Section 5 – UK Electricity
January to March 2019

Key results show:

Total electricity supply and demand decreased by 5.9 and 6.0 per cent in Q1 2019 on Q1 2018, resulting in total generation decreasing to 86.9 TWh. (**Chart 5.1**).

Renewables share of generation increased to 35.8 per cent in Q1 2019 – a record high for Q1 and the second highest quarterly renewables share. The increase in renewable generation is largely due to increased capacity. Wind and solar's share of generation reached a record high of 23.6 per cent. (**Chart 5.2**).

Low carbon's share of generation increased to 51.8 per cent in Q1 2019 - a record high share for low carbon for Q1. This increase resulted from increased renewable generation, due to the reduced generation and share from nuclear, as a result of outages. (**Chart 5.3**).

The share of generation from fossil fuels decreased to 45.8 per cent in Q1 2019 – a record low for the quarter. This resulted from total fossil fuel generation decreasing 13 per cent to 39.8 TWh. Coal's share of generation decreased to a record low of 3.5 per cent. Meanwhile, the share of generation from gas increased to 41.9 per cent. (**Chart 5.2**).

The shift in fuel mix from fossil fuels to more renewable sources, along with the demand reduction, led to an 8.9 per cent reduction in fuel used in Q1 2019. The most significant reduction was a 63 per cent reduction in coal use for generation (**Chart 5.6**).

During Q1 2019, the new interconnector with Belgium (NEMO) became fully operational. The UK's net imports reached a record high of 6.0 TWh in Q1 2019. This increase was driven by a 16 per cent increase in imports; however, exports also increased 56 per cent. (**Chart 5.4**).

Total demand in Q1 2019 decreased, partly due to a 5.0 per cent reduction in final consumption compared to Q1 2018. This reduction occurred in all sectors. Most notably, domestic consumption decreased by 7.9 per cent in Q1 2019 compared to the previous year, due to warmer temperatures. (**Chart 5.5**).

Relevant tables

5.1: Fuel used in electricity generation and electricity supplied
5.2: Supply and consumption of electricity

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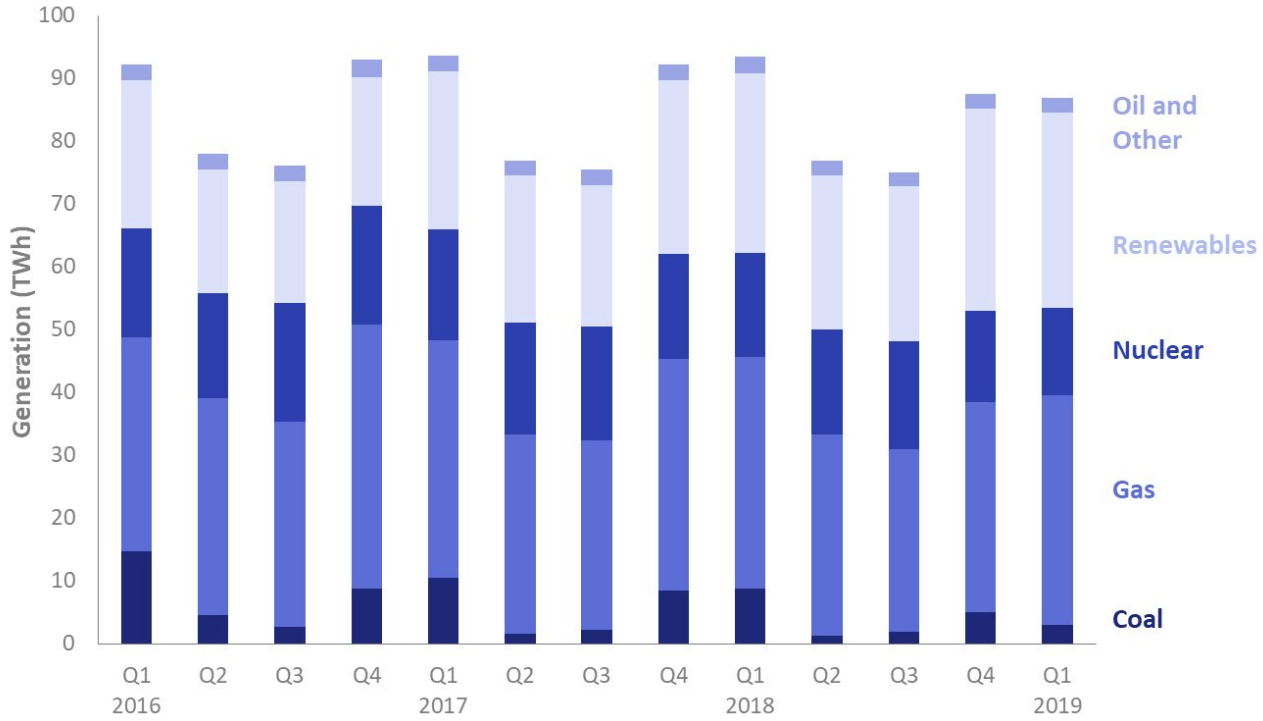
Chart 5.1 Electricity generated by fuel type (Table 5.1)



