

Section 5 - Electricity

Key results show:

Electricity generation increased only marginally in 2017 Q1 (+1.0 per cent) from 92.3 TWh a year earlier to 93.2 TWh (**Chart 5.1**); however, due to a 3.1 TWh fall in net imports over the same period, total electricity supplied fell 2.2 per cent to 96.1 TWh.

There were substantial shifts in fuel mix over the period. Coal's share of generation decreased from 15.9 per cent to 11.3 per cent, whilst gas' share rose from 37.0 per cent in the first quarter of 2016 to 39.9 per cent in the first quarter of 2017. (**Chart 5.2**).

Renewables' share of electricity generation increased from 25.6 per cent in the first quarter of 2016 to 26.6 per cent in the first quarter of 2017. (**Chart 5.2**).

Low carbon electricity (renewables plus nuclear) generation share increased from 44.4 per cent in the first quarter of 2016 to 45.6 per cent in the first quarter of 2017. (**Chart 5.3**).

The UK remains a net importer with 3.0 per cent of electricity supplied from net imports in the first quarter of 2017. However, net imports were down 52 per cent from the first quarter of 2016 due to damage to the France-UK interconnector. (**Chart 5.4**).

Final consumption of electricity during the first quarter of 2017, at 80.7 TWh, was 2.3 per cent lower than in the same period last year. Domestic sales fell by 3.2 per cent. (**Chart 5.5**).

Relevant tables

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Contacts for further information:

