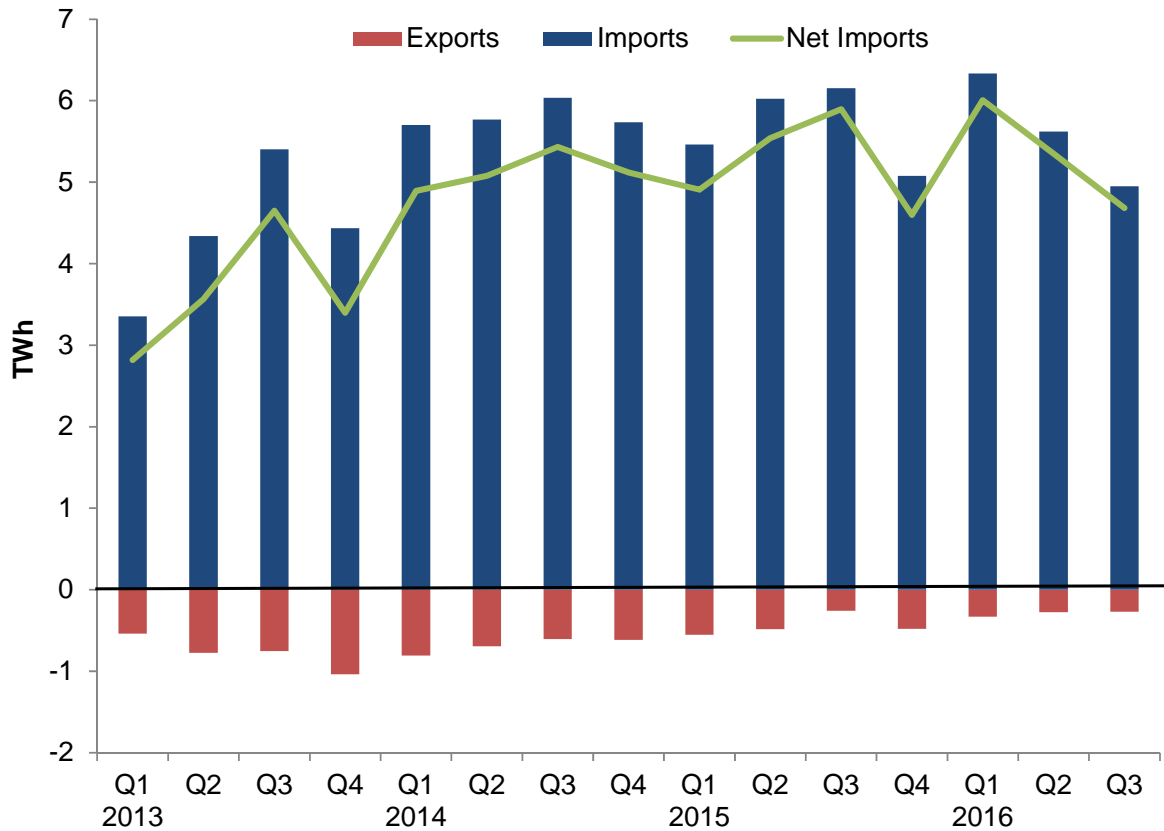
The share of renewables (wind, solar, hydro and other renewables) increased from 23.6 per cent in 2015 Q3 to 25.0 per cent in 2016 Q3. This was primarily due to an increase in wind and solar capacity which compensated for a reduction in bioenergy generation following outages at Drax.

Chart 5.3 Low carbon electricity's share of generation

Low carbon electricity's share of generation increased from 45.3 per cent in 2015 Q3 to a record high 50.0 per cent in 2016 Q3, with the fall in coal generation replaced by an increase in generation from renewables and nuclear.