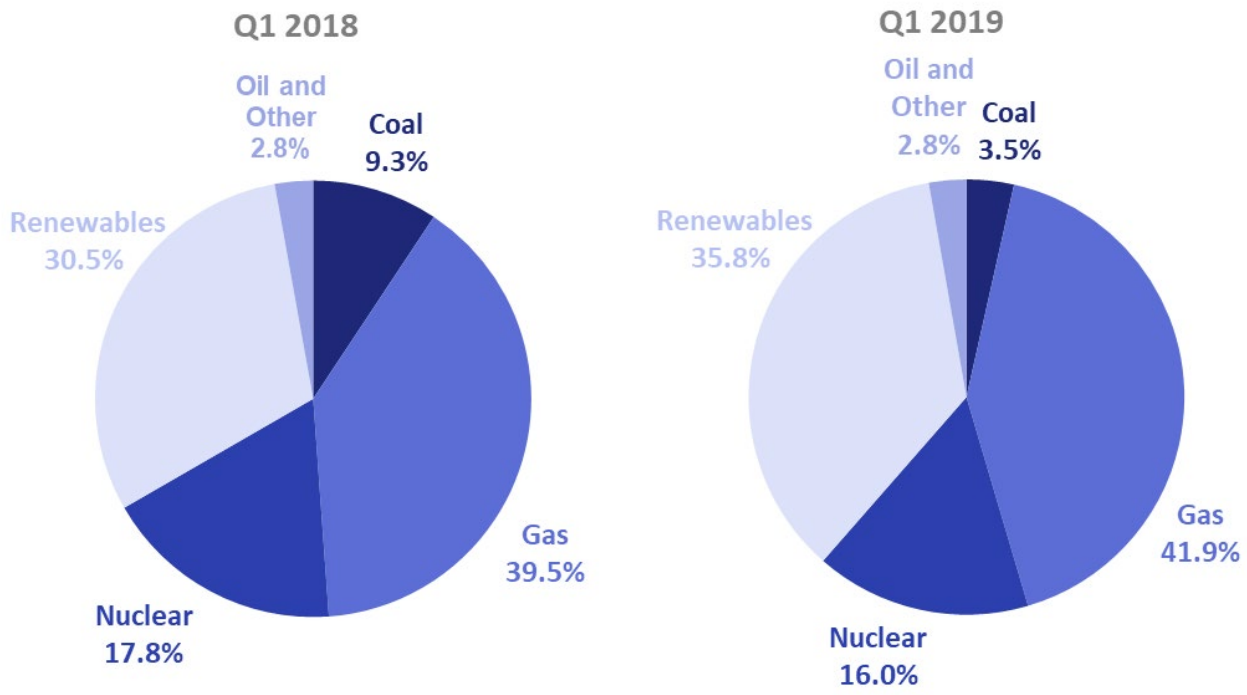
Total electricity generation fell 6.9 per cent in Q1 2019 compared to Q1 2018, reaching the lowest level of any previous Q1 at 86.9 TWh. This was in line with a significant drop in demand compared to Q1 2018, when the 'Beast from the East' led to much higher electricity consumption. Further temperatures in Q1 2019 were 1.1 degrees Celsius warmer than the long-term mean, contributing to reduced demand. Major Power Producers (MPPs) saw an 8.6 per cent fall in total generation, whilst generation from other generators (which includes autogenerators as well as domestic solar PV) rose 3.5 per cent.