Stephen Ashcroft

Electricity Statistics

Tel: 0300 068 2928

Nick Jesson

Electricity Statistics

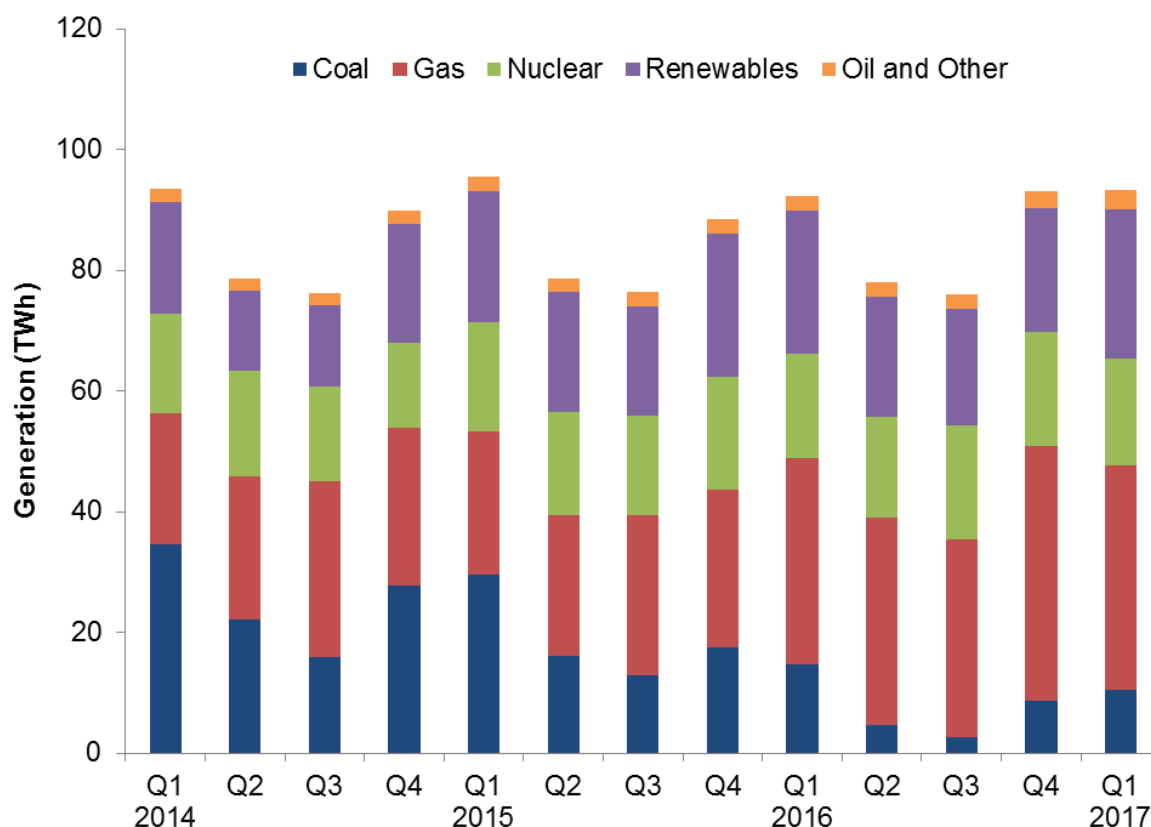
Tel: 0300 068 5346

Ravina Singh

Electricity Statistics

Tel: 0300 068 5046

E-mail: electricitystatistics@beis.gov.uk

Chart 5.1 Electricity generated by fuel type (Table 5.1)

In 2017 Q1, total electricity generated increased marginally by 1.0 per cent from 92.3 TWh in 2016 Q1 to 93.2 TWh. However, there have been substantial shifts in the generation mix.

Coal fired generation fell by 28 per cent from 14.7 TWh to a Q1 record low of 10.5 TWh due to plant closures and a market preference for gas generation. 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, despite the usual winter increase as the Supplemental Balancing Reserve stations came online to meet the increased seasonal demand. Between 2016 Q1 and 2017 Q1 gas fired generation rose 9.0 per cent from 34.1 TWh to 37.2 TWh as gas replaced coal.

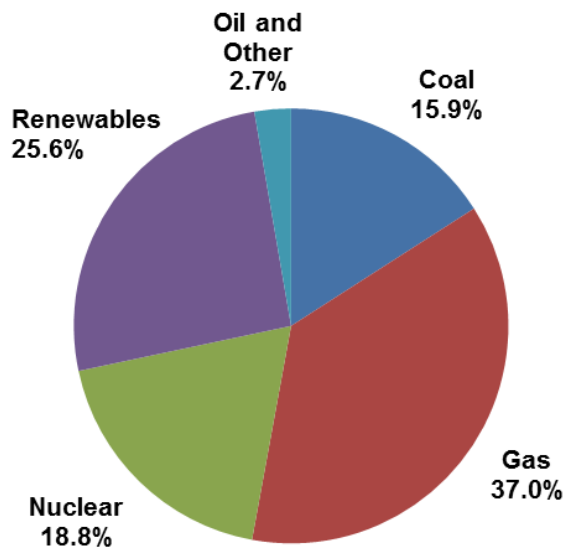
In 2017 Q1, nuclear generation increased by 1.8 per cent from 17.3 TWh to 17.6 TWh.

Wind and solar PV generation rose 10.7 per cent from 13.0 TWh to 14.4 TWh due to increased wind and solar capacity, which was slightly offset by a 6.2 per cent fall in average wind speeds and a 5.5 per cent fall in daily sun hours. Hydro generation fell by 15 per cent from 2.1 TWh to 1.8 TWh due to a 25 per cent decrease in rainfall compared with a year earlier.

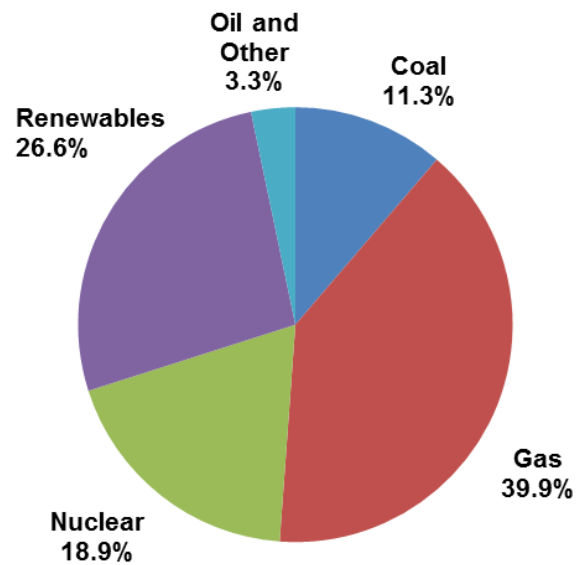
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Chart 5.2 Shares of electricity generation ([Table 5.1](#))

