Department for Business, Energy & Industrial Strategy

Energy Trends

UK, October to December 2020 and 2020

About this release

Information on energy production, trade, and consumption in the UK for total energy and by specific fuels.

In this release

Data tables

Additional data are available online as part of the Energy Trends series:

Total energy
Coal and derived gases
Oil and oil products
Gas
Electricity
Renewables

This publication is based on a snapshot of survey data from energy suppliers. New data are incorporated in line with the revisions policy.

Provisional annual summary

	Production	Imports	Exports	Demand
Total energy	**-3%**	**-18%**	**-8%**	**-12%**
Coal	**-35%**	**-27%**	**+76%**	**-11%**
Primary oil	**-7%**	**-23%**	**-12%**	**-19%**
Oil products	**-17%**	**-25%**	**-10%**	**-23%**
Gas	**-0%**	**-6%**	**+17%**	**-6%**
Electricity	**-4%**	**-9%**	**+32%**	**-4%**

Energy consumption in 2020 was low as COVID-19 restrictions affected economic output, leisure, and travel. **Energy requirements for industrial use and services (e.g., shops, restaurants, offices) are down 8 per cent on 2019**. Despite warmer weather, domestic demand was up 2 per cent as more people stayed at home.

Transport demand dropped 28 per cent compared to 2019, led by a fall in aviation demand, down 60 per cent. This takes us to levels last seen in the mid-1980s. Diesel demand was down 17 per cent and petrol demand down 21 per cent. With petrol and diesel taken together that also takes road transport demand back to the 1980s.

Windy conditions in the Spring of 2020 meant that renewable generation reached record levels and **contributed a 42.9 per cent share of generation, outpacing for the first-time annual fossil fuel generation** which contributed 38.5 per cent of generation, a record low and down from 75.4 per cent in 2010. Despite low output from nuclear, **strong renewable performance pushed low carbon generation to a record 59 per cent**.

Data from the fourth quarter of 2020 are broadly in line with the annual trends, with low levels of consumption (down 11 per cent on the same quarter in 2019) being driven by reduced transport and commercial demand. Renewable generation remains strong, and although not at record levels it continued to provide a greater share of generation than fossil fuels during the fourth quarter.

Section 1: UK total energy

Key headlines

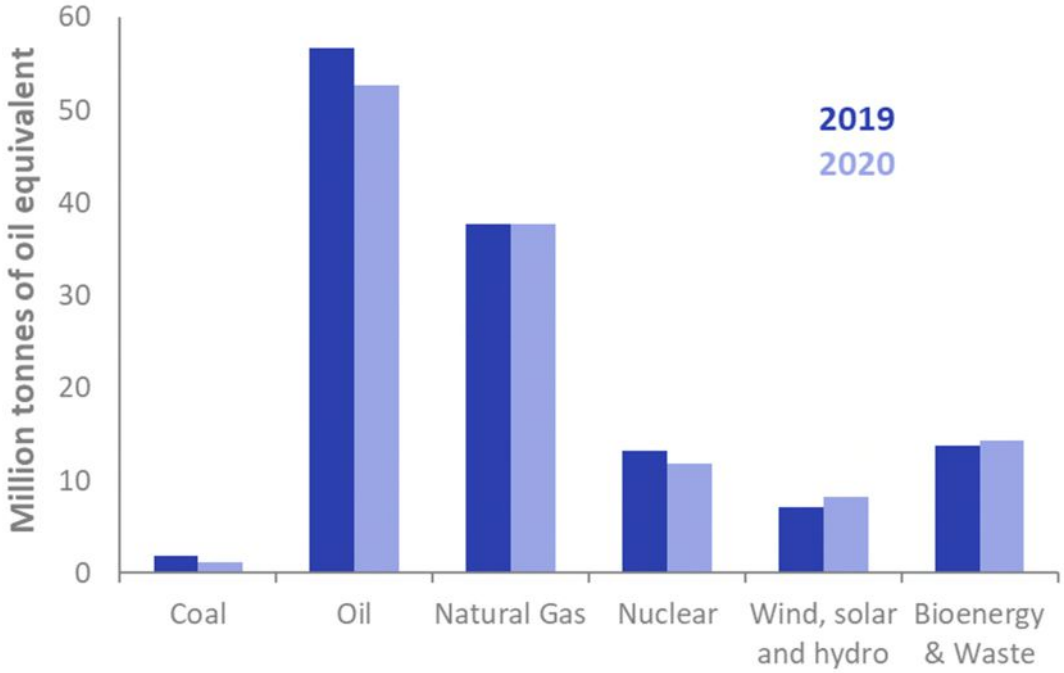
In 2020 total production was 126.0 million tonnes of oil equivalent, 3.5 per cent lower than in 2019. The most notable fall was in oil production which was mainly the result of reduced demand.

Total final energy consumption (excluding non-energy use) was 13 per cent lower than in 2019, whilst transport consumption was 28 per cent lower, both at record lows as COVID-19 restrictions reduced the demand for much of industry, commercial services and transport. On a seasonally and temperature adjusted basis, final energy consumption fell by 12 per cent with only domestic demand increasing, up 6 per cent as more people stayed at home.

In the fourth quarter of 2020 total production was 32.0 million tonnes of oil equivalent, 7.8 per cent lower than in the fourth quarter of 2019.

Final energy consumption (excluding non-energy use) fell by 11 per cent compared to the fourth quarter of 2019. Transport consumption fell by 24 per cent, other final users (mainly from the service sector) consumption fell by 8.2 per cent, industrial consumption fell by 5.3 per cent and domestic consumption fell by 0.5 per cent. On a seasonally and temperature adjusted basis, final energy consumption fell by 10 per cent, with falls in all sectors except domestic. Consumption has continued to pick up from earlier in the year but the continued impact of Covid-19 restrictions on transport demand has remained this quarter.

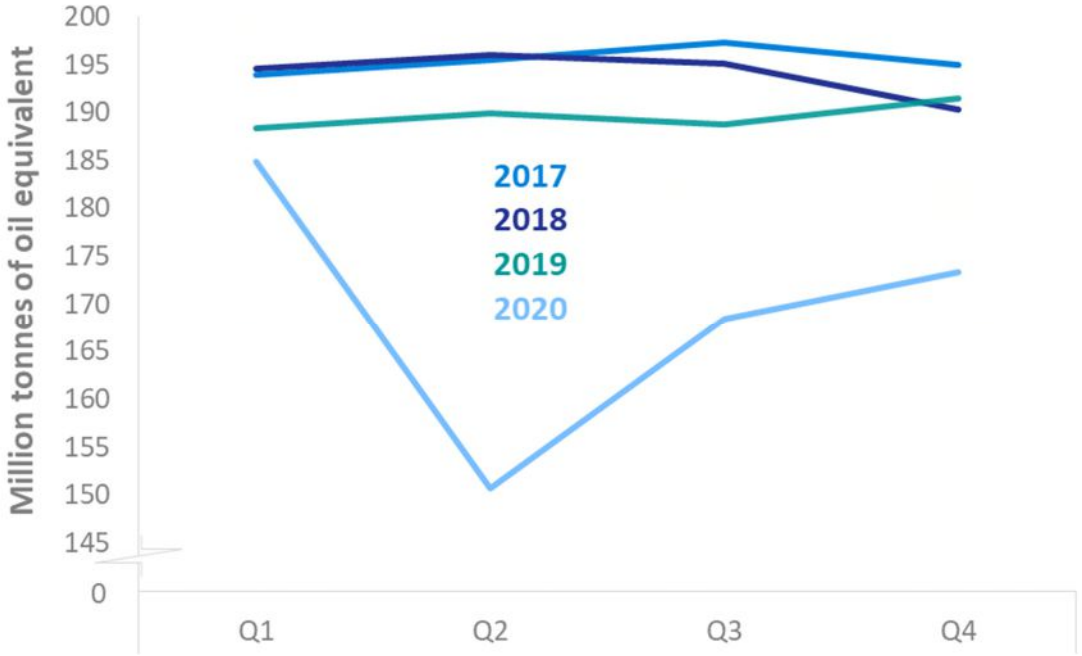
Chart 1.1 UK production



In 2020 total production was 126.0 million tonnes of oil equivalent, 3.5 per cent lower than in 2019. Growth in renewable sources (bioenergy & waste, wind, solar & hydro) was offset by reduced fossil fuel (coal, oil & gas) and nuclear output, due to reduced demand and other disruption from the Covid-19 pandemic, and numerous outages at UK nuclear power stations.

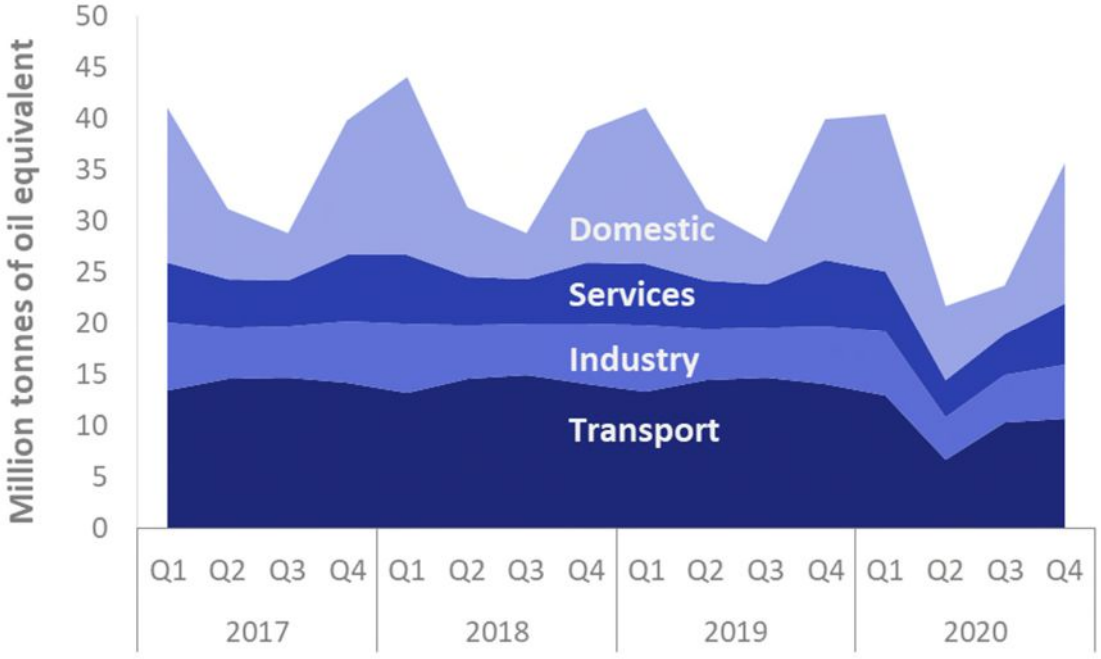
In the fourth quarter of 2020 total production was 32.0 million tonnes of oil equivalent, 7.8 per cent lower than in the fourth quarter of 2019. Production of all primary fuels fell except for wind, solar and hydro, due to growth in wind and solar capacity and more favourable weather conditions for wind generation.

Chart 1.2 Total inland consumption (primary fuel input basis)



In 2020 **total inland consumption** (this includes not only fuel use by consumers, but fuel used for electricity generation and other transformation) was 169.4 million tonnes of oil equivalent, 11 per cent lower than in 2019 – that is on a seasonally adjusted and annualised rate that removes the impact of temperature on demand. **In the fourth quarter of 2020** consumption increased 2.9 per cent on Q3 2020, as some lockdown restrictions were eased before the start of the new calendar year.

Chart 1.3 Final energy consumption by user



In **2020 total final energy consumption** (excluding non-energy use) was 13 per cent lower than in 2019, and at a record low level, with consumption levels severely impacted by the Covid-19 pandemic lockdown restrictions. Domestic consumption rose by 2.1 per cent, as more people stayed at home. Transport consumption fell by 28 per cent, also to a record low level this century, as domestic and international travel was severely limited by the lockdown restrictions. Service sector consumption fell by 8.0 per cent as many schools, shops and workplaces were forced to close, whilst industrial sector energy consumption fell by 8.5 per cent. **In the fourth quarter of 2020** total final energy consumption was 11 per cent lower than in the fourth quarter of 2019.

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Section 2: Coal and derived gases

Key headlines

Total coal demand in 2020 fell to 7.1 million tonnes, 11 per cent lower than in 2019. The decrease was driven by a drop in consumption by electricity generators, down 20 per cent to 2.3 million tonnes (a new record low) as coal-fired generation is phased out. Between 10th April and 12th August coal-fired generation was used on the GB grid for only one day. Following the closure of Fiddlers Ferry and Aberthaw B in March 2020, just four coal-fired power plants remain in the UK, with plans to phase these out by 2025.

Consumption of coal for coal-fired electricity generation fell to a new record low of 2.3 million tonnes, down 20 per cent compared to 2019.