Renewable generation, comprised of wind, solar, hydro and bioenergy, was 31.1 TWh in Q1 2019 and was the second highest on record – this was slightly lower than the record of 32.2 TWh in Q4 2018. This was an 9.2 per cent increase on Q1 2018, as generation from wind, solar, hydro and bioenergy all rose – see Chapter 6 for more information on renewable electricity generation. Bioenergy increased 13 per cent on Q1 2018. This was partly due to an 18 per cent rise in capacity, but it was added to by outages at Drax in Q1 2018, which limited overall bioenergy generation in that quarter. Wind and solar generation increased 7.1 per cent to a new record high of 20.5 TWh, despite weather conditions remaining broadly similar to Q1 2018. Instead, the rise was due to significant increases in capacity for both wind (up 7.8 per cent) and solar (up 3.9 per cent). Meanwhile, hydro (natural flow) generation increased 15 per cent on Q1 2018, despite a 6.5 per cent fall in average rainfall. The rise was likely due to an exceptionally wet March, which led to a spike in MPP hydro generation in that month. For further information on weather conditions, see Energy Trends tables 7.1 to 7.4.

Generation from fossil fuels fell 13 per cent from 46.0 TWh in Q1 2018 to 39.8 TWh in Q1 2019. This was driven by a 65 per cent reduction in coal generation, as higher renewable generation and lower demand significantly reduced the need for coal-fired generation. In comparison, gas generation remained much more stable, falling 1.3 per cent from Q1 2018. Gas generation varied a lot over the quarter; January saw the highest MPP gas generation since January 2017 due to a jump in demand, but February and March saw much lower generation as demand fell and renewable generation increased.

Nuclear generation fell 16 per cent on Q1 2018, reaching its lowest level since Q3 2010 at 13.9 TWh. This was due to outages at several reactors significantly reducing overall nuclear generation for the quarter.

Chart 5.2 Shares of electricity generation (Table 5.1)