Q1 2016



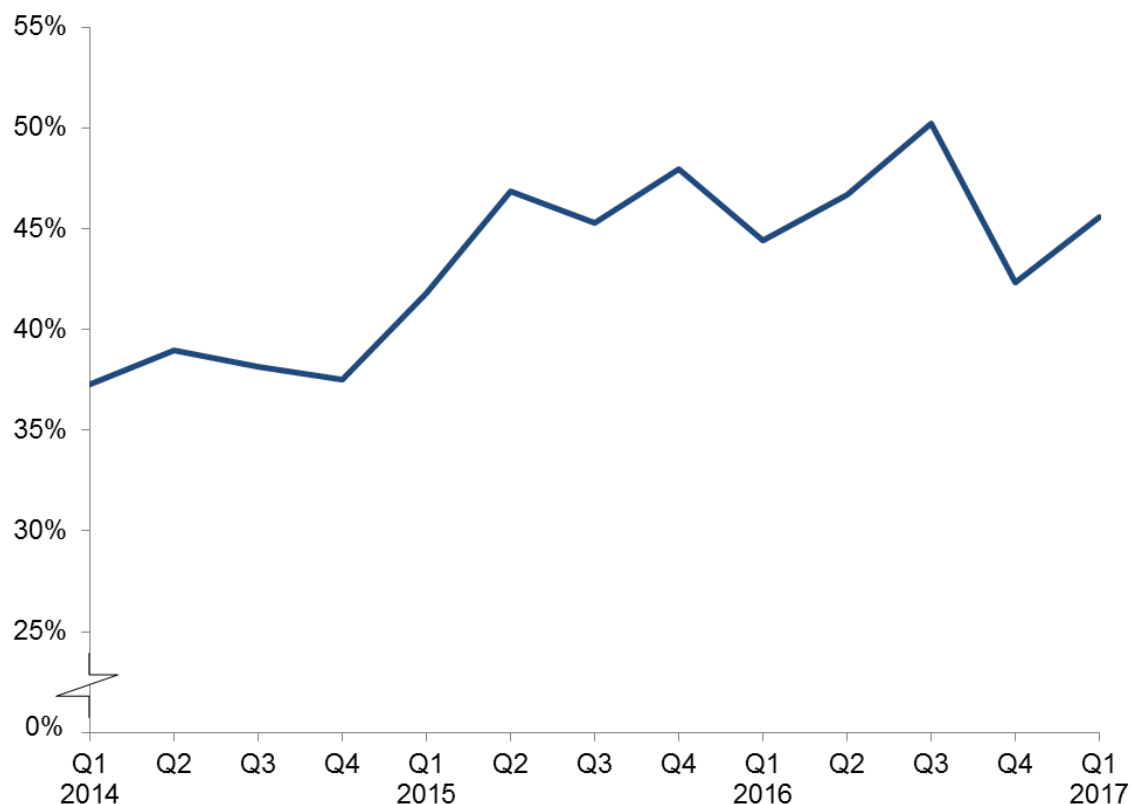
Q1 2017



The share of generation from coal decreased from 15.9 per cent in 2016 Q1 to 11.3 per cent in 2017 Q1. Gas's share of generation increased from 37.0 per cent in 2016 Q1 to 39.9 per cent in the same period, again due to decreased coal capacity and a market preference for gas generation due to the higher carbon price levy cost of coal generation.

Nuclear's share of generation increased from 18.8 per cent in 2016 Q1 to 18.9 per cent in 2017 Q1.

The share of renewables (hydro, wind and other renewables) increased from 25.6 per cent in 2016 Q1 to 26.6 per cent in 2017 Q1. This was mostly due to increased generation capacity in wind and solar.