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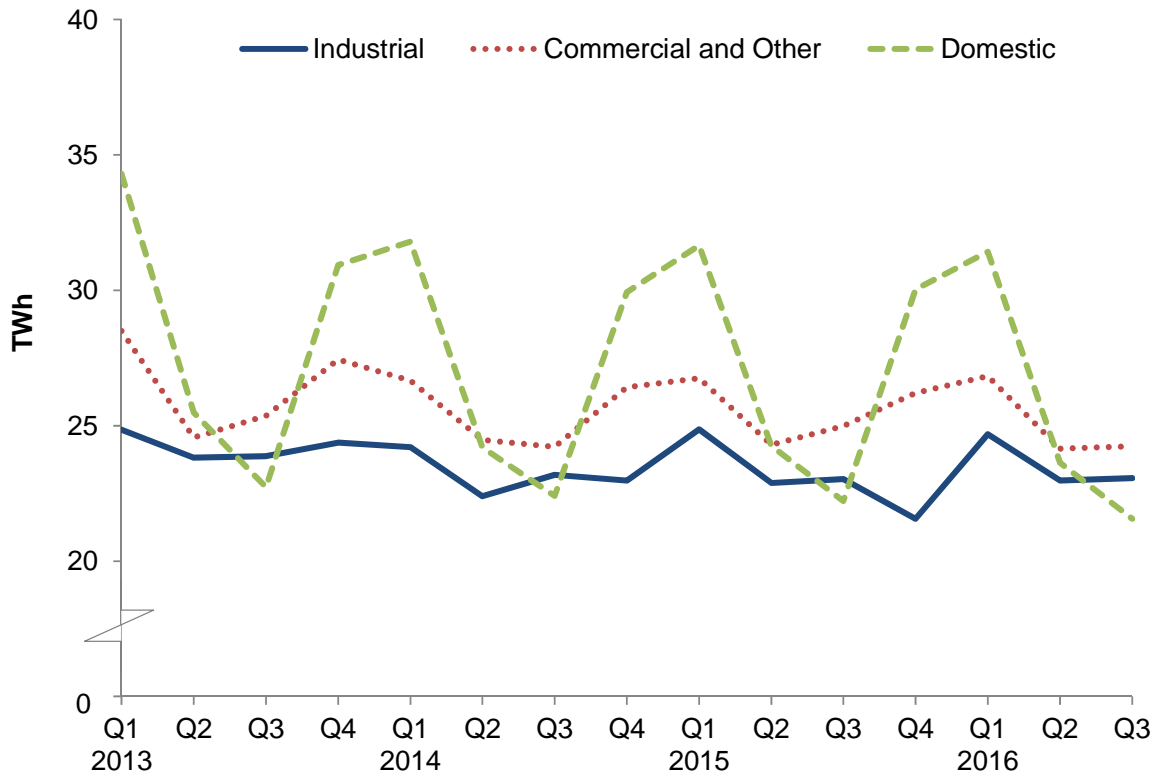
Chart 5.4 UK trade in electricity



In 2016 Q3, compared with the same period in 2015, imports of electricity fell by 20 per cent (-1.2 TWh) to 5.0 TWh mostly due to a reduction in imports from France with maintenance being carried out on the UK-France interconnector. Exports increased by 3.6 per cent to 0.27 TWh mostly due to increased exports to France following a number of French nuclear outages. The UK has been a net importer of electricity since 2010 Q1.

Net imports of electricity decreased by 21 per cent from 5.9 TWh in 2015 Q3 to 4.7 TWh in 2016 Q3, with a fall in imports from the Netherlands and France. Total imports from Ireland to Wales were over 2.5 times larger than Q3 2015 at 0.38 TWh whilst Wales to Ireland exports were down by 63 per cent to 0.09 TWh.

Chart 5.5 Electricity final consumption



Final consumption of electricity fell by 1.9 per cent in 2016 Q3, from 70.2 TWh in 2015 Q3, to 68.9 TWh.