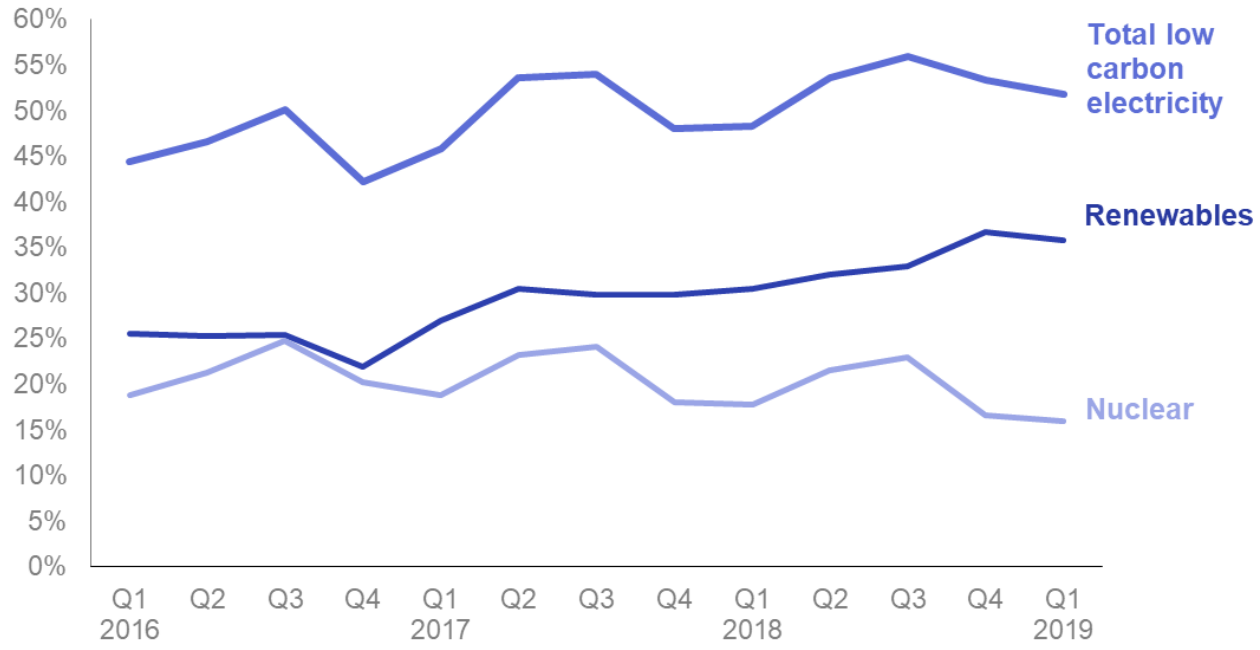


The share of electricity generated from renewables (wind, solar, hydro and other renewables) was 35.8 per cent in Q1 2019, up from 30.5 per cent in Q1 2018, after renewable technologies saw sizeable increases in generation. Wind and solar accounted for a record 23.6 per cent of total generation, up 3.1 pp on Q1 2018, as both technologies saw significant increases in capacity. Although average wind speeds were 4.1 per cent lower for the quarter, in March 2019 wind speeds were exceptionally high, leading to a spike in MPP wind generation. Bioenergy's generation share also increased, rising from 8.3 per cent in Q1 2018 to 10.1 per cent in Q1 2019.

The share of generation from fossil fuels (gas, coal and oil) fell to 45.8 per cent from 49.2 per cent in Q1 2018 – see Table 5.1 for share calculations. This was driven by a large reduction in coal generation; coal accounted for 3.5 per cent of electricity generation in Q1 2019, down from 9.3 per cent in Q1 2018. Meanwhile, despite gas generation falling in absolute terms, its share of generation increased slightly in Q1 2019 to 41.9 per cent from 39.5 per cent in Q1 2018.

Nuclear accounted for 16.0 per cent of total generation in Q1 2019, falling 1.8 pp from Q1 2018 to its lowest level since Q4 2014. This was due to a continued unplanned outage at Hunterston B and a statutory outage at Dungeness B, which stopped generation at both sites for the entire quarter. The capacity of these two power stations accounts for 23.0 per cent of nuclear capacity.

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



The share of electricity generation from low carbon sources increased to 51.8 per cent in Q1 2019, up from 48.3 per cent in Q1 2018. This rise was driven by higher generation from renewables, as their share of generation increased 5.3 pp from Q1 2018 to 35.8 per cent in Q1 2019. This was due to a combination of increased wind and bioenergy capacity (up 7.8 and 18 per cent, respectively) and particularly favourable weather conditions in March 2019.

Meanwhile, nuclear's share of generation fell from 17.8 per cent in Q1 2018 to 16.0 per cent in Q1 2019, after outages at several reactors limited overall nuclear generation.

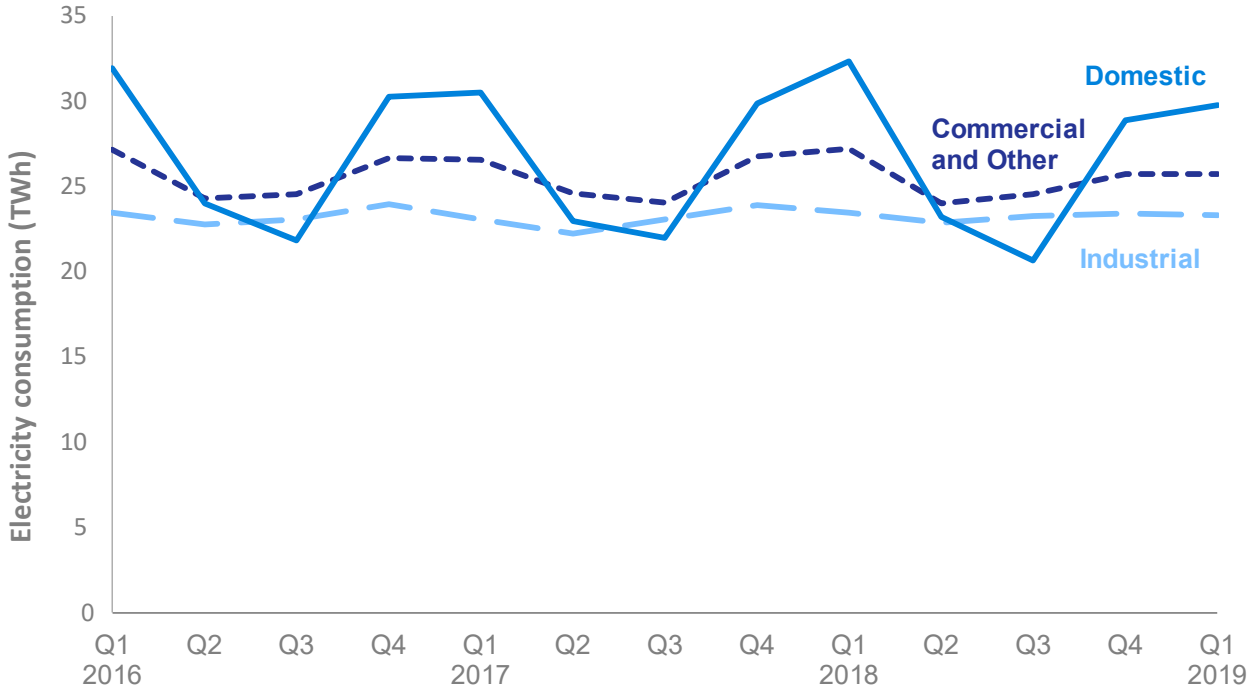
Chart 5.4 UK trade in electricity (Table 5.6)

