

Section 5 - Electricity

Key results show:

In 2017 Q3, total electricity generated fell by 2.2 per cent, from 76.1 TWh a year earlier to 74.4 TWh. **(Chart 5.1)**.

Low carbon electricity's share of generation increased from 50.2 per cent to a record high of 54.4 per cent, due to increased generation from renewables. Renewables' share of electricity generation was 30.0 per cent in 2017 Q3, a record high for Q3; and up 4.6 percentage points on the share in 2016 Q3. This was due to increased renewable capacity. **(Charts 5.2 and 5.3)**.

Gas and coal made up a record low of 42.0 per cent of generation (down 4.5pp) in Q3 2017. Coal's share of generation decreased from 3.6 per cent to 2.9 per cent, whilst gas' share of generation decreased from 42.9 per cent in the third quarter of 2016 to 39.1 per cent in the third quarter of 2017. Nuclear remained a significant component at 24.4 per cent, down from 24.8 per cent last year **(Chart 5.2)**.

The UK remains a net importer with 7.2 per cent of electricity supplied from net imports in the third quarter of 2017. **(Chart 5.4)**.

Final consumption of electricity during the third quarter of 2017, at 68.1 TWh, was 1.9 per cent lower than in the same period last year which, alongside an increase in losses, left overall demand 1.3 per cent lower than in Q3 2016. Domestic sales increased by 1.1 per cent compared to the same quarter in 2016. **(Chart 5.5)**.

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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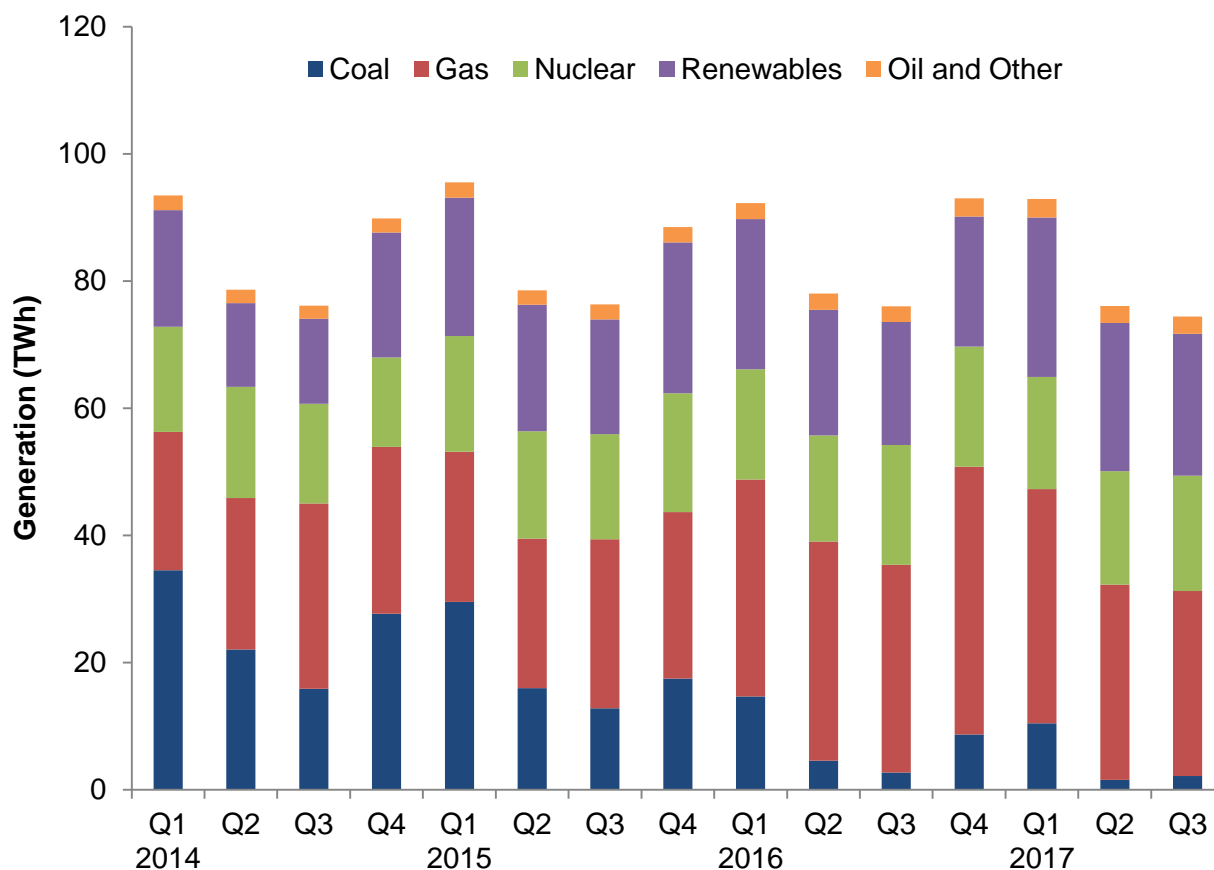
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Chart 5.1 Electricity generated by fuel type (Table 5.1)