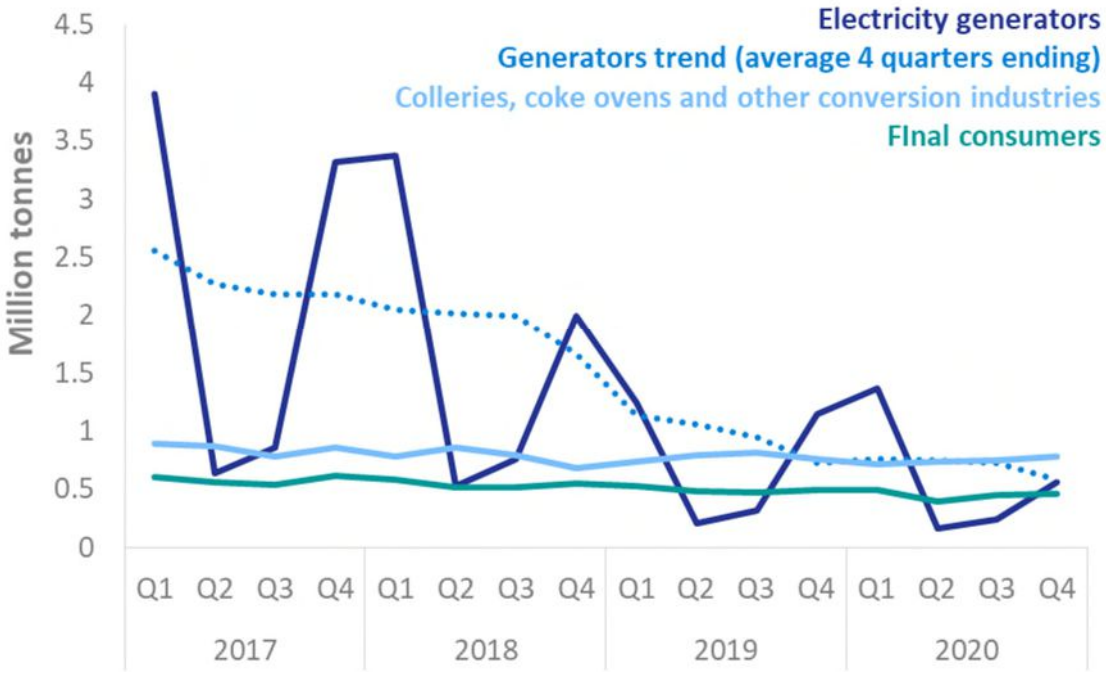
Overall coal production during 2020 fell to a record low of 1.7 million tonnes, down 35 per cent compared with 2019. Surface mining production fell to a record low of 1.6 million tonnes because of mine closures and falling demand for coal for electricity generation. In the last ten years UK coal production has fallen by 91 per cent. (Chart 2.2)

Coal imports fell to 4.5 million tonnes in 2020, 27 per cent down compared with 2019. Net imports accounted for 45 per cent of supply in 2020 (Chart 2.2). Russia (36 per cent), the USA (22 per cent) and Venezuela (21 per cent) accounted for 79 per cent of total coal imports. (Chart 2.3)

In the fourth quarter of 2020, demand for coal by electricity generators fell to 554 thousand tonnes, 51 per cent lower than in Q4 2019. This continued decline was due to high carbon prices and an increase in renewables generation. (Chart 2.1)

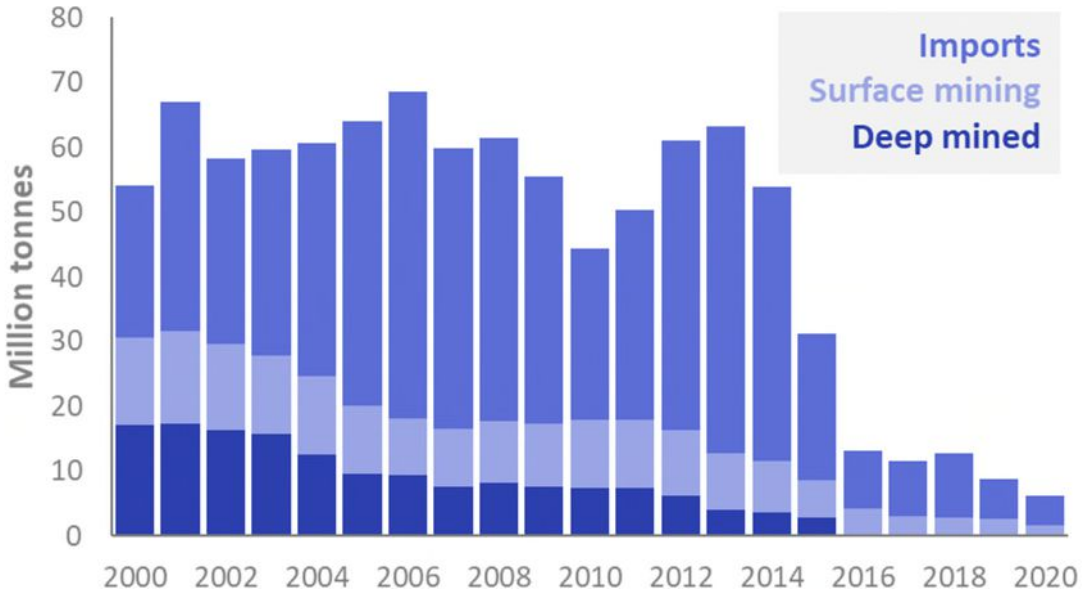
In Q4 2020, coal imports rose to 1.6 million tonnes, 29 per cent up on Q4 2019. Net imports accounted for 65 per cent of supply in Q4 2020 (Chart 2.2). Venezuela (35 per cent), Russia (30 per cent) and the USA (20 per cent) accounted for 85 per cent of total coal imports.

Chart 2.1 Coal Consumption



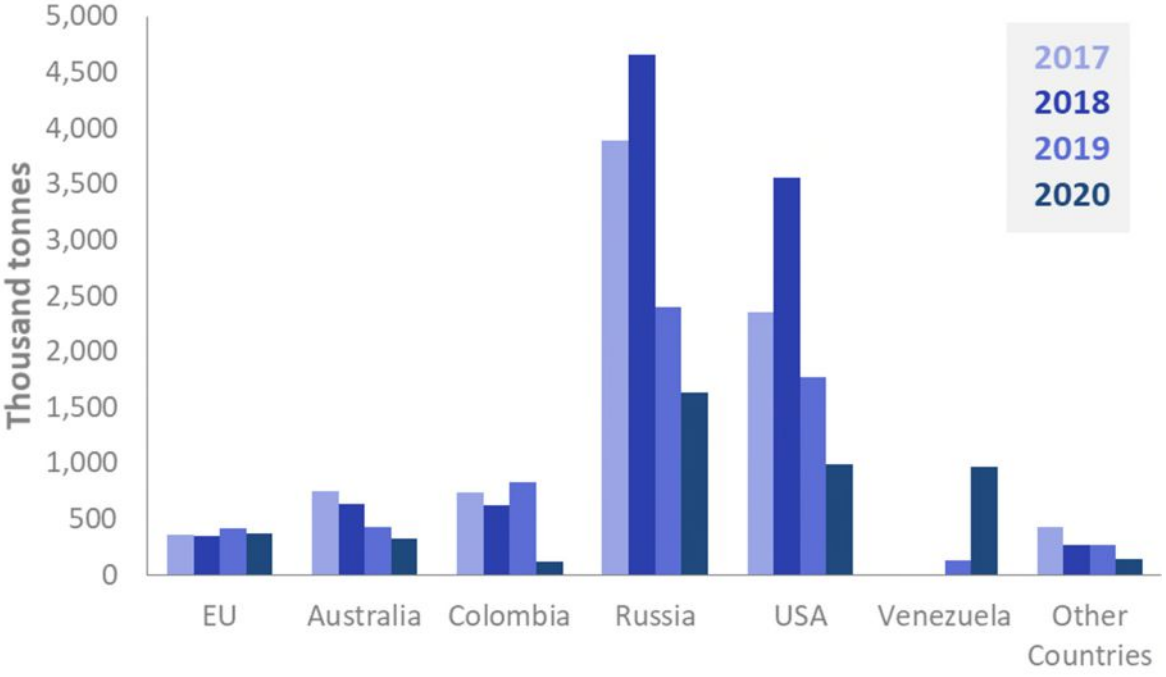
In the most recent quarter, coal demand for coal-fired electricity generation fell from 1.1 million tonnes in Q4 2019 to 0.6 million tonnes in Q4 2020, a decrease of 51 per cent. Demand for coal-fired generation is seasonal, peaking in winter when conditions are cold and dark; these peaks have declined as coal-fired generation became less competitive economically and is displaced by gas and renewable sources.

Chart 2.2 Coal Supply



Domestic coal production has fallen steadily because of coal mine closures and reduced demand. Imports filled the gap but have also fallen as overall demand dropped. Imports fell 81 per cent from 23 million tonnes in 2000 to 5 million tonnes in 2020 due to a drop in demand for coal.

Chart 2.3 Coal Imports



In 2020 Russia remained the largest exporter of coal to the UK with a share of 36 per cent. This was followed by the USA with 22 per cent. Venezuela, which had not exported any coal to the UK in 2018 had moved up to third with 21 per cent.

In Q4 2020 Venezuela (35 per cent), Russia (30 per cent) and the USA (20 per cent) accounted for 85 per cent of total coal imports.

Section 3: Oil and oil products

Key headlines

In 2020 the UK's total production of primary oils exceeded refinery demand for the first time since 2004 as refinery demand dropped because of the Covid-19 pandemic. Total demand for primary oils was down 19 per cent on 2019 with refinery production following suit and dropping to its lowest ever level.

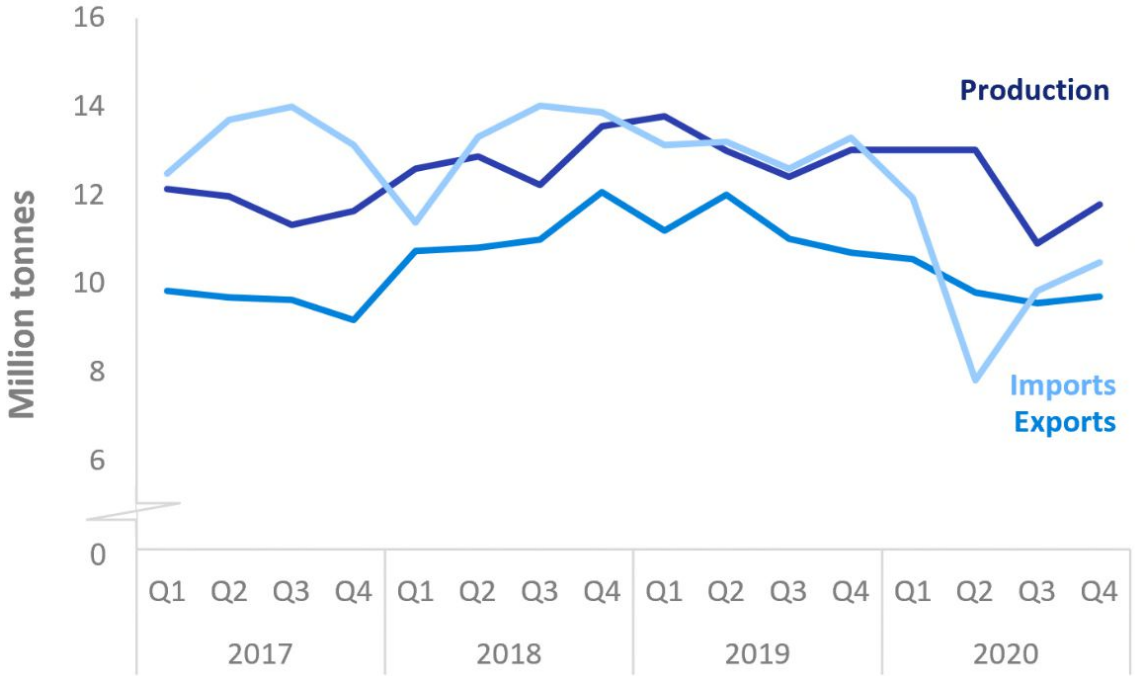
Final consumption of petroleum products, in 2020, was 24 per cent lower than in 2019. The restrictions imposed in response to the pandemic had differing effects on specific sectors. Domestic consumption saw an increase of 11 per cent, as more people stayed at home. Demand for key road fuels was significantly reduced, by 21 and 17 for petrol and diesel respectively. The biggest decrease was the contraction in demand for jet fuel, down 60 per cent on last year, the lowest level since 1984. (Chart 3.3 and Chart 3.4)

In Q4 2020 indigenous production of primary oils was down 9.5 per cent compared to Q4 2019, following delayed maintenance. Imports remain just over a fifth lower than in Q4 2019, whilst exports were down 9.3 per cent. However, there are cautious sins of recovery following increases compared to the two previous quarters.

Demand for petrol remained low, down 15 per cent in Q4 2020 compared to Q4 2019. Diesel was down 9 per cent for diesel. Demand for aviation fuel also remains low, only one-third of the levels seen in Q4 2019. As international travel restrictions were tightened demand decreased by 12 per cent following an increase in Q3 2020. (Chart 3.4)

In 2020, the Covid-19 pandemic and consequent restrictions saw total demand for primary oils fall 19 per cent compared to 2019. This is in line with global demand, which contracted for the first time in 2020 since the 2009 financial crisis.