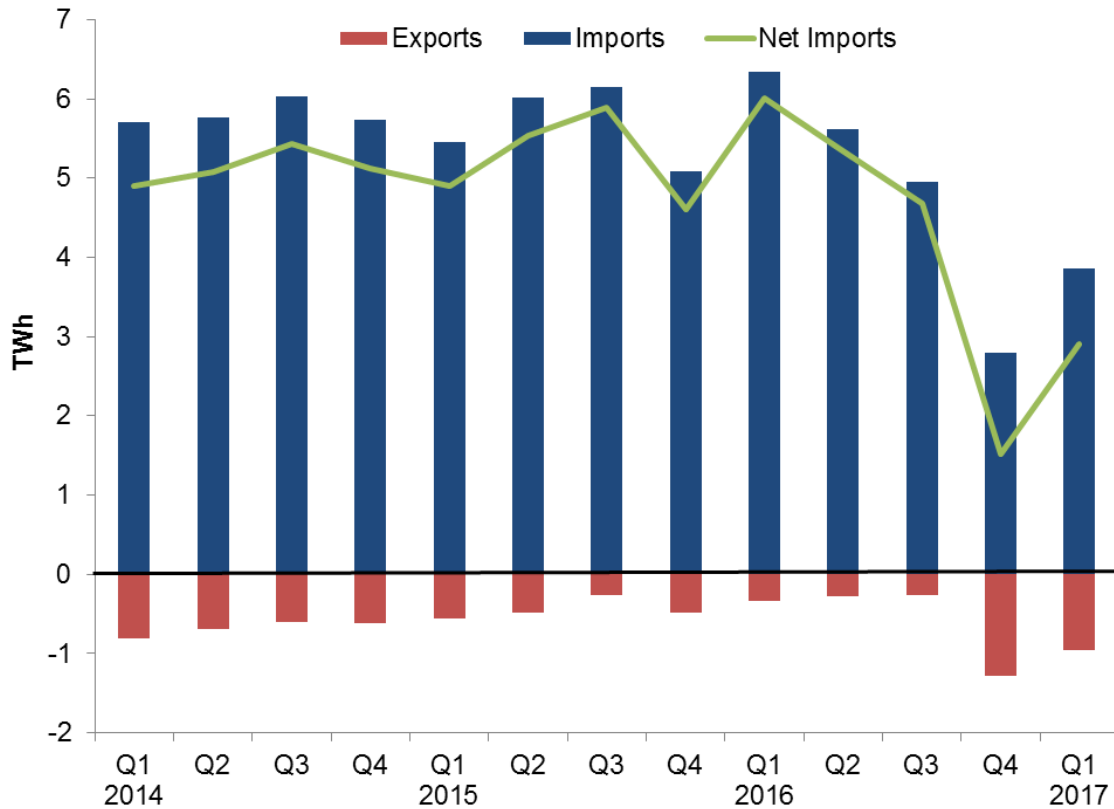
Chart 5.3 Low carbon electricity's share of generation ([Table 5.1](#))

Low carbon electricity generation includes nuclear, wind, solar, hydro and thermal renewable generation. Since renewable generation is affected by weather conditions including wind speeds, daily sun hours and volume of rainfall, this means that increased renewables capacity does not necessarily lead to increased low carbon generation share.

Low carbon electricity's share of generation increased from 44.4 per cent in 2016 Q1 to 45.6 per cent in 2017 Q1, largely due to higher renewables generation. This was mostly due to a 16.7 per cent increase in wind capacity and a 12.9 per cent increase in solar capacity.