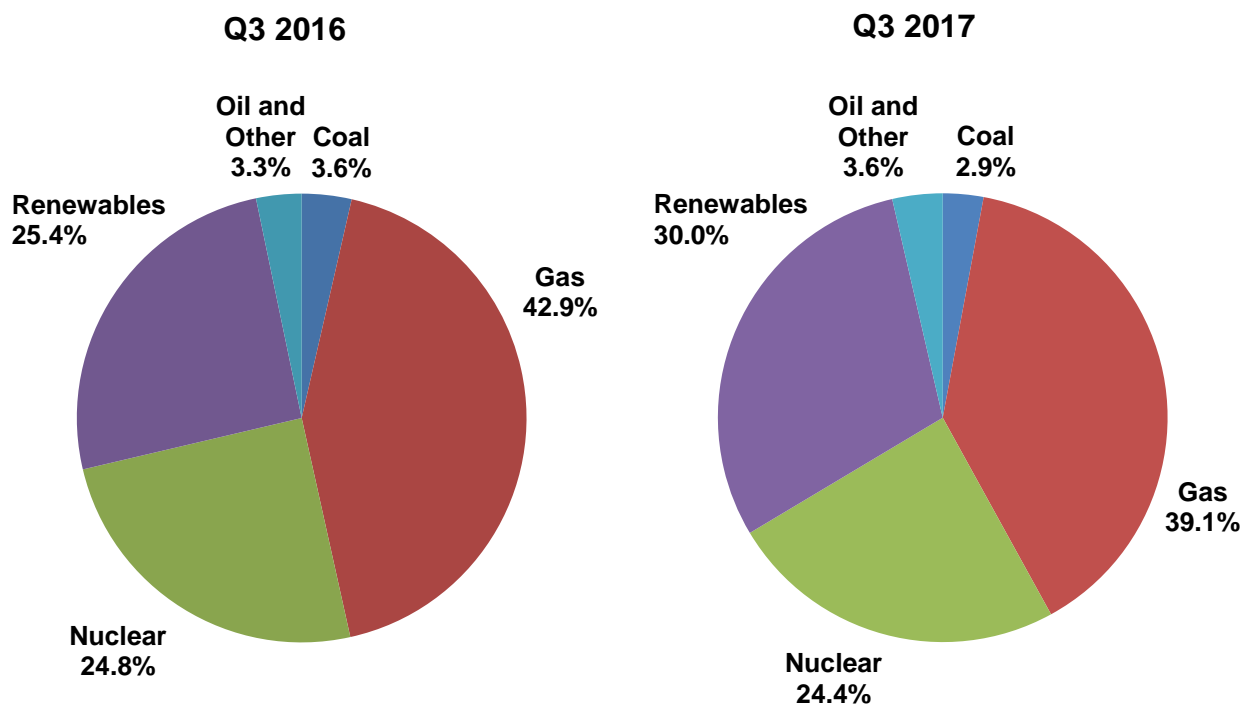
Overall generation fell by 2.2 per cent, due to falls in both MPP and other generators generation compared to the same period last year.

Although weather conditions were poorer compared to Q3 2016, increased capacity contributed to an overall increase in renewables generation. Wind generation increased by 15.9 per cent despite a small drop of 0.3 knots in average wind speeds; this was due to a 21 per cent increase in capacity over the period. Solar generation increased by 4.2 per cent despite a decrease of 0.6 average daily sun hours, this was due to an 7.6 per cent increase in capacity compared to the same period last year. Hydro generation increased by 8.3 per cent.

Gas and coal made up a record low of 42 per cent of generation (down 4.5pp) in Q3 2017. This reduction was mainly due to increased baseload (non-thermal renewable and nuclear) generation offsetting the need for fossil fuel generation. Coal fired generation fell by 20 per cent to 2.2TWh, while gas fell by 11 per cent to 29TWh. Generation from Bioenergy was up 23 per cent, making up 10.3 per cent (up 2.1pp) of generation for Q3 2017. This was mainly due to low generation in the same period last year, partly caused by long periods of outage at Drax. Nuclear accounted for 24.4 per cent of generation, down from 24.8 per cent in the same period last year.