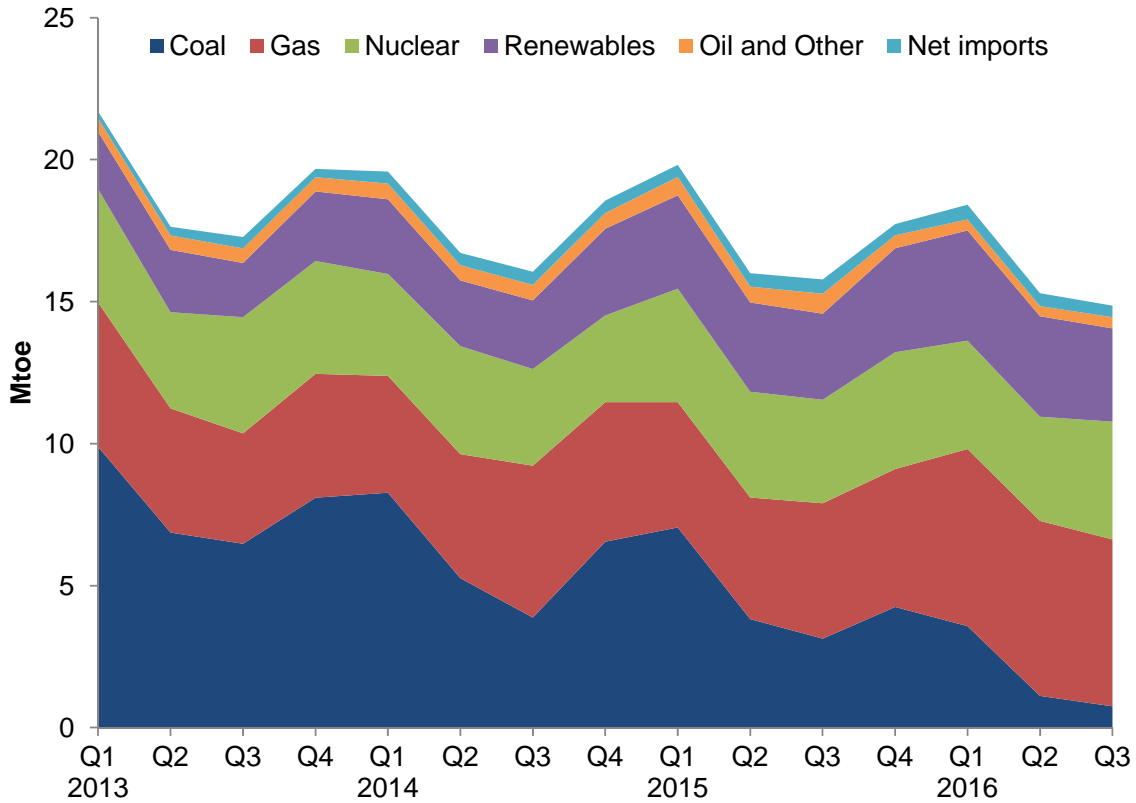
Domestic use also dropped by 2.9 per cent from 22.2 TWh in Q3 2015 to 21.6 TWh in Q3 2016.

Industrial use of electricity, including iron and steel, increased slightly by 0.1 per cent from 23.0 TWh to 23.1 TWh, while consumption by commercial, transport and other final users decreased by 3.0 per cent, from 25.0 TWh to 24.2 TWh.

In 2016 Q3, temperatures were on average 1.6 degrees higher than in 2015 Q3 – see Energy Trends table 7.1 at: www.gov.uk/government/statistics/energy-trends-section-7-weather.