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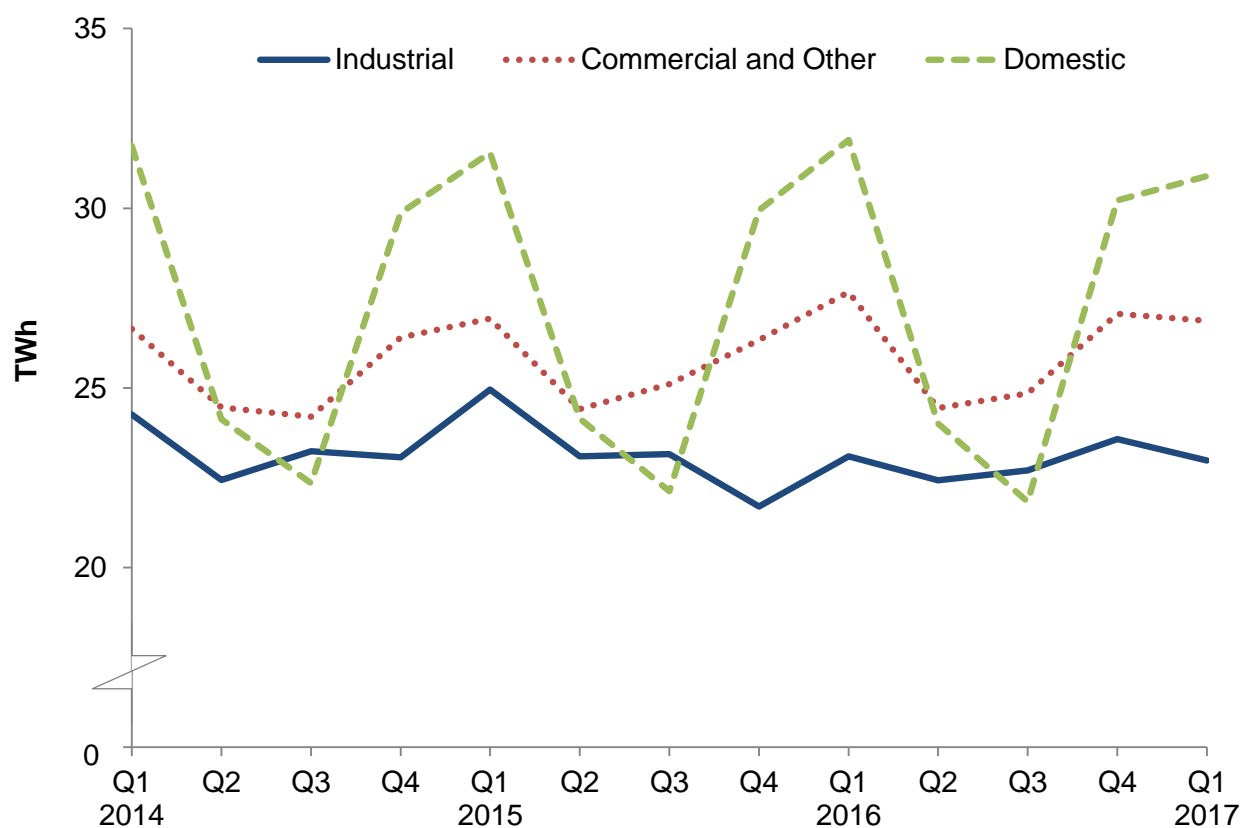
Chart 5.4 UK trade in electricity (Table 5.6)



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 2017 Q1, compared with the same period in 2016, imports of electricity fell by 39 per cent (-2.5 TWh) to 3.9 TWh, whilst exports increased by around 3 times (+0.6 TWh). The unusually low volume of imports in Q4 2016 and Q1 2017 was due to damage to the UK-France interconnector caused by a ship's anchor in November 2016. The increase in exports was mostly due to increased demand from France following a number of nuclear outages.

The UK has been a net importer of electricity since 2010 Q1. In 2017 Q1, net imports of electricity were 2.9 TWh, 52 per cent lower than 6.0 TWh in 2016 Q1. Net imports represented 3.0 per cent of electricity supplied in 2017 Q1, with net imports of 0.6 TWh from France and 1.8 TWh from the Netherlands.

Chart 5.5 Electricity final consumption ([Table 5.2](#))