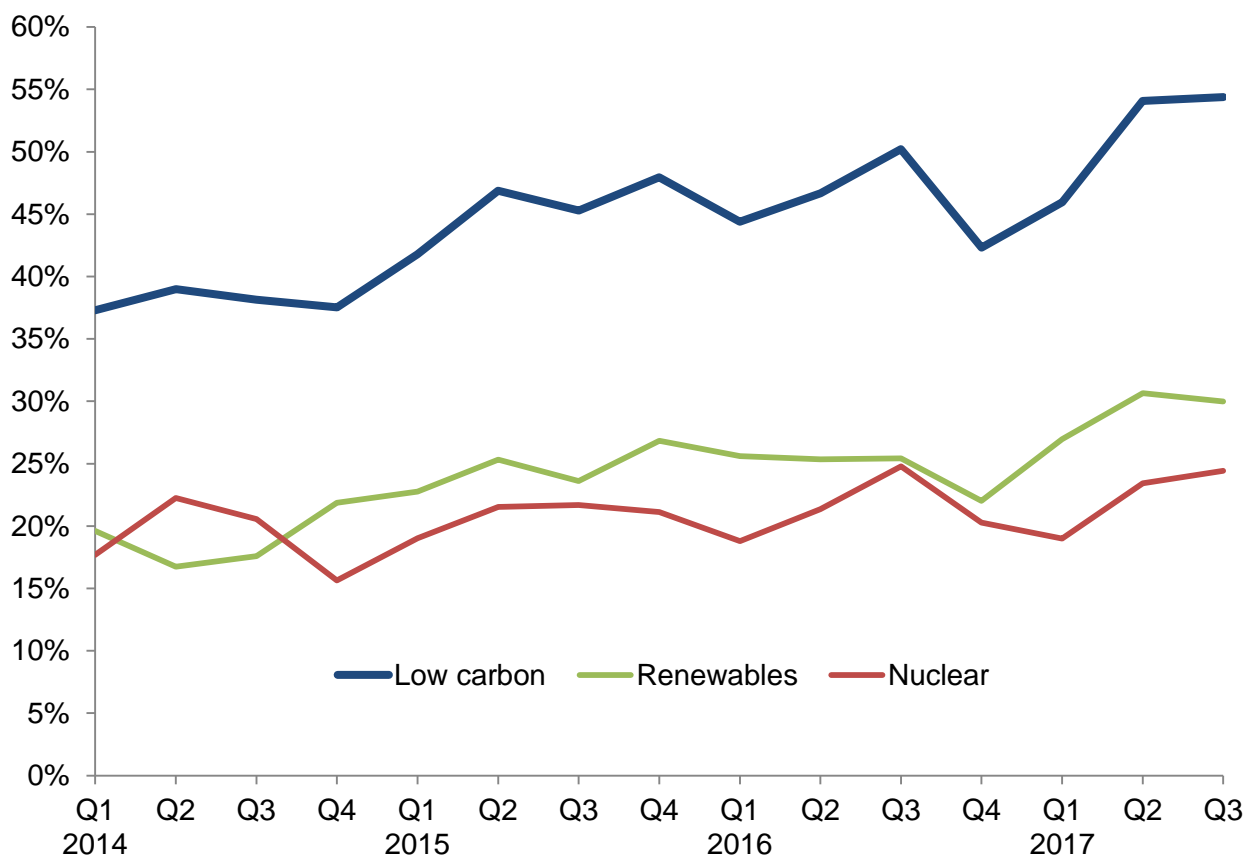
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Chart 5.2 Shares of electricity generation (Table 5.1)



The share of renewables (wind, solar, hydro and other renewables) increased from 25.4 per cent in 2016 Q3 to 30.0 per cent in 2017 Q3, a record high for this measure in Q3. This was due to an increase in wind and solar capacity; as well as higher bioenergy generation compared to last year, due to outages at Drax in Q3 2016.