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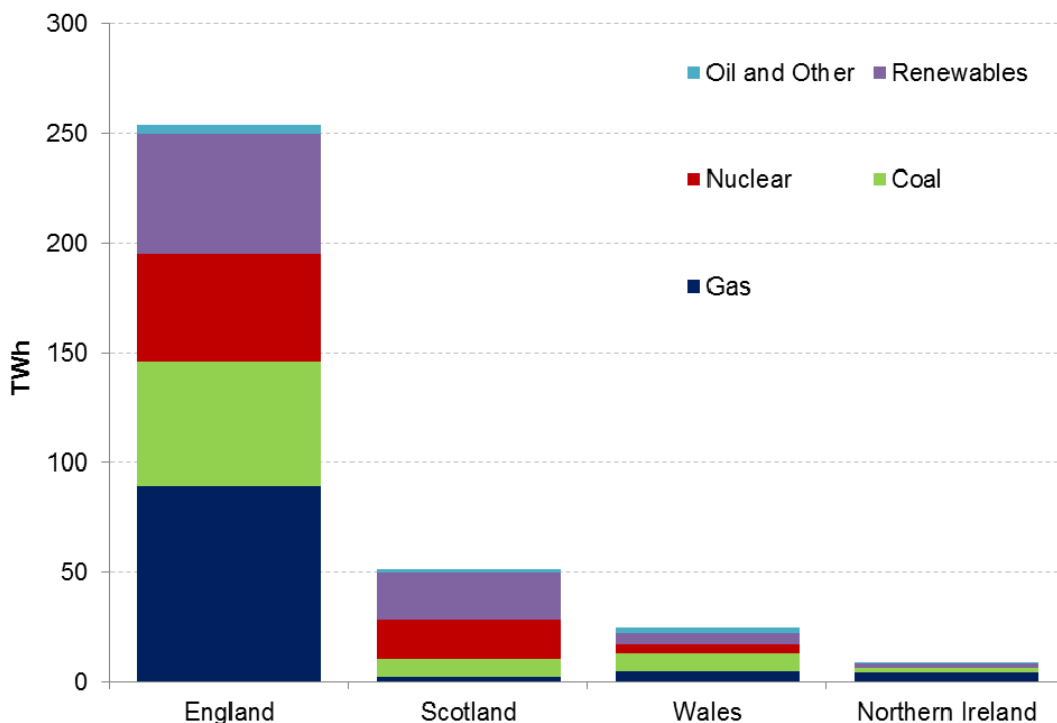
Chart 5.6 Fuel used for electricity generation



Fuel used by generators fell 5.9 per cent, from 15.8 mtoe in 2015 Q3 to 14.9 mtoe in 2016 Q3 (note that for wind (and other primary renewable sources), the fuel used is assumed the same as the electricity generated, unlike thermal generation where conversion losses are incurred).

In 2016 Q3, gas use was 23 per cent higher than in 2015. Coal use during the quarter was 76 per cent lower than a year earlier, whilst nuclear sources rose by 14 per cent.

Chart 5.7 Generation by fuel in 2015 for England, Scotland, Wales and Northern Ireland



In 2015, England had a share of 75.1 per cent of electricity generation in the UK with 254.7 TWh. Of England's generation 35.0 per cent was from gas and 22.4 per cent was from coal.

Scotland had a share of 15.1 per cent of electricity generation in the UK with 51.2 TWh. Of Scotland's generation 34.7 per cent was from nuclear, 42.2 per cent from renewables, and 16.2 per cent was from coal.

Wales had a share of 7.2 per cent of electricity generation in the UK with 24.5 TWh. Of Wales's generation 19.9 per cent was from gas, with 32.7 per cent from coal.

Northern Ireland had a share of 2.5 per cent of electricity generation in the UK with 8.6 TWh. Of Northern Ireland's generation, 48.3 per cent came from gas and 24.9 per cent came from coal.

Of electricity generated in the UK, 24.6 per cent came from renewables in 2015. The shares of electricity generated by renewables for each country are: Scotland 42.2 per cent, Northern Ireland 26.0 per cent, England 21.5 per cent and Wales 20.0 per cent.

Data from special feature article "Electricity generation and supply figures for Scotland, Wales and Northern Ireland and England, 2012 to 2015" (see page 65).