Chart 3.1 Production and trade of crude oil and NGLs

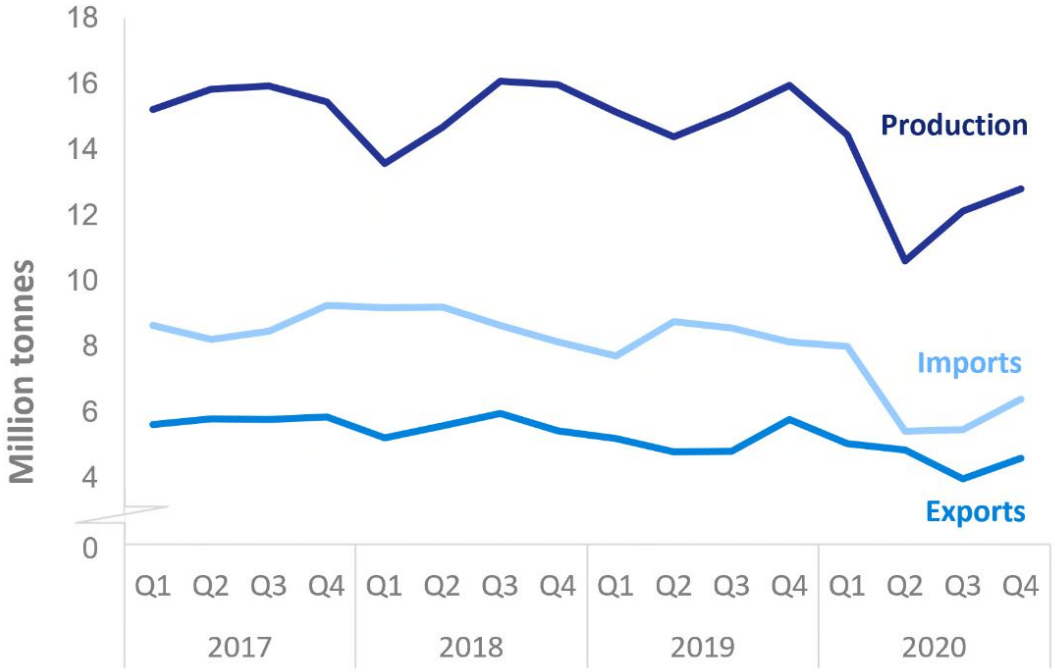


In view of reduced demand operators moved to curb production; provisional figures for 2020 show UK production of primary oils were down by 7.0 per cent on 2019. Additionally, imports and exports of primary oils were down 23 and 12 per cent respectively, as global trade and shipping reduced. This follows several years of growth since 2014 after renewed investment into several large projects on the UK Continental Shelf (UKCS).

In Q4 2020, indigenous production of primary oils was down 9.5 per cent compared to Q4 2019 following delayed maintenance. Imports of crude and NGLs were down a fifth while exports fell 6.3 per cent in Q4 2020 compared to Q4 2019; however, both were up on the previous quarter. This meant the UK was a net importer of primary oils in, by 0.8 million tonnes.

Demand for primary oils was down by more than one-fifth compared with the same period last year, although demand has increased for the second consecutive quarter by 5.7 per cent on Q3 2020 despite further restrictions to tackle a rise in Covid-19 cases.

Chart 3.2 Production and trade of petroleum products



In 2020, the Covid-19 pandemic and consequent restrictions saw total demand for petroleum products fall 23 per cent compared to 2019. In view of reduced demand refiners also moved to curb production; indigenous production of petroleum products was down 17per cent in 2020 compared to 2019, a reduction of more than 10 million tonnes, a record low.

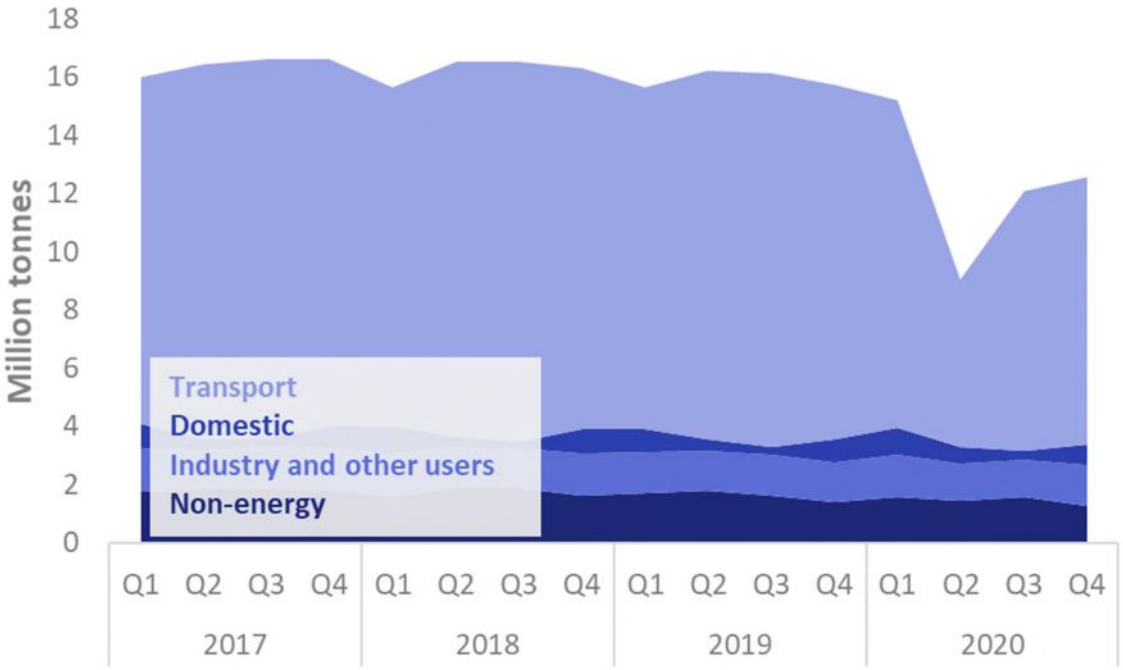
Whilst overall production was equivalent to around 95 per cent of demand, the UK produces less diesel and jet fuel than it typically needs but more petrol than it needs. The UK trades to meet demand for diesel and jet fuel, and exports excess volumes of petrol. In 2020, imports were down by 25 per cent due to reductions in transport and non-energy demand (see Charts 3.3 and 3.4). Exports were down by 10 per cent, resulting in net imports halving compared to 2019. Overall, supply of petroleum products was down 23 per cent.

In Q4 2020, total demand for petroleum products was down by just over a fifth compared to Q4 2019. This is in line with continued restrictions in place to curb the Covid-19 pandemic. Whilst demand remains down compared to 2019, Q4 has seen an increase for a second consecutive quarter despite a further national lockdown, hinting at signs of recovery.

Similarly, indigenous production of petroleum products was down 20 per cent in Q4 2020 compared to Q4 2019. Imports and exports were down 23 and 21 per cent, respectively. The UK remains a net importer of petroleum products by 1.7 million tonnes.

In 2020, restrictions on movement to combat the Covid-19 pandemic, resulted in a fall in demand of key road fuels. In 2020, transport use, which accounts for more than three-quarters of UK final consumption, was down 29 per cent compared to 2019 (see Chart 3.4).

Chart 3.3 Final consumption of oil



Demand for aviation turbine fuel was hit most severely with a decline of 60 per cent compared to 2019 due to international travel restrictions being in place for large parts of the year. Annual consumption of petrol decreased by 21 per cent while road diesel decreased by 17 per cent. This drop was greater for petrol than diesel because commercial fleets tend to be diesel engine vehicles some of which continued to run during the UK's periods of restricted movement. This is supported by DfT road traffic movement data[1] which shows a larger fall in miles travelled by car compared to heavy and light goods vehicles during the pandemic.

Domestic consumption increased by 11 per cent as more people stayed at home due to the pandemic. In addition, low oil prices in early 2020 caused by excess stocks led to a bump in demand in the summer months as consumers took advantage of lower prices for burning oil.

Industry and other final user's consumption decreased by 10 per cent and non-energy use of oil products was down by 9.2 per cent compared to 2019.

In Q4 2020, demand for petroleum products remains low, down by one-fifth compared to Q4 2019. However, demand was up 3.6 per cent on Q3 2020; the second consecutive increase after the record lows seen in Q2.

Demand for petrol marginally increased in Q4 2020 compared with Q3 2020 despite further restrictions to tackle a rise in Covid-19 cases. Demand for road diesel increased by 7.3 per cent and was met through increased imports. Conversely, tighter international travel restrictions saw jet fuel demand fall by 12 per cent compared to Q3 2020, remaining two-thirds below Q4 2019 levels. Notably domestic consumption in Q4 2020 more than doubled on Q3 2020 as customers took delivery to re-fill storage tanks as temperatures cooled.

[1] https://www.gov.uk/government/collections/road-traffic-statistics

Section 4: Gas

Demand for gas in 2020 fell by 6.2 per cent compared to 2019, to 805 TWh, the lowest level seen since 2015. This was due to restrictions in place to curb the Covid-19 pandemic. The service and industrial sectors were hard hit and demand for gas for electricity generation fell by 14 per cent in light of reduced demand for electricity in addition to increased output from renewables. Conversely, domestic demand for gas increased by 0.8 per cent to 301 TWh because of stay-at-home orders and despite warmer weather.

In 2020, imports of natural gas were down compared to 2019 at 478 TWh. Whilst pipeline imports fell by 12 percent, imports of Liquefied Natural Gas (LNG) remained substantial and increased by 4.8 per cent compared to 2019. The share of imports that were LNG reach 62 per cent in Q2 a record high. Exports increased by 17 per cent in 2020, largely due to increased exports to the Netherlands as an import pipeline was converted to an interconnector that allows two-way flows between the UK and the Netherlands.

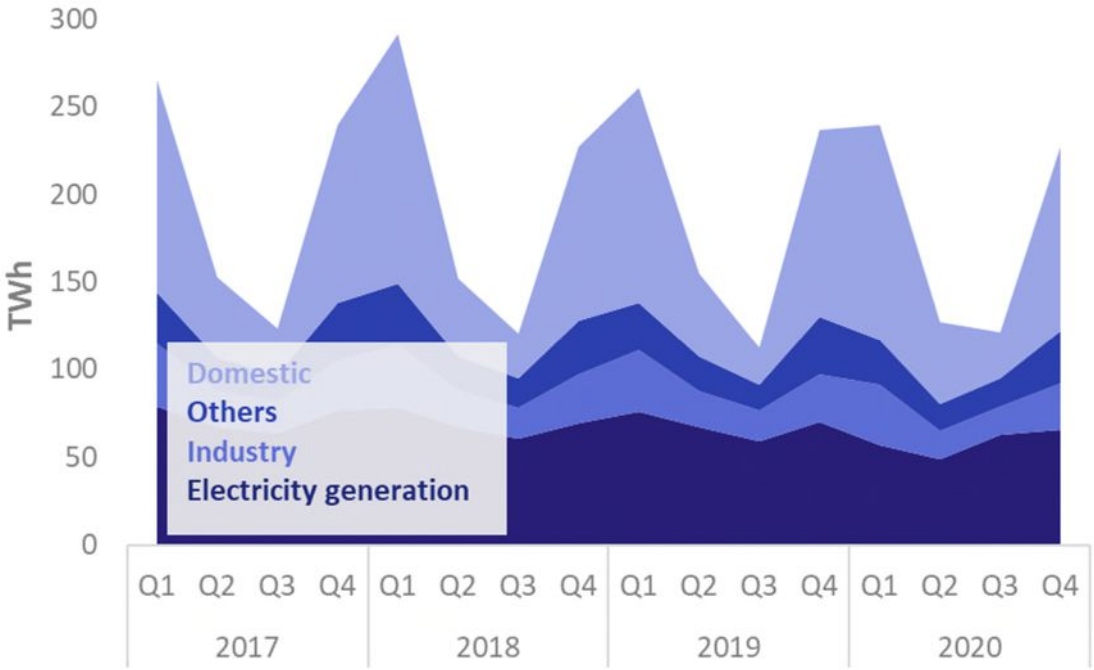
In Q4 2020, UK demand for natural gas was 252 TWh, down 4.2 percent compared to Q4 2019. This is in line with the annual trend and shows the impact of the second national lockdown and further regional restrictions in response to the Covid-19 pandemic. In addition, warm temperatures and reduced demand for electricity generation due to increased renewable output, saw a decline in demand in all sectors.

Production was down 9 per cent compared Q4 2019 following delays to maintenance earlier in the year.

Net imports were down 3.4 per cent compared to Q4 2019. Imports of LNG remain substantial but were down 39 per cent compared to Q4 2020, when near record levels were recorded.

In 2020, UK gas demand decreased by 6.2 per cent on 2019 to 805 TWh. This was due to restrictions in place to curb the Covid-19 pandemic, this most heavily impacted industry and commercial and public sectors (both of which fall under other final users, Chart 4.1).