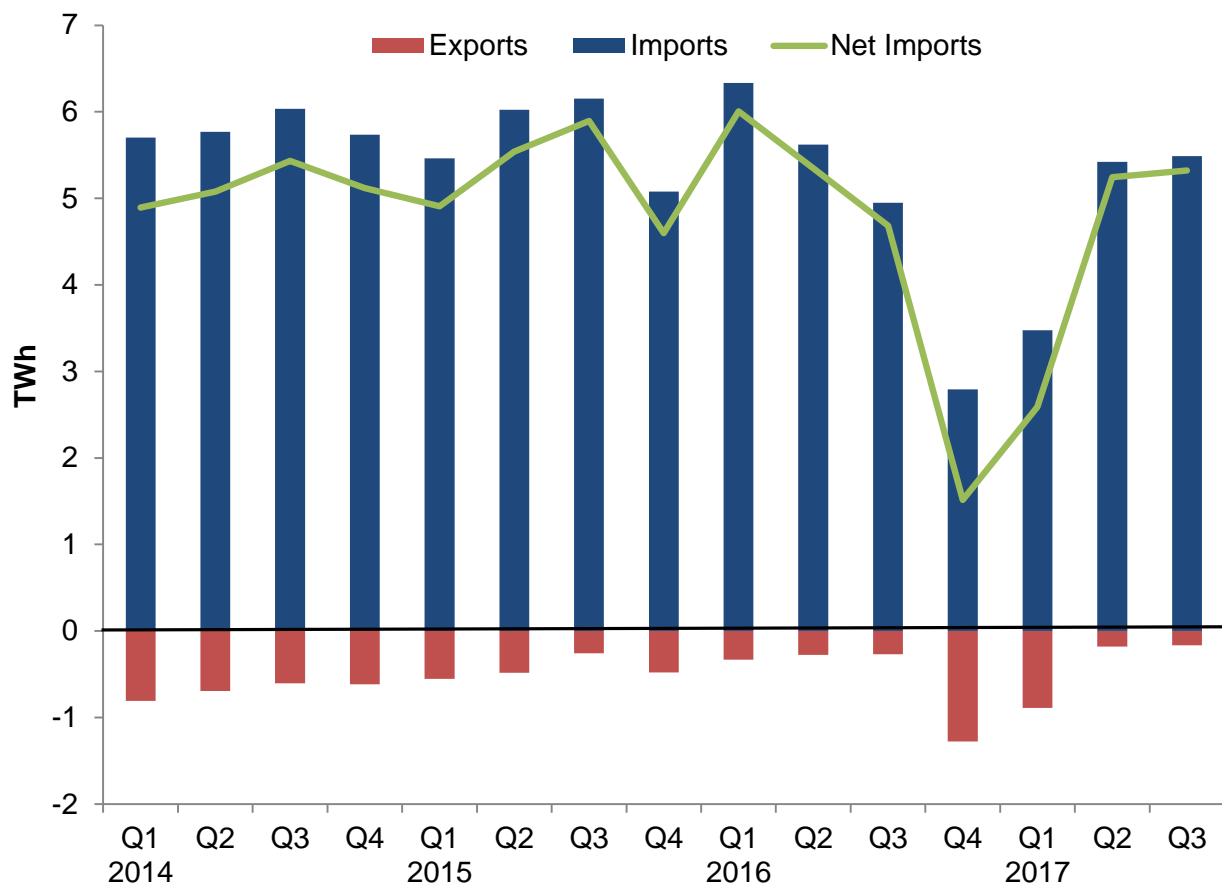
With generation from nuclear sources relatively stable, generation from fossil fuels dropped as a result of the growth of renewables. The share of generation from coal decreased from 3.6 per cent in 2016 Q3 to 2.9 per cent in 2017 Q3. Gas's share of generation decreased from 42.9 per cent in 2016 Q3 to 39.1 per cent in 2017 Q3.

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

Low carbon electricity's share of generation increased from 50.2 per cent in 2016 Q3 to a record high 54.4 per cent in 2017 Q3, with increasing generation from renewables, replacing coal and gas generation.

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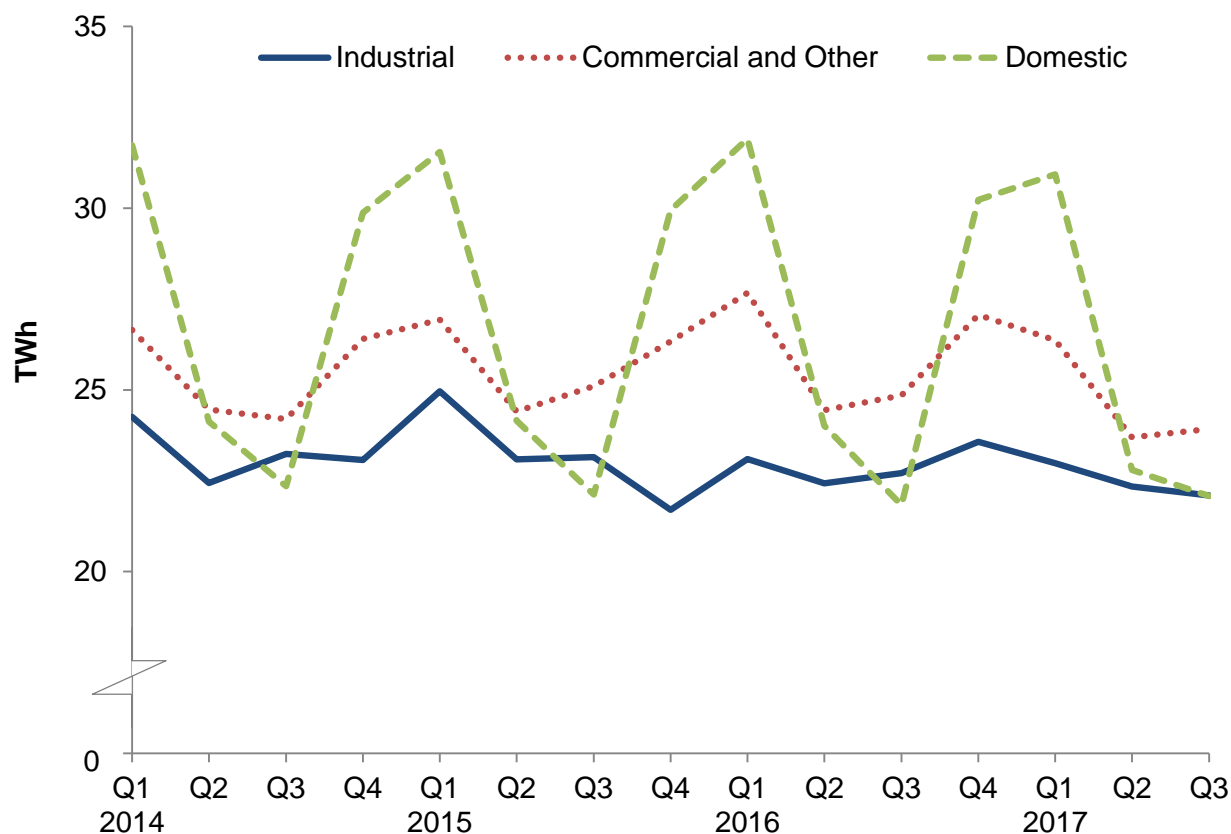
Chart 5.4 UK trade in electricity (Table 5.6)