The UK has five interconnectors allowing trade with continental Europe: England-France (2 GW capacity), England-Netherlands (1 GW), England-Belgium (1 GW), Northern Ireland-Ireland (0.6 GW) and Wales-Ireland (0.5 GW). The England-Belgium 'Nemo Link' interconnector has been included in this data for the first time after becoming fully operational on 31st January 2019.

The UK has been a net importer of electricity since Q2 2010, and in Q1 2019 net imports reached a record high 6.0 TWh, increasing 13 per cent on Q1 2018. This accounted for 6.8 per cent of total electricity supply (excluding own use) over the quarter. This was largely driven by a 16 per cent rise in total imports, after 0.9 TWh of electricity was imported across the new England-Belgium interconnector. However, total exports did also see an increase, rising 56 per cent from Q1 2018 to 0.7 TWh in Q1 2019.

Net imports from the Netherlands fell slightly, down 4.0 per cent on Q1 2018, whilst net imports from France remained relatively stable, increasing 0.4 per cent. There were significant rises in exports to the Republic of Ireland from both Northern Ireland (up 48 per cent) and Wales (up 70 per cent). Northern Ireland has been a net exporter of electricity to the Republic of Ireland since Q2 2017, with net exports in Q1 2019 at their highest level since Q3 2007, at 0.2 TWh. Meanwhile, the high exports from Wales meant that net imports to Wales from the Republic of Ireland remained low in Q1 2019 (0.02 TWh), after falling to practically zero in Q4 2018.

Chart 5.5 Electricity final consumption (Table 5.2)



Total demand and final consumption both reached record lows for the first quarter of 2019. In Q1 2019, total demand fell by 6.0 per cent to 92.8 TWh from 98.7 TWh in Q1 2018, driving a similar decrease in supply.