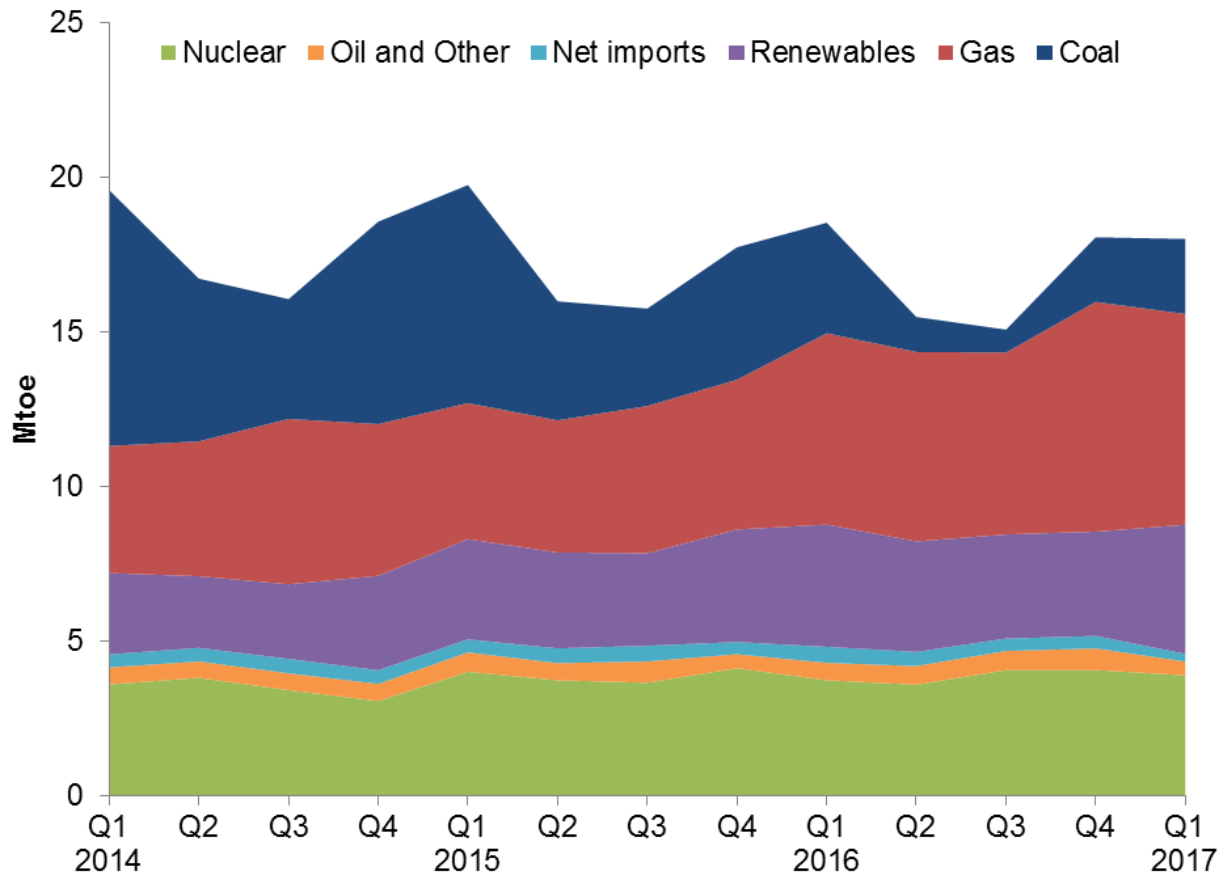
Final consumption of electricity fell by 2.3 per cent in 2017 Q1, from 82.7 TWh in 2016 Q1, to 80.7 TWh.

Domestic consumption fell by 3.2 per cent, from 31.9 TWh in 2016 Q1 to 30.9 TWh in 2017 Q1. Temperatures were on average 0.7 degrees higher than in 2016 Q1 – see Energy Trends table 7.1 at: www.gov.uk/government/statistics/energy-trends-section-7-weather.

In 2017 Q1 industrial use of electricity was 23.0 TWh, 0.5 per cent lower than the same period in 2016. Consumption by commercial and other users was 26.9 TWh, 2.9 per cent lower.

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Chart 5.6 Fuel used for electricity generation (Table 5.1)



Fuel used by generators in 2017 Q1 fell 3.2 per cent, from 18.5 mtoe in 2016 Q1 to 17.9 mtoe in 2017 Q1 (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 Q1, coal use was 32 per cent lower than in 2016 Q1, while gas use was 10.2 per cent higher than a year earlier as generation switched from coal to gas. Coal accounted for 13.5 per cent of all fuel use in 2017 Q1, a record Q1 low.

Nuclear sources were 1.8 per cent higher. Renewables (hydro, wind, solar and thermal renewables) accounted for 23.4 per cent of all fuel used.