In 2017 Q3, compared with the same period in 2016, imports of electricity grew by 11 per cent (+0.5 TWh) to 5.5 TWh mostly due to an increase in imports from France. Exports decreased by 38 per cent to 0.17 TWh mostly due to increased exports to France in Q3 2016 following a number of French nuclear outages. The UK has been a net importer of electricity since 2010 Q2.

Net imports of electricity increased by 14 per cent from 4.7 TWh in 2016 Q3 to 5.3 TWh in 2017 Q3, with a rise in imports and drop in exports for the Netherlands and France. Both imports and exports between Ireland and Wales increased in Q3 2017 compared to Q3 2016. This increased the utilisation of the interconnector by 35 per cent (to 58 per cent of its capacity), and was partially due to damage to the interconnector in September last year. Northern Ireland was a net exporter to Ireland in Q3 2017 for the first time since Q1 2014. Imports from Ireland were down 77 per cent, and exports were up over 150 per cent.

Chart 5.5 Electricity final consumption (Table 5.2)



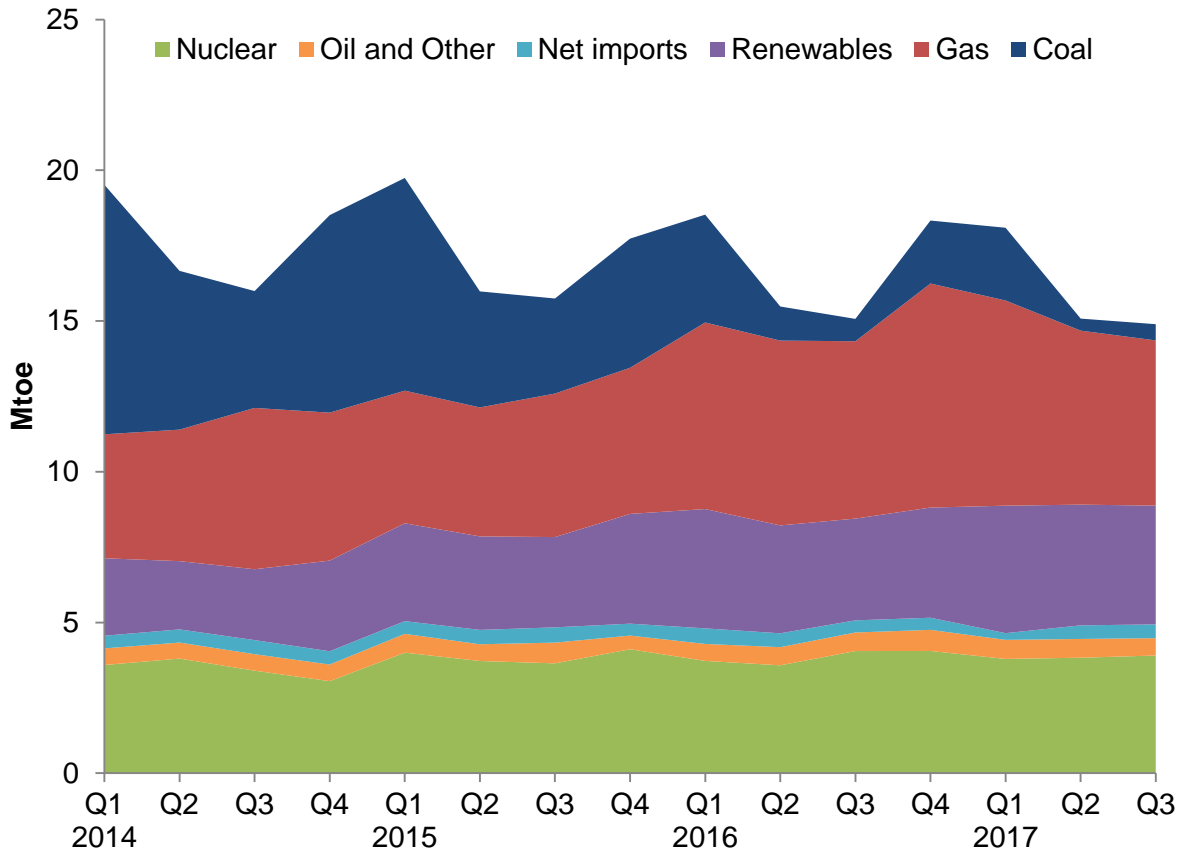
Final consumption of electricity fell by 1.9 per cent in 2017 Q3, from 69.4 TWh in 2016 Q3, to 68.1 TWh.