Chart 4.1 UK demand for natural gas

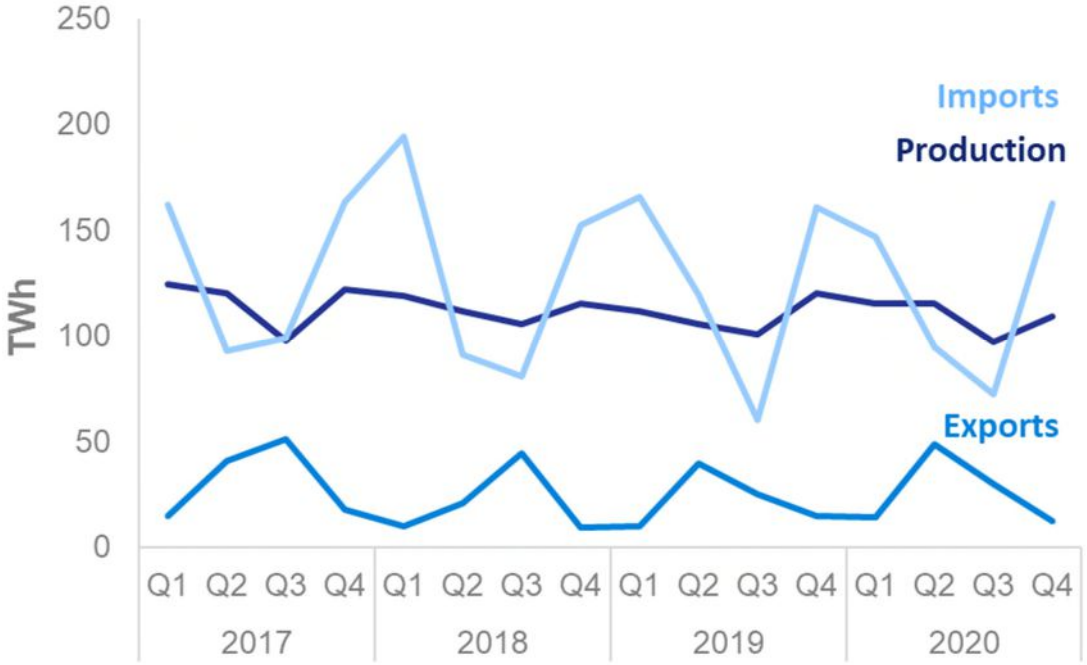


Conversely, as households changed their behaviours in line with stay-at-home orders, domestic demand saw a slight increase of 0.8 per cent; this is despite 2020 being warmer than 2019. Overall, final consumption was down 2.3 per cent in 2020.

Demand for gas used for electricity generation was down by 14 per cent to 233 TWh. This was caused by a fall in demand for electricity as well as increased renewable output.

In Q4 2020 UK demand for natural gas fell by 4.2 per cent compared with Q4 2019, broadly in line with annual trends for 2020. The impact of a second national lockdown and further regional restrictions saw a decline in demand for gas in all sectors. Demand of other final users was down 9.2 per cent on Q4 2019 showing the impact on the service sector. Domestic demand for gas fell by 1.1 per cent less than expected given warmer temperatures. Finally, demand for electricity generation fell 6.1 per cent compared to Q4 2019.

Chart 4.2 Production and trade of natural gas

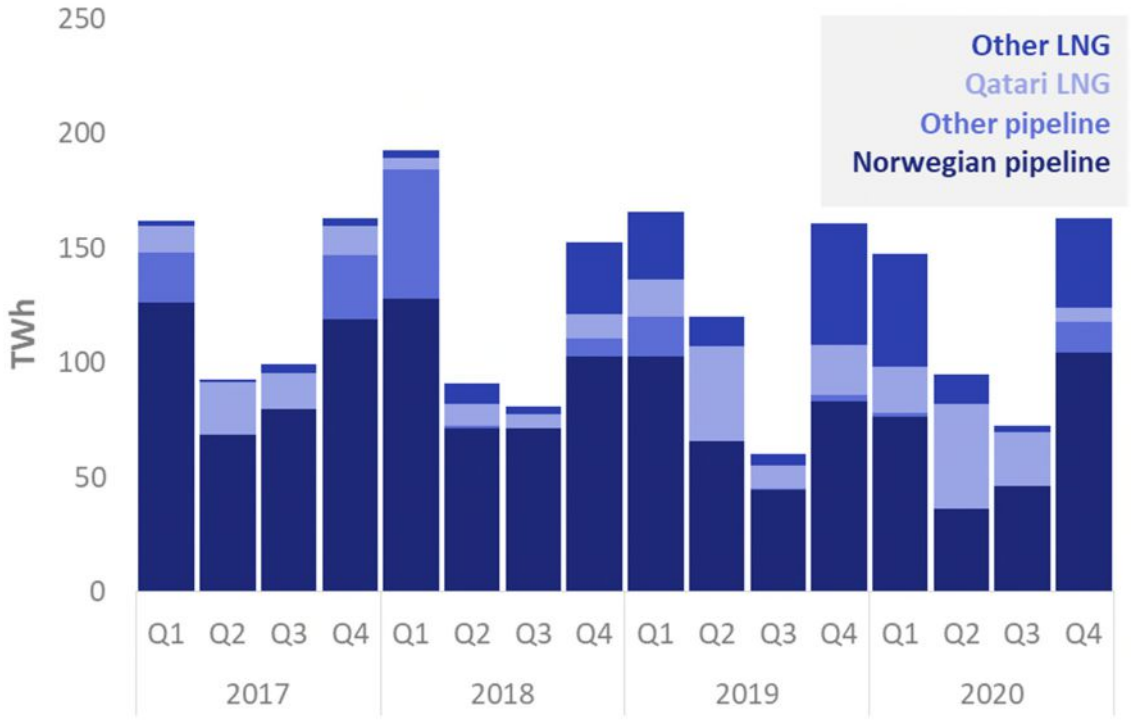


In 2020, gross gas production was stable on 2019. Maintenance which usually takes place in the summer was pushed back into Q3 as operators moved to comply with social distancing. Imports were down 5.8 per reflecting lower demand particularly for electricity generation. Conversely, exports increased by 17 per cent largely because of increased trade to the Netherlands.

The Bacton-Balgzand Line (BBL) was converted from an import pipeline to an interconnector at the end of 2019 allowing flows in both directions between the Netherlands and the UK. Substantial exports from the UK to the Netherlands began in April 2020. Exports to the Netherlands will support a UK oversupply in summer months following the closure of storage facilities and amidst declining production in the Netherlands. In 2020, this resulted in record exports to the Netherlands which were more than three times higher than in 2019.

In Q4 2020, gross gas production was down 9 per cent on Q4 2019, following delayed maintenance due to the Covid-19 pandemic. Net imports were down 3 per cent compared to Q4 2019, reflecting stable imports and a decline in exports of 15 per cent as trade between the UK and Netherlands reversed for winter.

Chart 4.3 Imports by origin



In 2020, imports from Norway were down 11 per cent on 2020. However, Norway remains the largest import source making up 55 per cent of total imports; this is down from 58 per cent in 2019 and 73 per cent in 2018. Imports from the Netherlands were down 36 per cent in line with the conversion of the BBL interconnector.

In 2020, LNG imports were substantial, increasingly marginally by 4.8 per cent compared to 2019 (see special article Supply of Liquefied Natural Gas in the UK, 2020 later in this publication). LNG made up 42 per cent of all gas imports, up from 39 per cent in 2019. Imports of LNG were particularly high in the first half of 2020, reaching 62 per cent of total imports in Q2. Qatar remains the dominant import source of LNG, contributing to 48 per cent of total LNG in 2020, stable on 2019. As new projects have come on stream, the number of LNG import sources has increased in recent years. Notably in 2020, imports from the US increased by 72 per cent on 2019. For further analysis of UK LNG in 2020 see special feature article ‘Supply of Liquefied Natural Gas in the UK, 2020’.

In Q4 2020, LNG imports were down 39 per cent compared to Q4 2020, when near record levels were recorded. Despite this LNG imports remain substantial. The US was the largest supplier of LNG to the UK, comprising 49 per cent of total LNG imports, the highest share of LNG imports for the US on record. Although typically the largest LNG supplier, Qatar's share of LNG imports fell to just 14 per cent in Q4 2020 and was only the third largest LNG supplier, behind Russia and the US.

Section 5: Electricity

Key headlines

Electricity demand and generation in 2020 were both the lowest values on their respective data series as the Covid-19 restrictions reduced demand. Final consumption of electricity was 281 TWh in 2020, a decrease of 4.7 per cent on 2019, driven by a reduction in non-domestic electricity consumption because of Covid-19 restrictions. Industrial use of electricity was down 9.0 per cent and consumption by other final users, decreased by 10.4 per cent. Domestic consumption increased by 4.0 per cent.

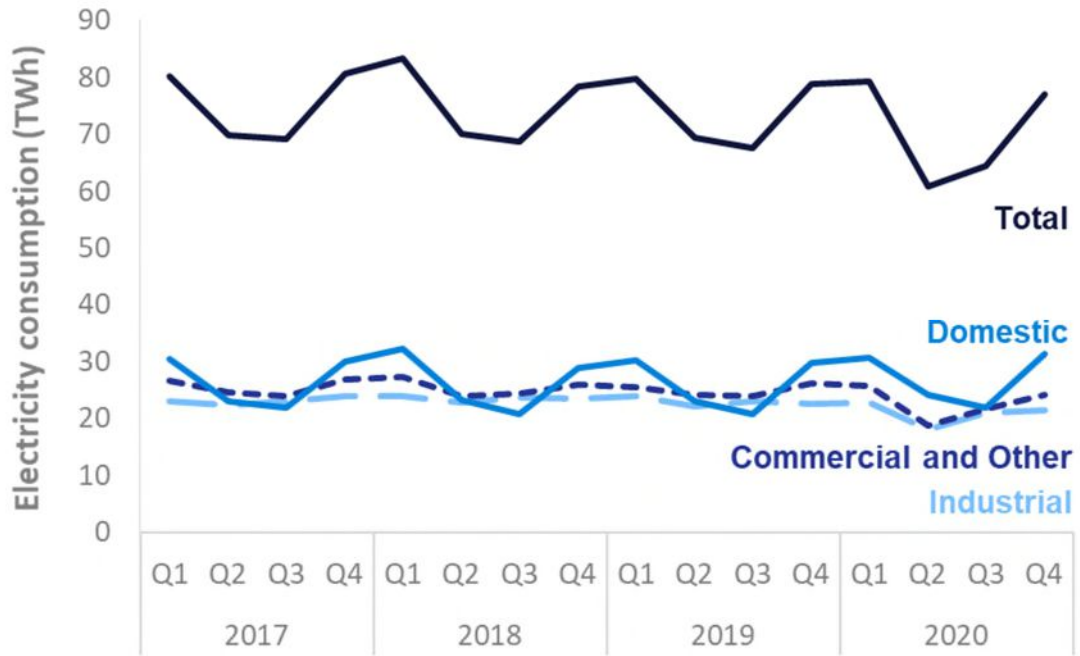
Total electricity generated in 2020 was 313 TWh, 3.7 per cent less than in 2019, reflecting the lower demand for electricity during 2020. Generation from renewable sources increased year on year and in 2020 exceeded the generation from fossil fuels for the first time in the published data series. Renewable sources generated 134 TWh in 2020, an increase of 11 per cent. In contrast, 2020 saw generation from nuclear (50 TWh) and fossil fuels (121 TWh) at the lowest values on the published data series.

Quarter 4 of 2020 saw lower electricity demand and generation than Quarter 4 2019. Demand was down by 2.1 per cent while total generation decreased by 2.6 per cent. Electricity consumed by the industrial sector fell by 4.8 per cent while consumption by other final users decreased by 8.9 per cent. This reflects the ongoing Covid-19 restriction on business and industry. Domestic electricity consumption increased by 5.3 per cent as people continued to spend more time at home, including increased working from home.

Renewable electricity generation was 34.4 TWh in Quarter 4 2020, an increase of 4.5 per cent compared to the same period in 2019. Nuclear generation fell by 8.0 per cent in Quarter 4 2020 to 14.4 TWh as outages continued at many of the UK's nuclear plants. Generation from fossil fuel totalled 34.2 TWh, slightly lower than the generation from renewables and a decrease of 6.3 per cent compared to Quarter 4 2019.

Final consumption of electricity was 284.4 TWh in 2020, a decrease of 4.7 per cent compared to 2019. This was driven by a substantial reduction in non-domestic electricity consumption due to restrictions introduced as a result of the Covid-19 pandemic.