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Table 5.1. Fuel used in electricity generation and electricity supplied

	2015	2016 p	per cent change	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter	2016 2nd quarter	2016 3rd quarter	2016 4th quarter	2017 1st 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	7.06	3.85	3.15	4.28	3.58	1.13	0.74	2.09	2.43	-32.2
Oil	0.61	0.58	-3.6	0.14	0.13	0.17	0.17	0.11	0.15	0.16r	0.16r	0.18	+67.1
Gas	18.28	25.63	+40.2	4.40	4.28	4.76	4.85	6.19	6.13	5.88r	7.43r	6.82	+10.2
Nuclear	15.48	15.41	-0.4	4.00	3.72	3.64	4.11	3.73	3.58	4.05	4.06	3.79	+1.8
Hydro	0.54	0.46	-14.4	0.17	0.12	0.09	0.16	0.18	0.08	0.10r	0.10r	0.15	-15.0
Wind and Solar ²	4.12	4.11	-0.2	1.10	0.98	0.85	1.18	1.12	0.96	1.03r	1.00r	1.24	+10.7
Bioenergy ³	8.32	9.99	+20.0	1.97	1.99	2.05	2.31	2.66	2.54	2.25r	2.55r	2.80	+5.5
Other fuels	1.71	1.90	+10.7	0.49	0.43	0.51	0.28	0.46	0.45	0.45	0.54	0.27	-41.3
Net imports	1.80	1.78	-1.1	0.42	0.48	0.51	0.40	0.52	0.46	0.40	0.40	0.25	-51.6
Total all generating companies	69.20	67.41	-2.6	19.74	15.98	15.75	17.73	18.53	15.48	15.07r	18.33r	17.93	-3.2
ELECTRICITY GENERATED													
All generating companies													
	TWh												
Coal	75.88	30.71	-59.5	29.55	16.01	12.83	17.48	14.69	4.58	2.72	8.72r	10.52	-28.4
Oil	2.04	1.84	-9.7	0.52	0.42	0.54	0.55	0.34	0.56	0.44r	0.50r	0.83	(+)
Gas	99.88	143.36	+43.5	23.63	23.48	26.56	26.20	34.11	34.49	32.67r	42.10r	37.16	+9.0
Nuclear	70.34	71.73	+2.0	18.17	16.92	16.56	18.69	17.34	16.66	18.86	18.87	17.64	+1.8
Hydro (natural flow)	6.30	5.39	-14.4	2.01	1.43	1.03	1.83	2.09	0.94	1.15r	1.21r	1.77	-15.0
Wind and Solar ²	47.86	47.79	-0.2	12.79	11.45	9.93	13.69	13.02	11.13	11.96r	11.67r	14.41	+10.7
- of which, Offshore ⁶	17.42	16.41	-5.8	4.68	3.58	3.41	5.76	5.15	3.25	3.58r	4.42r	5.01	-2.7
Bioenergy ³	29.24	30.04	+2.7	6.95	7.01	7.06	8.22	8.52	7.70	6.22r	7.60r	8.65	+1.4
Pumped Storage	2.74	2.96	+8.0	0.72	0.65	0.65	0.71	0.76	0.69	0.69r	0.82r	0.79	+3.8
Other fuels	4.64	5.57	+20.2	1.20	1.16	1.17	1.11	1.40r	1.30r	1.34r	1.53r	1.43	+2.4
Total all generating companies	338.92	339.40	+0.1	95.56	78.53	76.34	88.49	92.27	78.04	76.06r	93.03r	93.21	+1.0
ELECTRICITY SUPPLIED⁴													
All generating companies													
	TWh												
Coal	71.99	29.14	-59.5	28.04	15.19	12.17	16.58	13.94	4.34	2.58	8.28r	9.98	-28.4
Oil	1.85	1.67	-9.7	0.47	0.38	0.49	0.50	0.30	0.51	0.40r	0.46r	0.77	(+)
Gas	98.00	140.84	+43.7	23.19	23.02	26.06	25.73	33.56	33.87	32.07r	41.34r	36.49	+8.7
Nuclear	63.89	65.15	+2.0	16.51	15.37	15.04	16.98	15.75	15.13	17.13	17.14	16.03	+1.8
Hydro	6.25	5.35	-14.4	2.00	1.41	1.02	1.82	2.07	0.93	1.14r	1.20r	1.76	-15.1