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Table 5.1. Fuel used in electricity generation and electricity supplied

	2014	2015	per cent change	2014 3rd quarter	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter	2016 2nd quarter	2016 3rd quarter	per cent change ¹
FUEL USED IN GENERATION													
All generating companies													
	Million tonnes of oil equivalent												
Coal	23.97	18.26	-23.8	3.88	6.55	7.05	3.82	3.13	4.25	3.57	1.12	0.75	-76.1
Oil	0.55	0.62	+11.9	0.13	0.12	0.16	0.12	0.18	0.16	0.12r	0.09r	0.13	-29.5
Gas	18.73	18.31	-2.2	5.35	4.91	4.41	4.28	4.77	4.86	6.24r	6.16r	5.88	+23.3
Nuclear	13.85	15.48	+11.8	3.40	3.05	4.00	3.72	3.64	4.11	3.82	3.67	4.15	+13.9
Hydro	0.51	0.54	+6.7	0.07	0.15	0.17	0.12	0.09	0.16	0.18r	0.08r	0.10	+10.8
Wind and Solar ²	3.10	4.12	+32.9	0.58	0.97	1.10	0.99	0.85	1.17	1.12r	0.95r	1.00	+17.0
Bioenergy ³	6.82	8.46	+24.2	1.77	1.94	2.01	2.03	2.09	2.33	2.58r	2.51r	2.19	+4.7
Other fuels	1.63	1.75	+7.4	0.42	0.43	0.50	0.44	0.52	0.29	0.27	0.27	0.27	-49.0
Net imports	1.76	1.80	+2.0	0.47	0.44	0.42	0.48	0.51	0.40	0.52	0.46	0.40	-20.5
Total all generating companies	70.91	69.33	-2.2	16.05	18.56	19.82	16.00	15.78	17.73	18.41r	15.30r	14.86	-5.9
ELECTRICITY GENERATED													
All generating companies													
	TWh												
Coal	100.23	75.63	-24.5	15.89	27.69	29.54	15.92	12.77	17.40	14.73	4.56r	2.69	-78.9
Oil	1.90	2.13	+12.5	0.44	0.41	0.62	0.43	0.58	0.50	0.42r	0.39r	0.42	-28.0
Gas	100.89	100.03	-0.9	29.15	26.23	23.70	23.47	26.58	26.29	34.55r	34.90r	32.86	+23.6
Nuclear	63.75	70.34	+10.3	15.66	14.06	18.17	16.92	16.56	18.69	17.34	16.66	18.86	+13.9
Hydro (natural flow)	5.89	6.29	+6.7	0.78	1.75	2.01	1.43	1.03	1.82	2.08r	0.93r	1.14	+10.8
Wind and Solar ²	36.01	47.87	+33.0	6.70	11.22	12.81	11.48	9.93	13.66	13.00r	11.03r	11.62	+17.0
- of which, Offshore ⁶	13.40	17.42	+30.0	2.24	4.69	4.68	3.58	3.41	5.76	5.15r	3.25r	3.54	+3.8
Bioenergy ³	22.68	29.39	+29.6	5.94	6.69	7.00	7.06	7.10	8.24	8.38r	7.60r	6.07	-14.5
Pumped Storage	2.88	2.74	-5.0	0.63	0.79	0.72	0.65	0.65	0.71	0.76r	0.69r	0.69	+6.0
Other fuels	3.94	4.66	+18.4	0.99	1.01	1.20	1.16	1.18r	1.12r	1.10r	1.12r	1.08	-8.8
Total all generating companies	338.17	339.10	+0.3	76.17	89.85	95.78	78.52	76.37	88.43	92.36r	77.88r	75.42	-1.2
ELECTRICITY SUPPLIED⁴													
All generating companies													
	TWh												
Coal	95.07	71.75	-24.5	15.07	26.26	28.03	15.11	12.11	16.50	13.97	4.33r	2.55	-78.9
Oil	1.72	1.94	+12.5	0.40	0.37	0.57	0.39	0.53	0.45	0.38r	0.35r	0.38	-28.0
Gas	99.00	98.16	-0.9	28.62	25.74	23.26	23.01	26.08	25.81	33.99r	34.26r	32.25	+23.7
Nuclear	57.90	63.89	+10.3	14.22	12.77	16.51	15.37	15.04	16.98	15.75	15.13	17.13	+13.9
Hydro	5.84	6.24	+6.9	0.77	1.74	2.00	1.41	1.02	1.81	2.06r	0.92r	1.13	+10.8
Wind and Solar ²	36.01	47.87	+32.9	6.70	11.22	12.81	11.48	9.93	13.66	13.00r	11.03r	11.62	+17.0
- of which, Offshore ⁶	13.40	17.42	+30.0	2.24	4.69	4.68	3.58	3.41	5.76	5.15r	3.25r	3.54	+3.8
Bioenergy ³	19.59	25.53	+30.3	5.14	5.80	6.07	6.12	6.16	7.17	7.30r	6.61r	5.23	-15.1
Pumped Storage (net supply) ⁵	-1.01	-0.98	-3.0	-0.24	-0.26	-0.25	-0.23	-0.25	-0.25	-0.27r	-0.26r	-0.23	-6.0
Other fuels	3.68	4.32	+17.3	0.92	0.94	1.11	1.07	1.09	1.04	1.02r	1.03r	0.99	-8.9
Net imports	20.52	20.94	+2.0	5.43	5.12	4.91	5.54	5.89	4.60	6.00	5.35	4.68	-20.5
Total all generating companies	338.33	339.65	+0.4	77.04	89.71	95.00	79.28	77.60	87.77	93.20r	78.76r	75.73	-2.4