Domestic use increased by 1.1 per cent from 21.8 TWh in Q3 2016 to 22.1 TWh in Q3 2017. In 2017 Q3, temperatures were on average 1.2 degrees lower than in 2016 Q3 – 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, decreased by 2.7 per cent from 22.7 TWh to 22.1 TWh, while consumption by commercial, transport and other final users decreased by 3.7 per cent, from 24.9 TWh to 23.9 TWh.

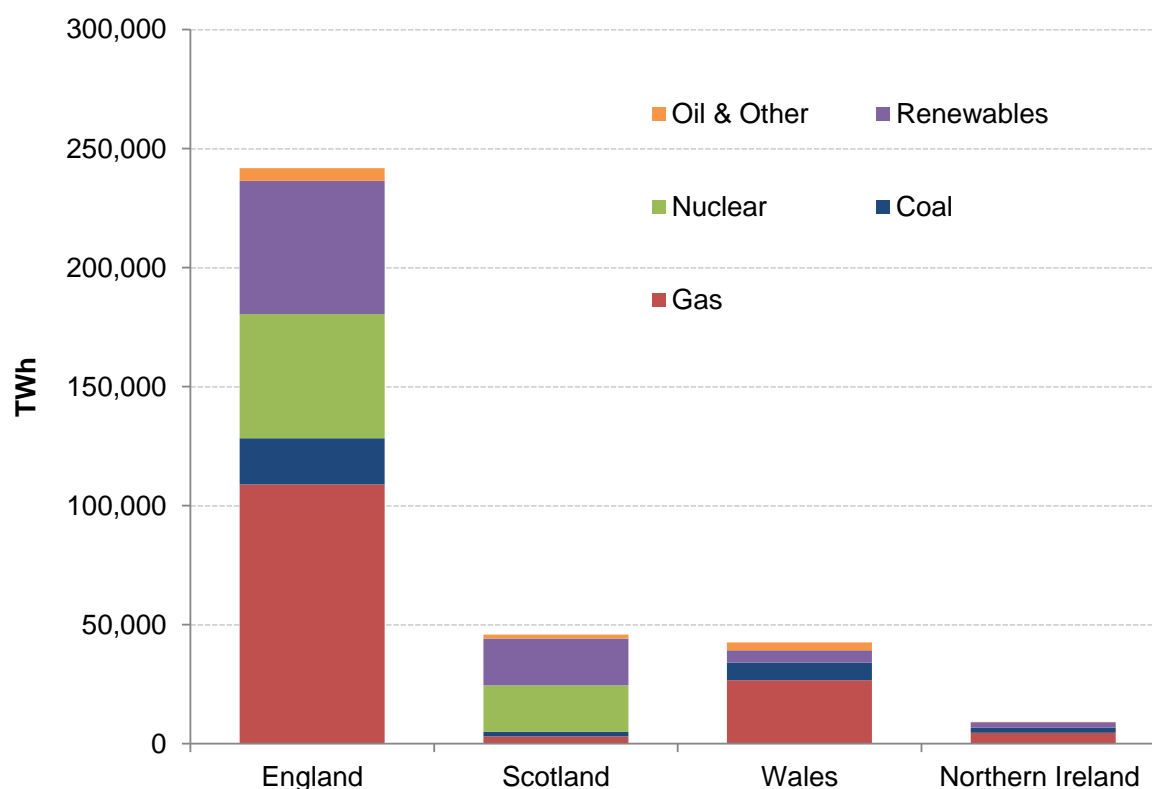
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Chart 5.6 Fuel used for electricity generation (Table 5.1)



Fuel used by generators fell 1.2 per cent, from 15.1 mtoe in 2016 Q3 to 14.9 mtoe in 2017 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 2017 Q3, gas use was 6.8 per cent lower than in 2016. Coal use during the quarter was 27 per cent lower than a year earlier, whilst nuclear sources fell by 3.6 per cent.