Chart 5.1 Electricity consumption by sector

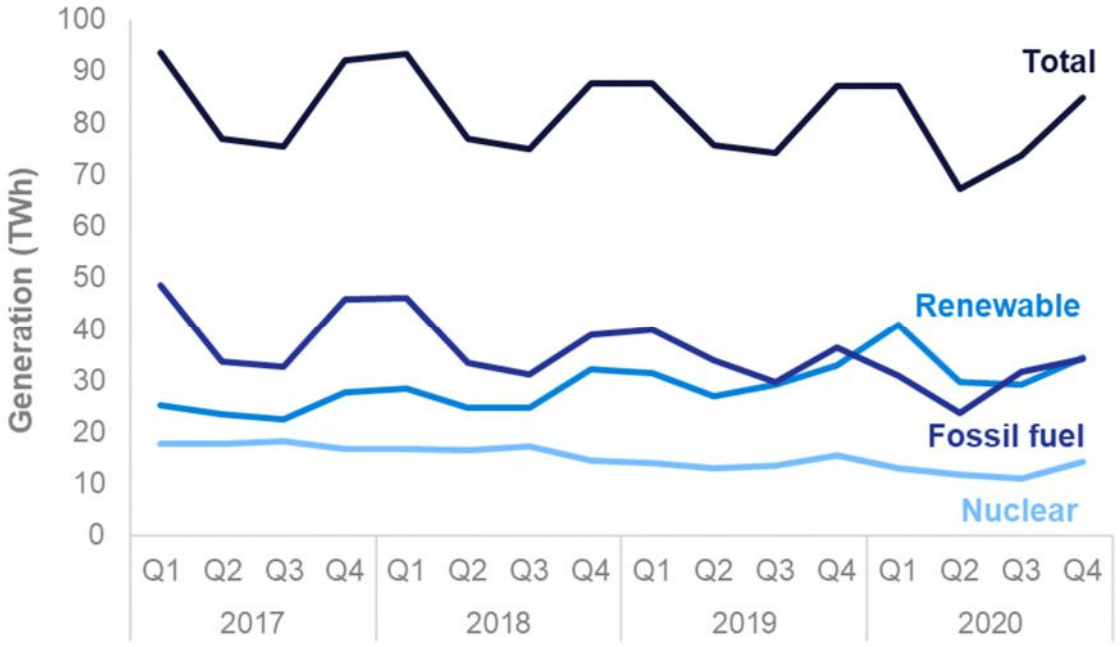


Industrial use of electricity, including iron and steel, was down 9.0 per cent in 2020 compared to 2019, and consumption by other final users, including commercial use, decreased by 10.4 per cent. Conversely, domestic consumption increased by 4.0 per cent, reflecting the increase in time spent at home.

Consumption was lower in each quarter of 2020 than the same quarter in 2019. The largest decrease was in Quarter 2, where it was down 12.3 per cent compared to Quarter 2 2019 as the first national lockdown took effect. The Covid-19 restrictions have also changed seasonal trends in domestic consumption. In 2019 and in earlier years, domestic consumption was higher than non-domestic in Quarter 1 and Quarter 4 of the year and lower in Quarters 2 and 3. For 2020, all four quarters of the year had domestic consumption similar to or higher than levels of industrial and other non-domestic consumption.

Quarter 4 of 2020 saw overall consumption levels that were more like Quarter 4 of 2019, despite a second national lockdown in November. Final electricity consumption was down by 2.2 per cent in Quarter 4 of 2020, in comparison with the same period in 2019, again linked to lower non-domestic consumption as the activities of business and industry were restricted. Though the overall consumption was similar, the splits by sector show differences in how each was affected. Electricity consumed by the industrial sector fell by 4.8 per cent compared to Quarter 4 2019, broadly mirroring the contraction shown in the manufacturing Index of Production. Consumption by other final users (including the commercial sector) decreased by 8.9 per cent. The decreases in non-domestic consumption were offset by an increase in domestic electricity consumption of 5.3 per cent. This reflected people continuing to spend more time at home and was seen despite higher average temperatures which would usually reduce domestic electricity demand for heating.

Chart 5.2 Electricity generated, by fuel



Total electricity generated in 2020 was 312.8 TWh, 3.7 per cent less than in 2019 (324.8 TWh). This reflects lower demand for electricity during 2020 due to the Covid-19 restrictions. There was also a change in the sources of electricity, with a 5.2 per cent decrease in generation by Major Power Producers (MPPs) to 255.2 TWh, partly offset by a 3.6 per cent increase in generation from other generators to 57.6 TWh. Net imports also fell to 17.9 TWh, down by 15 per cent compared to 2019.

Generation from renewable sources has been increasing year on year and in 2020 exceeded the generation from fossil fuels for the first time in the published data series. Renewable sources generated 134.3 TWh in 2020, an increase of 11 per cent. In contrast, generation from fossil fuels was down 14 per cent to 120.5 TWh. This was also shown in the shares of generation, with the share coming from renewables rising sharply to 42.9 per cent, compared to the 38.5 per cent generated from fossil fuels (38.5 per cent). As chart 5.2 shows,

renewable generation exceeded fossil fuel generation in Quarters 1, 2 and 4 of 2020 and was only slightly lower in Quarter 3.

The increase in renewable generation in 2020 was driven by high levels of generation from wind, which increased by 18 per cent compared to 2019. This was supported by favourable conditions for generation and increased capacity, particularly for offshore wind, which generated 26 per cent more electricity in 2020 than in 2019. Shares of generation increased for all renewable technologies with wind generation accounting for almost a quarter of 2020's total at 24.2 per cent, an increase of 4.4 percentage points (pp).

Generation from nuclear was 50.3 TWh in 2020, the lowest on the published data series and a decrease of 11 per cent compared to 2019. This was due to a series of statutory and unplanned outages at the UK's nuclear plants over the year. Despite the lower nuclear generation, the share of generation from low carbon sources increased again in 2020 to 59.0 per cent, up 4.6 pp compared to 2019, due to high generation from renewables.

Fossil fuel generation in 2020 was the lowest value on the published data series at 120.5 TWh, 38.5 per cent of electricity generated. While fossil fuel generation has been decreasing year on year since 2010, the lower demand in 2020 reduced the use of coal and gas generators even further. The fall in the use of fossil fuels has largely been driven by a significant reduction in coal generation, which has fallen from a fifth of generation in 2015 to just 1.7 per cent in 2020. Just four coal plants are currently operational in the UK, with these expected to be closed by October 2024. Gas generation also fell in 2020, down 13 per cent compared to 2019 to 114.1 TWh. Gas continues to be the dominant fuel in the UK generation mix, generating 36.5 per cent of the total in 2020, although this was down 4.1 pp compared to 2019.

Quarter 4 of 2020 saw total electricity generation of 84.9 TWh, which was a 2.6 per cent decrease compared to Quarter 4 2019. This was in line with the 2.1 per cent decrease in demand over the same period. Though generation was lower than in the same period of 2019, it was closer to normal seasonal levels of generation than the lower levels seen in previous quarters of 2020 because of the UK's COVID-19 restrictions.

Renewable electricity generation was 34.4 TWh in Quarter 4 2020, representing 40.5 per cent of total electricity generation, supported by increased capacity and favourable conditions for renewable generators. This was the third quarter in 2020 in which the renewable generation exceeded the generation from fossil fuel, though the difference was smaller than in Quarters 1 and 2 of 2020. The high renewable generation was particularly driven by high generation from offshore wind, which generated 12.0 TWh in Quarter 4 2020, a 16 per cent increase on the previous year and in line with increased offshore capacity. In contrast, solar generation fell by 8.1 per cent in Quarter 4 2020, despite increased capacity, as solar generators were restricted by lower average daily sun hours than in Quarter 4 2019.

Nuclear generation fell by 8.0 per cent in Quarter 4 2020 compared to the previous year with 14.4 TWh generated by nuclear power. During this time, maintenance outages continued at Hartlepool, Heynsham 1, Hunterston B and Dungeness B, and finished at Hinkley Point B and Sizewell B. Despite relatively low nuclear generation, low carbon sources generated 57.4 per cent of the total in Quarter 4 2020, up 1.8 percentage points on the previous year, supported by high renewables generation.

Generation from fossil fuels was 34.1 TWh in Quarter 4 2020, which was down 6.3 per cent compared to Quarter 4 2019. This represented 40.3 per cent of total generation, a 1.6 pp decrease on the previous year. Gas remained the fuel with the highest generation at 32.6 TWh, although this was a decrease of 3.0 per cent compared to Quarter 4 of 2019. Coal generation remained low at just 1.3 TWh, 1.5 per cent of UK generation, half of the share of generation in Quarter 4 2019 and a new record low.

Section 6: Renewables

Key headlines

In 2020, renewable generation increased by 11 per cent (13.8 TWh) to a record 134.3 TWh, outstripping generation from fossil fuels for the first time. Offshore wind generation accounted for most of the increase with high wind speeds and some added capacity. Overall, renewables accounted for 42.9 per cent of total generation another new record.

Renewable capacity growth began to slow in mid-2019 and this continued during 2020, with less than 1 GW (2.0 per cent) added during the year, the lowest percentage increase seen since 2010 (see chart 6.2).

In the last quarter, renewable electricity generation was 34.4 TWh in 2020 Q4, 1.5 TWh (4.5 per cent) more than 2019 Q4 with almost half the increase being in offshore wind, due to added capacity and higher wind speeds. Generation for some technologies fell; plant biomass (by 4.5 per cent), Solar PV (8.1 per cent), and landfill gas (5.2 per cent).

Renewables' share of total generation was 40.5 per cent in 2020 Q4, higher than in quarters two and three but below the record achieved in Q1 (47.1 per cent), when wind generation was unusually high with the effects of storms Ciara and Dennis.

Chart 6.1 Change in renewable generation and capacity between Q4 2019 and Q4 2020

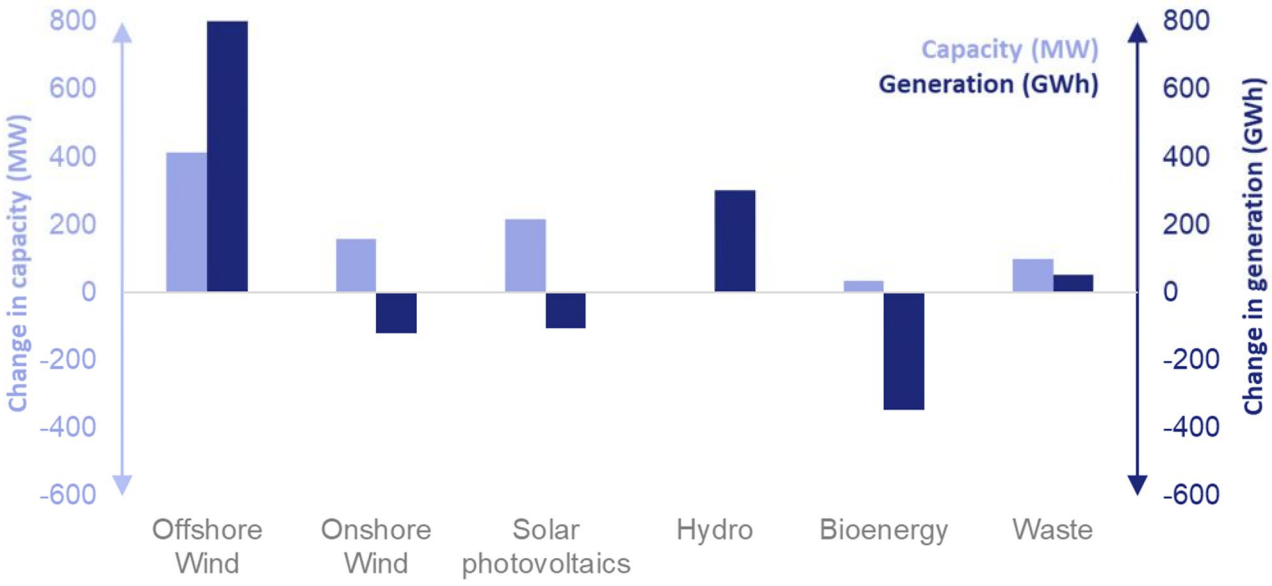
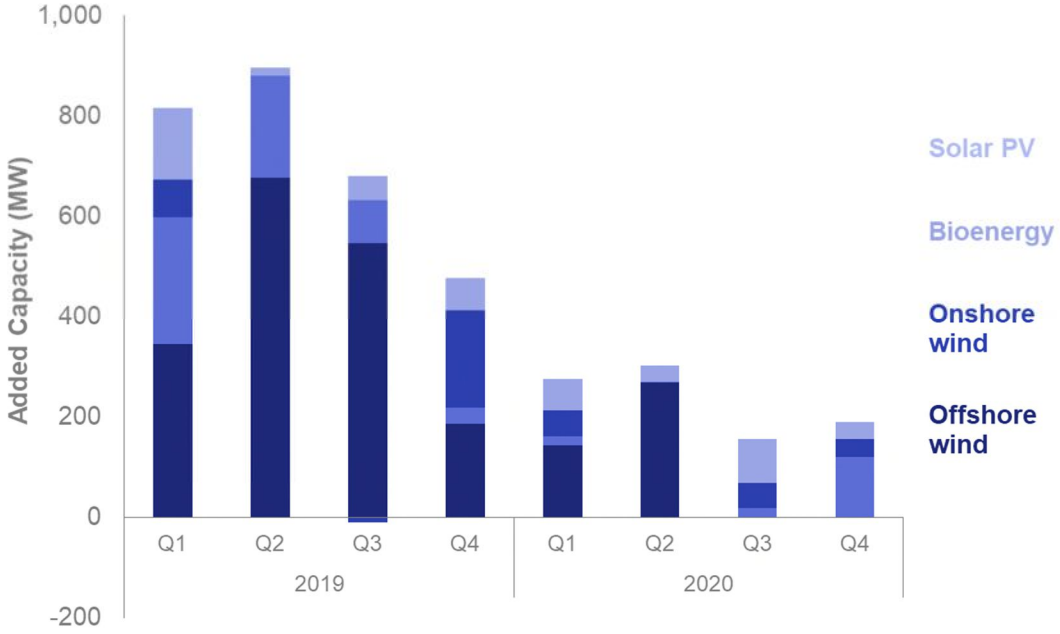


Chart 6.1 shows increases in capacity by technology compared to changes in generation since 2019 Q4; where capacity and generation trends conflict, it tends to indicate the dominance of weather conditions. Offshore wind generation increased by 16 per cent in response to both higher wind speeds and added capacity (0.4 GW, the largest new site being East Anglia 1). Onshore wind also saw added capacity (0.2 GW) but generation fell by 1.3 per cent, despite the higher wind speeds. Wind speeds vary across the UK and with 80 per cent of wind generation being in Scotland, this can dominate UK generation. Generation was also affected by several wind farms having to curtail their generation at times when supply exceeded demand.