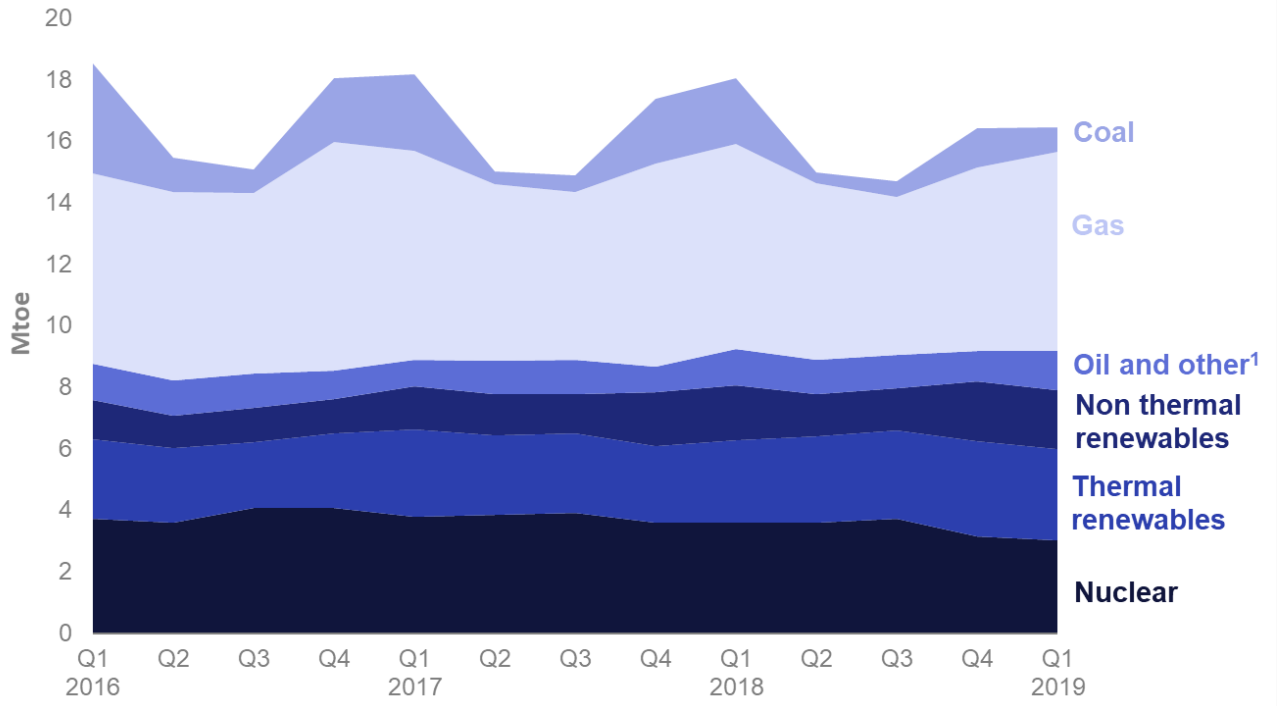
Energy industry use in Q1 2019 decreased by 11.9 per cent to 6.0 TWh from 6.8 TWh in Q1 2018. This includes electricity used in generation and for pumping, along with energy used by other fuel industries. Consistent with the decline in total demand, final consumption fell by 5.0 per cent to 78.8 TWh from 83.0 TWh in Q1 2018.

Over the first quarter of 2019, domestic consumption decreased by 7.9 per cent compared to Q1 2018, to reach 29.8 TWh. The average temperature in Q1 2019 increased by 42 per cent (4.5 degrees Celsius to 6.3 degrees Celsius), whilst the number of heating degree days fell 17 per cent (11.0 degree days to 9.2 degree days), compared to Q1 2018. This large temperature change reflected the cold snap 'the Beast from the East' in Q1 2018, but also the significantly warmer than average weather in Q1 2019, when temperatures were 21 per cent higher than the long-term mean. For more information on temperature trends, – see Energy Trends table 7.1 at: www.gov.uk/government/statistics/energy-trends-section-7-weather.

The temperature trends also contributed to consumption by other final users, which fell to 24.5 TWh in Q1 2019, decreasing by 5.7 per cent from Q1 2018. In contrast, industrial consumption decreased slightly over the quarter. In Q1 2019, industrial consumption (including iron and steel) was 23.3 TWh, compared to 23.5 TWh in Q1 2018. This decrease was smaller than the other sectors and in part reflects an increase in industrial productivity[1].

[1] Industrial productivity is measured by the Office for National Statistics in their publication of the Index of Production, available here: www.ons.gov.uk/economy/economicoutputandproductivity/output/bulletins/indexofproduction/previousReleases

Chart 5.6 Fuel used for electricity generation (Table 5.1)



1. 'Oil and other' includes the fuel use of oil, other fuels and net imports.

In Q1 2019, total fuel use by electricity generators fell to 16.4 mtoe, down 8.9 per cent on Q1 2018. This significant drop in fuel use came as a result of much lower demand compared to Q1 2018 and 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).

Coal saw by far the largest drop in fuel use, falling 63 per cent compared to Q1 2018. Gas use was more stable, but also decreased 2.9 per cent. This continues the trend of declining fossil fuel use; fossil fuel use in Q1 2019 was down 17 per cent on Q1 2018, 21 per cent on Q1 2017 and 25 per cent on Q1 2016. Nuclear also saw a reduction in use, falling 16 per cent due to several significant outages.

In contrast, thermal renewables (including bioenergy) fuel use increased 11 per cent in Q1 2019 compared to Q1 2018. This was partly due to higher bioenergy capacity (up 18 per cent on Q1 2018) but was also caused by outages at Drax in Q1 2018, which reduced overall bioenergy fuel use in that quarter. Meanwhile, non-thermal renewable generation increased 7.7 per cent on Q1 2018, as generation from wind, solar and hydro all rose.