Chart 5.7 Generation by fuel in 2016 for England, Scotland, Wales and Northern Ireland

In 2016, England had a share of 71.3 per cent of electricity generation in the UK with 241.8 TWh. Of England's generation 45.0 per cent was from gas and 8.0 per cent was from coal.

Scotland had a share of 13.4 per cent of electricity generation in the UK with 45.9 TWh. Of Scotland's generation 42.8 per cent was from nuclear, 42.9 per cent from renewables, and 3.9 per cent was from coal.

Wales had a share of 12.5 per cent of electricity generation in the UK with 42.5 TWh. Of Wales's generation 62.9 per cent was from gas, with 17.2 per cent from coal.

Northern Ireland had a share of 2.7 per cent of electricity generation in the UK with 9.2 TWh. Of Northern Ireland's generation, 50.0 per cent came from gas and 23.3 per cent came from coal.

Of electricity generated in the UK, 24.5 per cent came from renewables in 2016. The shares of electricity generated by renewables for each country are: Scotland 42.9 per cent, Northern Ireland 25.4 per cent, England 23.1 per cent and Wales 12.3 per cent.

Data from special feature article "Electricity generation and supply figures for Scotland, Wales, Northern Ireland and England, 2013 to 2016" (see page 65).

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Table 5.1. Fuel used in electricity generation and electricity supplied

	2015	2016	per cent change	2015 3rd quarter	2015 4th quarter	2016 1st quarter	2016 2nd quarter	2016 3rd quarter	2016 4th quarter	2017 1st quarter	2017 2nd quarter	2017 3rd 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	3.15	4.28	3.58	1.13	0.74	2.09	2.41	0.40	0.54	-27.5
Oil	0.61	0.58	-3.6	0.17	0.17	0.11	0.15	0.16	0.16	0.18	0.16	0.18	+10.3
Gas	18.28	25.63	+40.2	4.76	4.85	6.19	6.13	5.88	7.43	6.81r	5.77r	5.48	-6.8
Nuclear	15.48	15.41	-0.4	3.64	4.11	3.73	3.58	4.05	4.06	3.79	3.83	3.91	-3.6
Hydro	0.54	0.46	-14.4	0.09	0.16	0.18	0.08	0.10	0.10	0.16r	0.08r	0.11	+8.3
Wind and Solar ²	4.12	4.11	-0.2	0.85	1.18	1.12	0.96	1.03	1.00	1.25	1.27r	1.15	+12.2
Bioenergy ³	8.32	9.99	+20.0	2.05	2.31	2.66	2.54	2.25	2.55	2.82r	2.66r	2.68	+19.1
Other fuels	1.71	1.90	+10.7	0.51	0.28	0.46	0.45	0.45	0.54	0.45	0.46	0.39	-12.9
Net imports	1.80	1.78	-1.1	0.51	0.40	0.52	0.46	0.40	0.40	0.22r	0.45r	0.46	+13.7
Total all generating companies	69.20	67.41	-2.6	15.75	17.73	18.53	15.48	15.07	18.33	18.09r	15.08r	14.89	-1.2
ELECTRICITY GENERATED													
All generating companies													
	TWh												
Coal	75.88	30.71	-59.5	12.83	17.48	14.69	4.58	2.72	8.72	10.48r	1.56	2.17	-20.2
Oil	2.04	1.84	-9.7	0.54	0.55	0.34	0.56	0.44	0.50	0.78r	0.60r	0.64	+44.0
Gas	99.88	143.36	+43.5	26.56	26.20	34.11	34.49	32.67	42.10	36.82r	30.73r	29.08	-11.0
Nuclear	70.34	71.73	+2.0	16.56	18.69	17.34	16.66	18.86	18.87	17.64	17.83	18.17	-3.6
Hydro (natural flow)	6.30	5.39	-14.4	1.03	1.83	2.09	0.94	1.15	1.21	1.84r	0.88r	1.25	+8.3
Wind and Solar ²	47.86	47.79	-0.2	9.93	13.69	13.02	11.13	11.96	11.67	14.50r	14.72r	13.42	+12.2
- of which, Offshore ⁶	17.42	16.41	-5.8	3.41	5.76	5.15	3.25	3.58	4.42	5.16r	3.98	3.95	+10.3
Bioenergy ³	29.24	30.04	+2.7	7.06	8.22	8.52	7.70	6.22	7.60	8.71r	7.73r	7.63	+22.8
Pumped Storage	2.74	2.96	+8.0	0.65	0.71	0.76	0.69	0.69	0.82	0.79	0.69	0.64	-8.1
Other fuels	4.64	5.57	+20.2	1.17	1.11	1.40	1.30	1.34	1.53	1.35	1.37r	1.41	+4.8
Total all generating companies	338.92	339.40	+0.1	76.34	88.49	92.27	78.04	76.06	93.03	92.92r	76.10r	74.42	-2.2
ELECTRICITY SUPPLIED⁴													
All generating companies													
	TWh												
Coal	71.99	29.14	-59.5	12.17	16.58	13.94	4.34	2.58	8.28	9.95	1.48	2.06	-20.2
Oil	1.85	1.67	-9.7	0.49	0.50	0.30	0.51	0.40	0.46	0.71r	0.55r	0.59	+46.0
Gas	98.00	140.84	+43.7	26.06	25.73	33.56	33.87	32.07	41.34	36.16r	30.18r	28.56	-10.9
Nuclear	63.89	65.15	+2.0	15.04	16.98	15.75	15.13	17.13	17.14	16.03	16.20	16.51	-3.6
Hydro	6.25	5.35	-14.4	1.02	1.82	2.07	0.93	1.14	1.20	1.83r	0.87r	1.24	+8.1
Wind and Solar ²	47.87	47.79	-0.2	9.93	13.69	13.02	11.13	11.96	11.67	14.50r	14.72r	13.42	+12.2
- of which, Offshore ⁶	17.42	16.41	-5.8	3.41	5.76	5.15	3.25	3.58	4.42	5.16r	3.98	3.95	+10.3
Bioenergy ³	25.38	26.02	+2.5	6.12	7.15	7.41	6.69	5.34	6.58	7.60r	6.72r	6.63	+24.0
Pumped Storage (net supply) ⁵	-0.98	-1.07	+8.6	-0.25	-0.25	-0.27	-0.26	-0.23	-0.30	-0.29	-0.25	-0.21	-9.1
Other fuels	4.30	5.16	+20.1	1.09	1.03	1.30	1.20	1.25	1.42	1.25	1.27r	1.31	+4.8
Net imports	20.94	17.55	-16.2	5.89	4.60	6.00	5.35	4.68	1.51	2.59r	5.24	5.32	+13.7
Total all generating companies	339.49	337.59	-0.6	77.57	87.83	93.08	78.88	76.33	89.30	90.33r	76.97r	75.42	-1.2