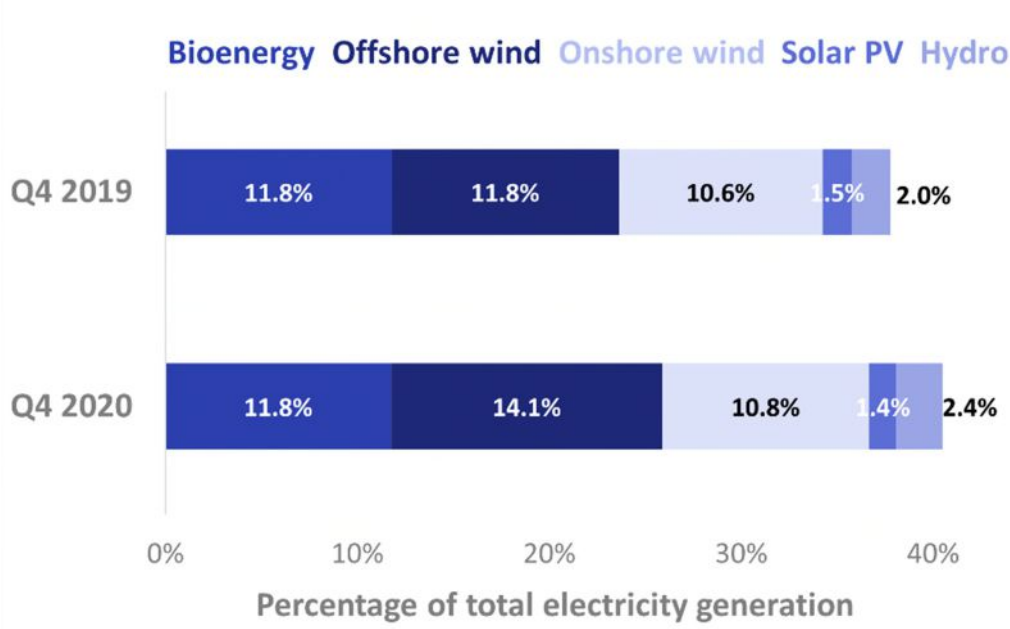
Solar PV generation fell by 8.1 per cent with shorter sunlight hours more than offsetting a modest 1.6 per cent increase in capacity[2]. Hydro generation increased 17 per cent, because of higher average rainfall[3].

Chart 6.2 Added capacity in 2019 and 2020 for the leading technologies



In total, renewable capacity grew by just 2.0 per cent during 2020, the lowest growth rate since at least 2010, compared with an average growth of almost 20 per cent during the preceding ten years. Some quarters saw no added capacity for certain technologies; in Q2, there was no increase for onshore wind and bioenergy and in quarters three and four there was no new offshore wind capacity, which had previously seen large increases. Although growth in onshore wind capacity had already fallen towards the end of 2019, it was still higher than in 2020 (574 MW added in 2019, compared with just 157 MW in 2020). New Solar PV capacity also slowed in 2020, though to a lesser extent, with 217 MW being added in 2020 compared with 273 MW in 2019. Although uncertain, Covid-19 restrictions may have caused delays in some projects.

Chart 6.3 Renewables' share of electricity generation – Q4 2019 and 2020



[2] The Feed in Tariff (FiT) scheme[2] closed March 2019. BEIS continues to monitor small scale generation using the Central FiTs Register, and Micro Generation Certification Scheme (MCS) registrations and the Renewable Energy Planning Database (REPD). Currently excluded are unsubsidised installations below 1MW not MCS registered. We are reviewing data sources to improve coverage.

[3] See technical information page for links to weather data.

In 2020 Q4, renewable's share of generation was 40.5 per cent, 2.7 percentage points higher than in the same quarter in 2019, due to a combination of increasing renewable generation and a decrease in total electricity generation. The share of generation from offshore wind generation's increased from 11.8 per cent in 2019 Q4 to 14.1 per cent in 2020 Q4 whilst solar PV's share fell from 1.5 per cent to 1.4 per cent. The share of generation from bioenergy remains stable at 11.8 per cent.

In 2020, electricity generated from renewable sources was 134.3 TWh, 13.8 TWh (11.4 per cent) more than in 2019. Over 80 per cent of this increase can be accounted for by wind generation; with a modest increase in total wind capacity of just 2.4 per cent, the dominant driver was the exceptionally strong wind speeds experienced during storms Dennis and Ciara in the first quarter. Offshore wind in particular saw the highest growth rate of the technologies with generation up 27 per cent (8.5 TWh) with onshore increasing by 8.6 per cent (2.8 TWh). In 2020, for the first time, generation from offshore wind exceed that of onshore wind on an annual basis. This first occurred in 2019 Q3 and it has remained higher since. It is also the first year offshore wind's share of renewable generation has exceeded onshore, and now represents the highest share of all the technologies at 30.3 per cent with onshore representing a 26.0 per cent share.

Although bioenergy's share of renewable generation remained high at 29.3 per cent, it remains well below its share in 2009 at 42.4 per cent. Much of this decline is due to other technologies such as wind and solar's increasing penetration, the latter being in response to the Feed in Tariff. Between 2019 and 2020, bioenergy generation increased by 2.1 TWh (5.6 per cent) with most of the increase being in plant biomass. With just 9 MW of capacity added during the year (a modest 0.2 per cent increase) and no weather effects relevant to generation, most of the increase is due to lower than expected generation in 2019 as there were several plant outages.

A 100 MW capacity increase in municipal solid waste boosted generation by 0.5 TWh, a 13 per cent growth rate and anaerobic digestion also increased its capacity though to a lesser extent (27 MW, or 5.0 per cent). Both technologies saw records being achieved in 2020 alongside offshore and onshore wind, sewage sludge digestion, and plant biomass.

Hydro capacity increased marginally with just 4 MW being added, an increase of 0.8 per cent. Generation was higher in 2020 (by 9.2 per cent) mostly due to higher levels of rainfall in 2020 when compared to 2019.

Some technologies saw generation decreases in 2020 most notably landfill gas which is continuing to see falls in rates of extraction (and hence efficiencies). Generation fell by 147 GWh (4.0 per cent). Solar PV generation also decreased slightly (by just 0.9 per cent to 12.8 TWh) despite higher average sunlight hours in 2020 compared to 2019, and some additional capacity (217 MW).

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Data tables and special articles

Data in this release

Data are collected by BEIS through surveys of energy suppliers. This publication highlights key stories in energy in the UK for the specified period. Additional data are available in the quarterly and monthly statistical tables for each fuel and total energy. The tables are generally in commodity balance format, showing the flow from the sources of supply through to final use.

Special articles

Special articles that explore current topics of interest are available alongside this summary report. Included in this publication are:

Supply of Liquefied Natural Gas in the UK in 2020

Capacity of UK electricity generation assets in the 21st century, 2000 to 2019

Domestic wood consumption revised baseline

Upcoming developments in dissemination of Energy Trends and the Digest of UK Energy Statistics

Statistical tables*

Data tables available as part of the Energy Trends series:

Total energy
Solid fuels and derived gases
Oil and oil products
Gas
Electricity
Renewables

The full range of special articles is available here: https://www.gov.uk/government/collections/energy-trends-article

Additional sources of information

Index of Production, published by the Office for National Statistics:
https://www.ons.gov.uk/economy/economicoutputandproductivity/output/bulletins/indexofproduction/previousReleases

Index of Services, published by the Office for National Statistics:
https://www.ons.gov.uk/economy/economicoutputandproductivity/output/bulletins/indexofservices/previousReleases

Detailed annual Digest of UK Energy Statistics published on 30 July 2020:
http://www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes

Tables showing foreign trade flows of energy:
https://www.gov.uk/government/statistics/dukes-foreign-trade-statistics

Weather tables produced by BEIS using Met Office data:
https://www.gov.uk/government/collections/weather-statistics

Information on Energy Prices:
http://www.gov.uk/government/collections/quarterly-energy-prices

*Hyperlinks will open the most recently published table. If you require a previously published version of a table published by BEIS, please contact Kevin Harris:

Tel: 0300 068 5041
e-mail: kevin.harris@beis.gov.uk

Technical information

Methodology and revisions

More detailed notes on the methodology used to compile the figures and data sources are available on the collection pages for each fuel. The figures have not been adjusted for temperature or seasonal factors except where noted.

Percentage changes relate to the corresponding period a year ago. They are calculated from unrounded figures. They are shown as (+) or (-) when the percentage change is very large. Quarterly figures relate to calendar quarters. All figures relate to the United Kingdom unless otherwise indicated. Further information on Oil and Gas is available from the Oil & Gas Authority at www.ogauthority.co.uk/

Table of conversion factors

To	ktoe	TJ	GWh	million therms	To	toe	GJ	kWh	therms
From	Multiply by				**From**	Multiply by			
ktoe	1	41.868	11.63	.39683	**toe**	1	41.868	11.63	396.83
TJ	.023885	1	.27778	.0094778	**GJ**	.023855	1	277.78	9.4778
GWh	.085985	3.6	1	.034121	**kWh**	.000085985	.003600	1	.034121
million therms	2.52	105.51	29.307	1	**therms**	.00252	.105510	29.307	1

toe = tonne of oil equivalent
ktoe = thousand tonne of oil equivalent

Sector breakdowns

Categories for final users are defined by Standard Industrial Classification 2007:

Fuel producers	05-07, 09, 19, 24.46, 35
Final consumers	
Iron and steel	24 (excluding 24.4, 24.53 and 24.54)
Other industry	08, 10-18, 20-23, 24.4 (excluding 24.46), 24.53, 24.54, 25-33, 36-39, 41-43
Transport	49-51
Other final users	
Agriculture	01-03
Commercial	45-47, 52-53, 55-56, 58-66, 68-75, 77-82
Public administration	84-88
Other services	90-99
Domestic	Not covered

Revisions policy

Figures for the latest periods are provisional and are liable to subsequent revision. The BEIS statistical revisions policy sets out the revisions policy for these statistics, which has been developed in accordance with the UK Statistics Authority Code of Practice for Statistics.

Related publications

Recent publications of interest

Smart Meters quarterly statistics
Estimates on the roll-out of Smart Meters in Great Britain, covering meters operating and meters installed: www.gov.uk/government/collections/smart-meters-statistics

Household Energy Efficiency
Statistics on the Energy Company Obligation (ECO), Green Deal and homes insulated. Monthly updates of ECO measures and quarterly updates of in-depth ECO statistics, carbon savings and the Green Deal schemes: www.gov.uk/government/collections/household-energy-efficiency-national-statistics

Renewable Heat Incentive statistics
Statistics on deployment data for the domestic and non-domestic Renewable Heat Incentive (RHI) to support the uptake of renewable heat: www.gov.uk/government/collections/renewable-heat-incentive-statistics

Energy Consumption in the United Kingdom (ECUK)
Detailed data on end use estimates of energy in the UK: www.gov.uk/government/collections/energy-consumption-in-the-uk

Sub-national total final energy consumption
Findings of the sub–national energy consumption analysis in the UK for all fuels, for the period covering 1 January to 31 December, with gas consumption covering the annual period from mid-May: www.gov.uk/government/collections/total-final-energy-consumption-at-sub-national-level

Sub-national electricity consumption
Electricity consumption by consuming sector for Great Britain and devolved administration areas. Data are based on the aggregation of Meter Point Administration Number readings as part of BEIS's annual meter point electricity data exercise: www.gov.uk/government/collections/sub-national-electricity-consumption-data.

Sub-national gas consumption
Gas consumption by consuming sector for Great Britain, and devolved administration areas. Data are based on the aggregation of Meter Point Reference Number readings throughout Great Britain as part of BEIS's annual meter point gas data exercise. Data are subject to a weather correction factor to enable comparison of gas use over time: www.gov.uk/government/collections/sub-national-gas-consumption-data.

Sub-national road transport consumption
Road transport fuels consumption in the UK at regional and local authority level. Data is modelled and provided to BEIS by Ricardo Energy & Environment, with estimates based on where the fuel is consumed, rather than where it is purchased.
www.gov.uk/government/collections/road-transport-consumption-at-regional-and-local-level

Sub-national consumption of residual fuels
Non-gas, non-electricity and non-road transport fuels consumption in the UK. Includes coal, petroleum, solid fuels, and bioenergy not for generation or road use: www.gov.uk/government/collections/sub-national-consumption-of-other-fuels

Further information

National statistics

This is a National Statistics publication. National Statistics status means that our statistics meet the highest standards of trustworthiness, quality, and public value, and it is our responsibility to maintain compliance with these standards.