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>												
	2014	2015	<i>Per cent change</i>	2014 3rd quarter	2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter	2016 2nd quarter	2016 3rd quarter p	<i>Per cent change¹</i>
SUPPLY													
Indigenous production	338,175	339,095	+0.3	76,171	89,851	95,782	78,518	76,371	88,425	92,361r	77,881r	75,420	-1.2
Major power producers ^{2,3}	297,939	293,003	-1.7	66,368	79,522	84,255	66,555	64,840	77,353	80,465r	65,313r	62,625	-3.4
Auto producers	37,352	43,353	+16.1	9,175	9,535	10,805	11,313	10,878	10,358	11,134r	11,879r	12,103	+11.3
Other sources ⁴	2,883	2,739	-5.0	628	793	723	650	653	714	762r	689	693	+6.0
Imports	23,243	22,716	-2.3	6,036	5,737	5,462	6,023	6,152	5,080	6,334	5,622	4,951	-19.5
Exports	2,723	1,778	-34.7	604	618	555	484	259	480	331	275	268	+3.6
Transfers	-	-	-	-	-	-	-	-	-	-	-	-	-
Total supply	358,694	360,034	+0.4	81,604	94,970	100,689	84,056	82,263	93,025	98,364r	83,227r	80,102	-2.6
Statistical difference	-1,210	1,671	-	-334	-153	504	419	284	464	-194r	190r	189	-
Total demand	359,905	358,363	-0.4	81,938	95,123	100,186	83,637	81,979	92,560	98,558r	83,037r	79,913	-2.5
TRANSFORMATION													
Energy industry use ⁵	28,387	28,160	-0.8	6,503	7,278	7,603	6,677	6,662	7,218	7,043r	6,371	6,331	-5.0
Losses	28,651	27,458	-4.2	5,621	8,521	9,307	5,525	5,088	7,538	8,569r	5,905r	4,718	-7.3
FINAL CONSUMPTION	302,867	302,745	-	69,813	79,324	83,276	71,436	70,229	77,805	82,946r	70,762r	68,864	-1.9
Iron & steel	3,787	3,688	-2.6	937	949	990	935	887	875	868	864	864	-2.6
Other industries	88,978	88,659	-0.4	22,251	22,027	23,872	21,951	22,143	20,693	23,818r	22,108r	22,198	+0.2
Transport	4,504	4,476	-0.6	1,126	1,126	1,119	1,119	1,119	1,119	1,119	1,119	1,119	-
Domestic	108,324	108,157	-0.2	22,407	29,929	31,657	24,257	22,214	30,029	31,423r	23,634r	21,565	-2.9
Other final users	97,274	97,765	+0.5	23,093	25,293	25,637	23,173	23,866	25,089	25,717r	23,036r	23,118	-3.1
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, 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) .