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 3rd quarter	2015 4th quarter	2016 1st quarter	2016 2nd quarter	2016 3rd quarter	2016 4th quarter	2017 1st quarter	2017 2nd quarter	2017 3rd quarter	Per cent change ¹
SUPPLY													
Indigenous production	338,917	339,398	+0.1	76,337	88,489	92,267	78,039	76,062	93,029	92,918r	76,099r	74,421	-2.2
Major power producers ^{2,3}	293,251	289,985	-1.1	64,903	77,438	80,565	65,450	63,025	80,945	80,636r	62,882r	61,651	-2.2
Auto producers	42,926	46,453	+8.2	10,780	10,337	10,940	11,900	12,345	11,268	11,491r	12,523r	12,133	-1.7
Other sources ⁴	2,739	2,959	+8.0	653	714	762	689	693	815	791	694	636	-8.1
Imports	22,716	19,699	-13.3	6,152	5,080	6,334	5,622	4,951	2,792	3,476r	5,423	5,487	+10.8
Exports	1,778	2,153	+21.1	259	480	331	275	268	1,279	888r	179	165	-38.5
Transfers	-	-	-	-	-	-	-	-	-	-	-	-	-
Total supply	359,855	356,943	-0.8	82,230	93,088	98,271	83,386	80,745	94,543	95,506r	81,342r	79,743	-1.2
Statistical difference	1,192	194		193	455	-85	186	120	-26	-471r	392r	147	
Total demand	358,663	356,749	-0.5	82,037	92,633	98,356	83,200	80,625	94,568	95,977r	80,950r	79,596	-1.3
TRANSFORMATION													
Energy industry use ⁵	27,896	26,631	-4.5	6,592	7,154	6,974	6,297	6,273	7,087	6,962r	6,228r	6,200	-1.2
Losses	27,319	26,323	-3.6	5,065	7,499	8,713	6,016	4,969	6,624	8,740r	5,888r	5,302	+6.7
FINAL CONSUMPTION													
Iron & steel	3,688	2,847	-22.8	887	875	708	703	707	730	714	702	685	-3.0
Other industries	89,219	88,961	-0.3	22,267	20,827	22,387	21,728	22,000	22,845	22,269r	21,637r	21,407	-2.7
Transport	4,516	4,669	+3.4	1,129	1,129	1,167	1,167	1,167	1,167	1,167	1,167	1,167	-
Domestic	107,764	107,971	+0.2	22,124	29,947	31,904	24,014	21,831	30,222	30,926r	22,799r	22,079	+1.1
Other final users	98,262	99,347	+1.1	23,974	25,202	26,502	23,274	23,679	25,892	25,198r	22,530	22,755	-3.9
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) .