The Office for Statistics Regulation confirmed continued designation of Energy Trends as National Statistics in 2018 following a compliance check. A full assessment against the Code of Practice was last conducted in June 2014.

Pre-release

Some ministers and officials receive access to these statistics up to 24 hours before release. Details of the arrangements for doing this and a list of the ministers and officials that receive pre-release access to these statistics can be found in the BEIS statement of compliance with the Pre-Release Access to Official Statistics Order 2008.

User engagement

Users are encouraged to provide comments and feedback on how these statistics are used and how well they meet user needs. Comments on any issues relating to this statistical release are welcomed.

This publication is available from: https://www.gov.uk/government/collections/energy-trends

If you need a version of this document in a more accessible format, please email energy.statistics@beis.gov.uk

Please tell us what format you need. It will help us if you say what assistive technology you use.

Supply of Liquefied Natural Gas in the UK in 2020

Key headlines

This article provides an analysis of UK trends in trade of Liquefied Natural Gas (LNG) within the context of global markets. This is one of the fastest growing commodity markets globally. In 2020 the US grew to be the third largest global exporter of LNG, after Qatar and Australia, as it continued to expand capacity.

The UK is the second largest European importer behind only Spain. European countries, including the UK, have played an important role in balancing LNG markets since 2019. Substantial imports to the UK were seen in 2020, and these were stable compared to 2019 when imports had doubled compared to the year before. However, month to month the picture was more variable with low prices contributing to high imports early in the year.

Nearly half of UK LNG imports in 2020 were from Qatar, with a further quarter from the US. Total LNG imports made up 22 per cent of gas supply to the UK in 2020, compared to 21 per cent in 2019.

Introduction

Traditionally, natural gas has been moved to markets via pipeline. Cooling natural gas to approximately -160°C changes its state from gas to liquid, producing Liquefied Natural Gas (LNG). The volume of LNG is around 600 times smaller than in its gaseous state, meaning it can be shipped easily. This provides an alternative means of transportation where pipeline infrastructure does not already exist or is not viable. Once at its destination, LNG is regasified and used in the same way as natural gas which has not been liquefied.

Global liquefaction capacity has increased consecutively for the last six years. One of the reasons for this is that easily accessible natural gas reserves are being depleted. LNG has provided an alternative to established pipeline infrastructure. As the UK has become more reliant on imports of natural gas, due to a decline in indigenous production, LNG imports have gained importance in ensuring that the UK supply portfolio remains secure and diverse.

The aim of this article is to provide analysis of LNG supply to the UK (1) within the context of global LNG markets (2).

(1) UK and Europe data was sourced from the International Energy Agency (IEA) and Energy Trends: https://www.gov.uk/government/statistics/gas-section-4-energy-trends

(2) Global data was sourced from the Independent Commodity Intelligence Services (ICIS)

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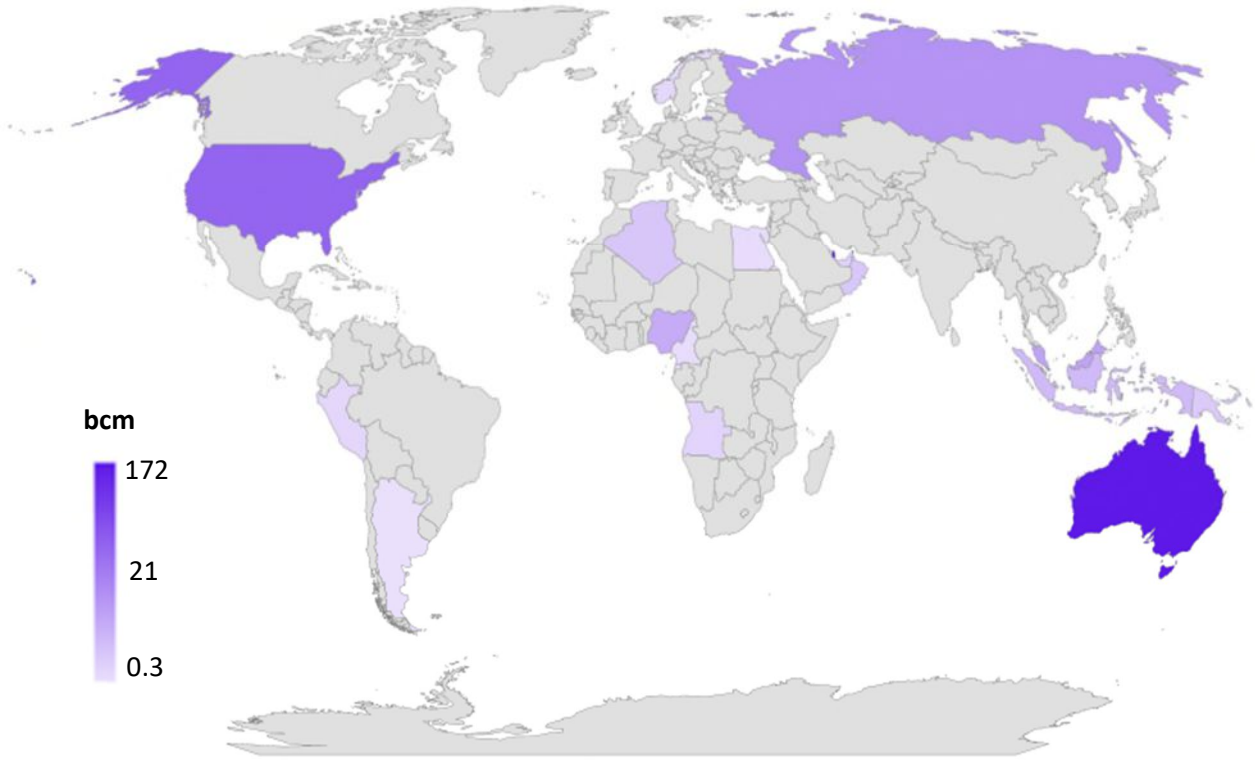
Global LNG Trade

Map 1: Global exporters of LNG by volume, 2020

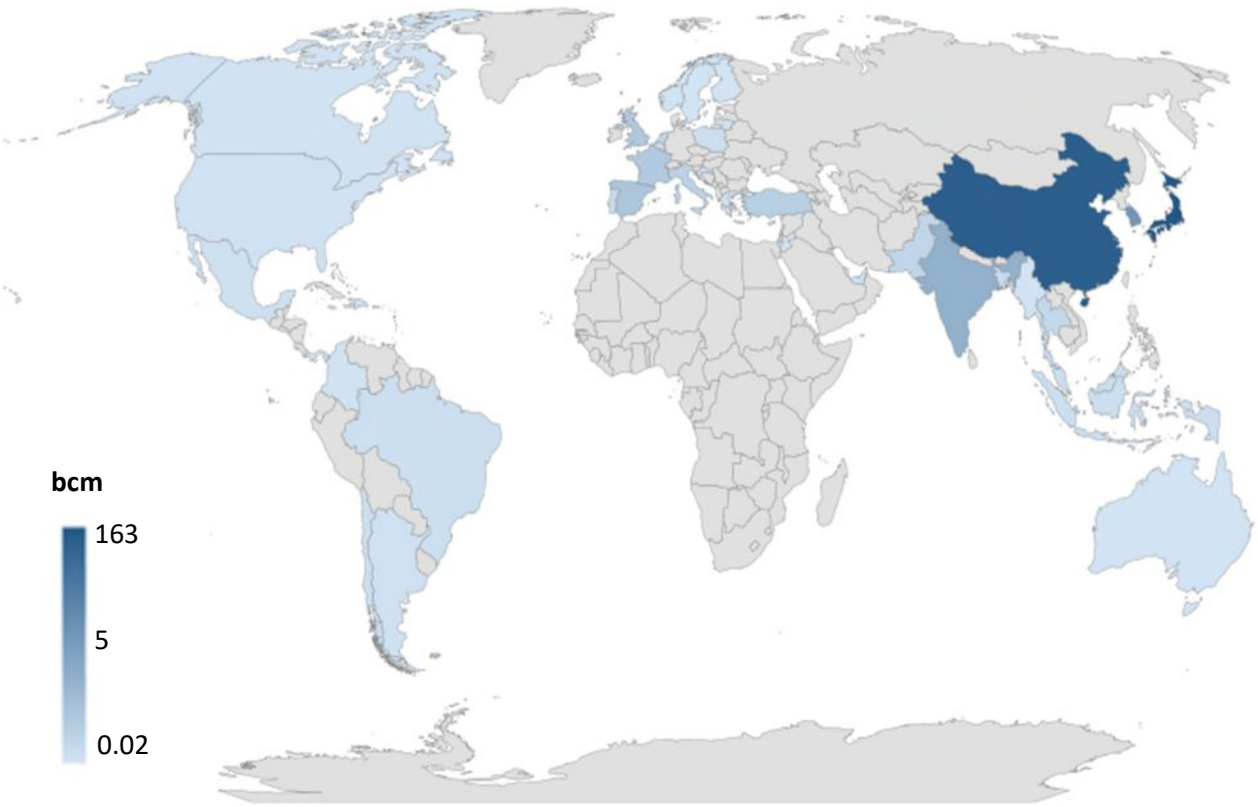


Map 1 shows global exporters of LNG. In 2020 Qatar and Australia were the largest exporters of LNG. The US moved to third largest, as it continues to expand capacity alongside the shale revolution. LNG liquefication capacity in the US increased by over 40 per cent in 2020 and export volumes were a third higher than in 2019. Other exporters of LNG tend to be those with large natural gas reserves including Russia, Malaysia, and Nigeria. Europe is not a major exporter of LNG; the largest European exporter of LNG is Norway. European exports of LNG accounted for just 16 per cent of global exports in 2020. The UK does not produce LNG but is able to re-export imported LNG – this is called a reload.

Whilst LNG can be traded flexibly outside of existing pipeline supply routes, factors such as shipping costs and boil-off (3) mean that proximity to the market plays some role in trade. A good example of this is Australia, which supplied 39 per cent of Japanese imports in 2020, whereas the UK has only ever received one cargo from Australia.

(3) The vapours created due to the ambient heat input while maintaining constant pressure in the cryogenic storage vessel, which must be either re-liquefied, used as fuel or burned off at a gasification unit.

Map 2: Global importers of LNG by volume, 2020



Asia remained the key global LNG market. The top five importers of LNG in 2020 were Japan, China, South Korea, India, and Taiwan. Japan exclusively imports natural gas as LNG, which it uses for power generation in place of ageing nuclear capacity; it along with South Korea and Taiwan have well established LNG markets. China and more recently India have seen substantial increases in LNG demand in recent years. In 2020, the Ministry of Ecology in China moved to replace coal with gas for heating in seven million households. Demand in India is sensitive to LNG price; imports increased by 15 per cent in 2020 compared to 2019, reaching all-time highs in February as spot prices plummeted. In addition, there are several emerging LNG markets in Asia including Pakistan, Thailand, Kuwait and Singapore who are looking to LNG for stable supply as their economies grow.