Wind and Solar ²	47.87	47.79	-0.2	12.79	11.45	9.93	13.69	13.02	11.13	11.96r	11.67r	14.41	+10.7
- of which, Offshore ⁶	17.42	16.41	-5.8	4.68	3.58	3.41	5.76	5.15	3.25	3.58r	4.42r	5.01	-2.7
Bioenergy ³	25.38	26.02	+2.5	6.03	6.08	6.12	7.15	7.41	6.69	5.34r	6.58r	7.52	+1.4
Pumped Storage (net supply) ⁵	-0.98	-1.07	+8.6	-0.25	-0.23	-0.25	-0.25	-0.27	-0.26	-0.23r	-0.30r	-0.29	+5.6
Other fuels	4.30	5.16	+20.1	1.11	1.07	1.09	1.03	1.30	1.20	1.25r	1.42r	1.33	+2.4
Net imports	20.94	17.55	-16.2	4.91	5.54	5.89	4.60	6.00	5.35	4.68	1.51	2.90	-51.6
Total all generating companies	339.49	337.59	-0.6	94.80	79.29	77.57	87.83	93.08	78.88	76.33r	89.30r	90.89	-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>												
	2015	2016 p	Per cent change	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter	2016 1st quarter	2016 2nd quarter	2016 3rd quarter	2016 4th quarter	2017 1st quarter p	Per cent change ¹
SUPPLY													
Indigenous production	338,917r	339,398	+0.1	95,559	78,533r	76,337	88,489r	92,267	78,039r	76,062r	93,029r	93,209	+1.0
Major power producers ^{2,3}	293,251	289,985	-1.1	84,265	66,645	64,903	77,438	80,565	65,450r	63,025r	80,945r	80,539	-
Auto producers	42,926	46,453	+8.2	10,571	11,238r	10,780	10,337r	10,940r	11,900r	12,345r	11,268r	11,879	+8.6
Other sources ⁴	2,739	2,959	+8.0	723	650	653	714	762	689	693	815	791	+3.8
Imports	22,716	19,699	-13.3	5,462	6,023	6,152	5,080	6,334	5,622	4,951	2,792	3,863	-39.0
Exports	1,778	2,153	+21.1	555	484	259	480	331	275	268	1,279	960	(+)
Transfers	-	-	-	-	-	-	-	-	-	-	-	-	-
Total supply	359,855	356,943	-0.8	100,466	84,072r	82,230	93,088r	98,271	83,386r	80,745r	94,543r	96,112	-2.2
Statistical difference	1,192	194	-	238	307r	193	455r	85	186r	120r	-26r	53	-
Total demand	358,663	356,749	-0.5	100,228	83,765	82,037	92,633	98,356	83,200r	80,625r	94,568r	96,059	-2.3
TRANSFORMATION													
Energy industry use ⁵	27,896	26,631	-4.5	7,535	6,615	6,592	7,154	6,974	6,297r	6,273r	7,087r	6,969	-0.1
Losses	27,319	26,323	-3.6	9,256	5,499	5,065	7,499	8,713	6,016r	4,969r	6,624r	8,348	-4.2
FINAL CONSUMPTION													
Iron & steel	3,688	2,847	-22.8	990	935	887	875	708	703	707	730r	714	+1.0
Other industries	89,219	88,961	-0.3	23,969	22,156	22,267	20,827	22,387	21,728r	22,000r	22,845r	22,268	-0.5
Transport	4,516	4,669	+3.4	1,129	1,129	1,129	1,129	1,167	1,167	1,167	1,167	1,167	-
Domestic	107,764	107,971	+0.2	31,546	24,148	22,124	29,947	31,904	24,014	21,831r	30,222r	30,894	-3.2
Other final users	98,262	99,347	+1.1	25,804	23,282	23,974	25,202	26,502	23,274	23,679	25,892r	25,698	-3.0
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).