Chart 1: Top 10 Global importers of LNG by volume, 2020

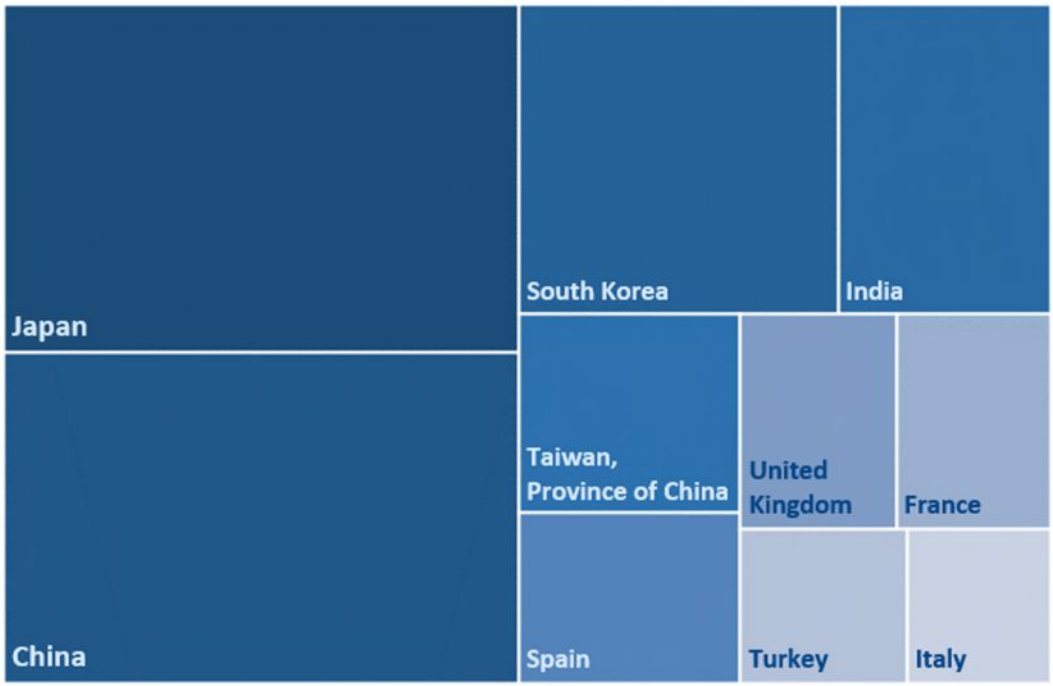
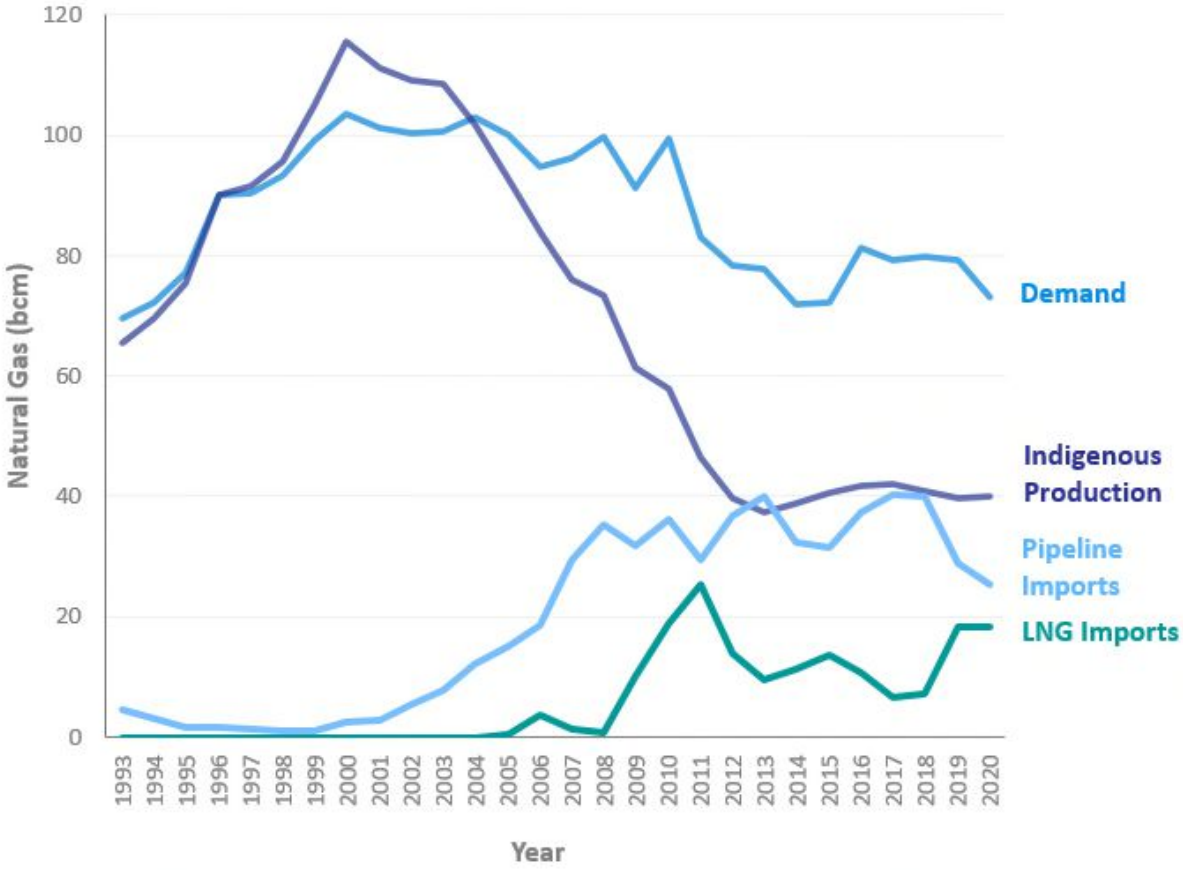


Chart 1 shows the top ten largest LNG importers globally. The UK is the second largest European importer of LNG behind Spain. Demand in Europe is substantially lower than in Asia. For context, in 2020 Turkey and the four largest European importers imported volumes equivalent to just over a quarter of that imported by the top five Asian importers.

However, Europe's substantial storage allows for imports when price is low, even during periods of low demand, meaning it can play a vital role in balancing the global LNG market; this was the case in 2019.

UK Gas Overview

Chart 2: Summary of UK Natural Gas Use, 1993 – 2020

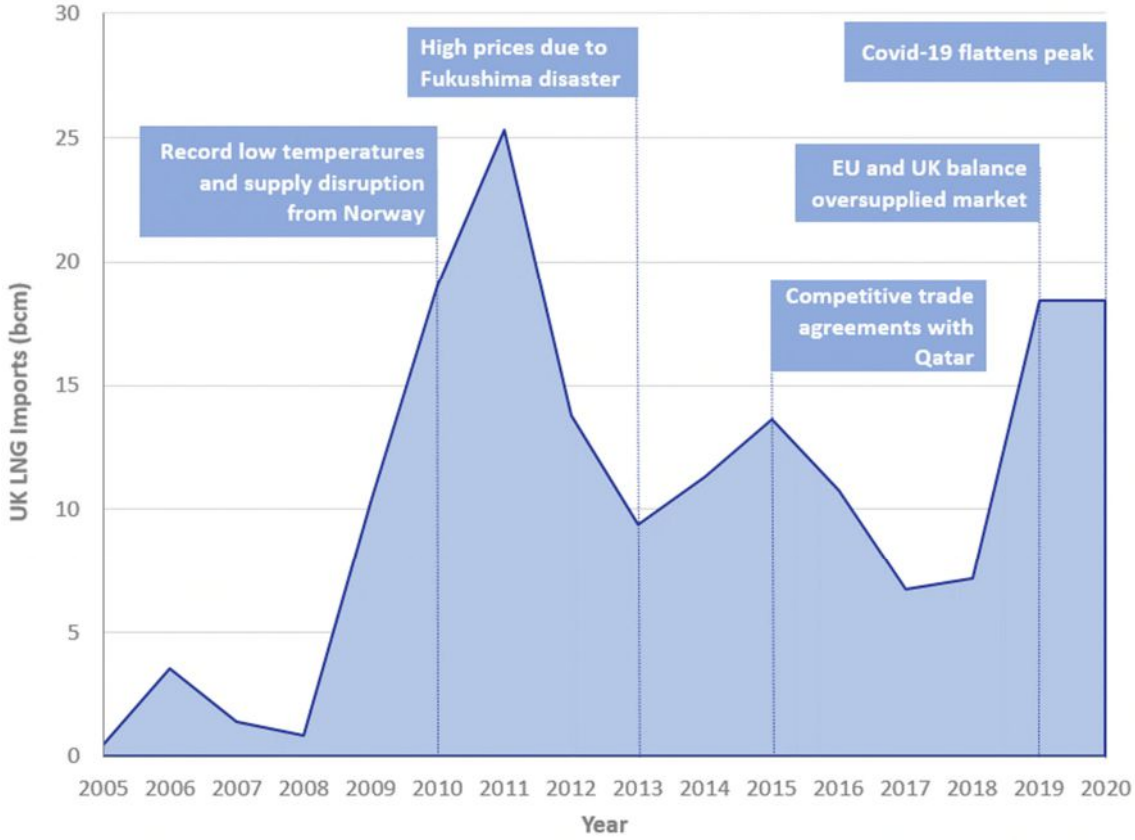


Indigenous production of natural gas from the UK Continental Shelf (UKCS) is transported via pipeline inland and to established trading partners. Chart 2 shows indigenous production exceeded demand between 1997 and 2003 when the UK was a net exporter of natural gas. Following this indigenous production declined before stabilising in 2013, at around a third of the 115 bcm peak in 2000. Since 2004 demand has also declined but at a slower rate than production. This meant that in 2020 indigenous production met just over half of demand. In 2020, UK demand for natural gas reduced by 7.7 per cent compared to 2019 as national restrictions were imposed to curb the Covid-19 pandemic.

As indigenous production declined, imports have increased to meet demand. The UK began importing LNG for commercial use in 2005. Imports of LNG were minimal until 2008 when they increased rapidly before peaking in 2011; since then, LNG imports have fluctuated. Historically natural gas imports by pipeline and of LNG have been negatively correlated meaning that as pipeline imports fall, imports of LNG increase, and vice versa. The UK continues to export some natural gas by pipeline; this tends to be seasonal. For example, exports to the Netherlands support a UK oversupply in summer months following the closure of storage facilities.

UK LNG Imports

Chart 3: UK LNG Imports, 2005 - 2020



2010-2011

Chart 3 shows that UK imports of LNG increased rapidly from 2008 peaking in 2011 at 25.3 billion cubic metres (bcm); accounting for 46 per cent of natural gas imports and 31 per cent of demand. This peak was the result of record low temperatures and disruption to pipeline supply due to industrial action in Norway. During the winter of 2010/11, on peak demand days, LNG was the second largest source of natural gas behind stock draws, making it more important than pipeline imports to meet demand.

2013

After the 2011 peak, LNG price increases saw a rapid decline in imports until 2013. These price increases were associated with the Tōhoku earthquake and tsunami in 2011 which caused the Fukushima disaster. In Asia, LNG was used as an emergency fuel to meet demand, as nuclear capacity was reduced over safety concerns. This led to the creation of an LNG spot market and subsequent changes to the global market structure.

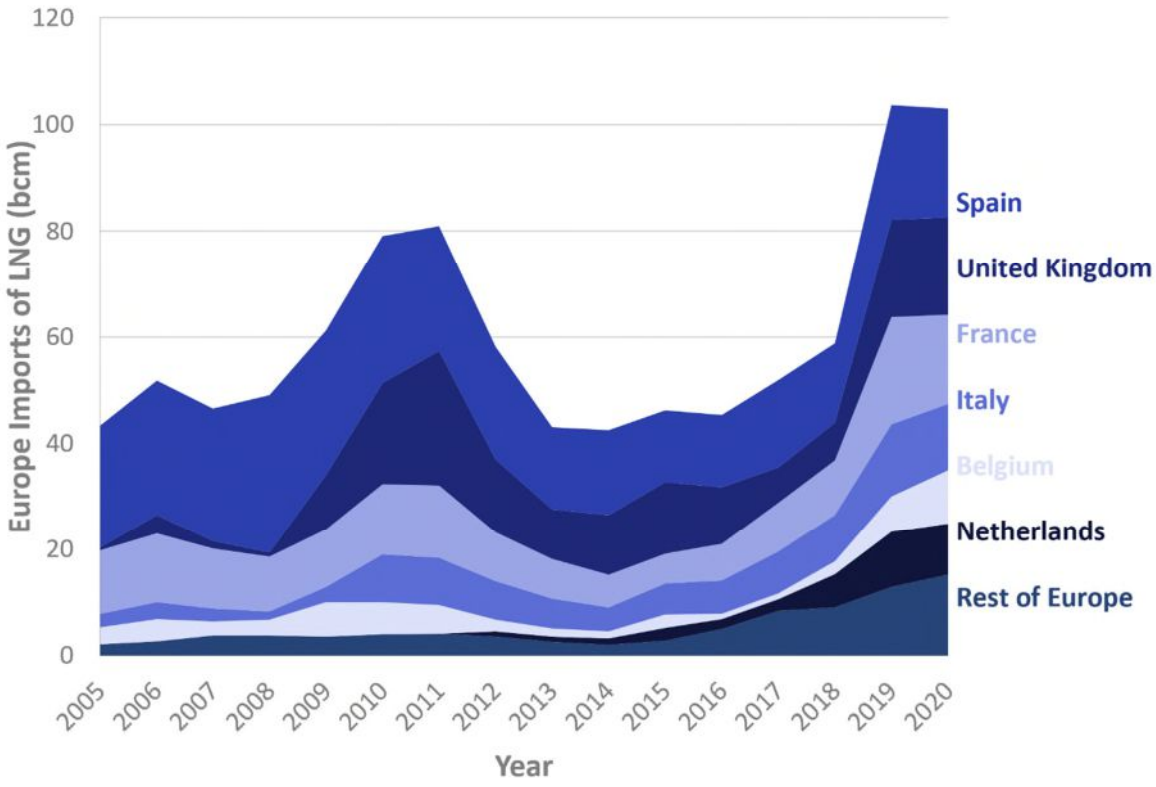
2014-2015

Following this, changes to UK LNG imports have been heavily influenced by markets. The 2014/15 bump in imports is linked to supply and purchase agreements (SPAs) with Qatar. These contractual agreements can be mutually beneficial, for example, Qatar Petroleum invested in UK LNG infrastructure including the South Hook LNG terminal, which in turn agreed to import Qatari LNG.

2019

In 2019, LNG imports peaked again at 18.5 bcm, just under three quarters of the peak in 2011. The UK played a key role in the European ‘LNG sink’, which saw steep increases in LNG imports across Europe to balance global LNG (Chart 4). This boom in imports was the result of an oversupplied market. Warm weather in Asia reduced demand whilst new projects in Qatar, the US and Russia increased supply. LNG spot price reached record lows and Europe played the role of the balancing market.

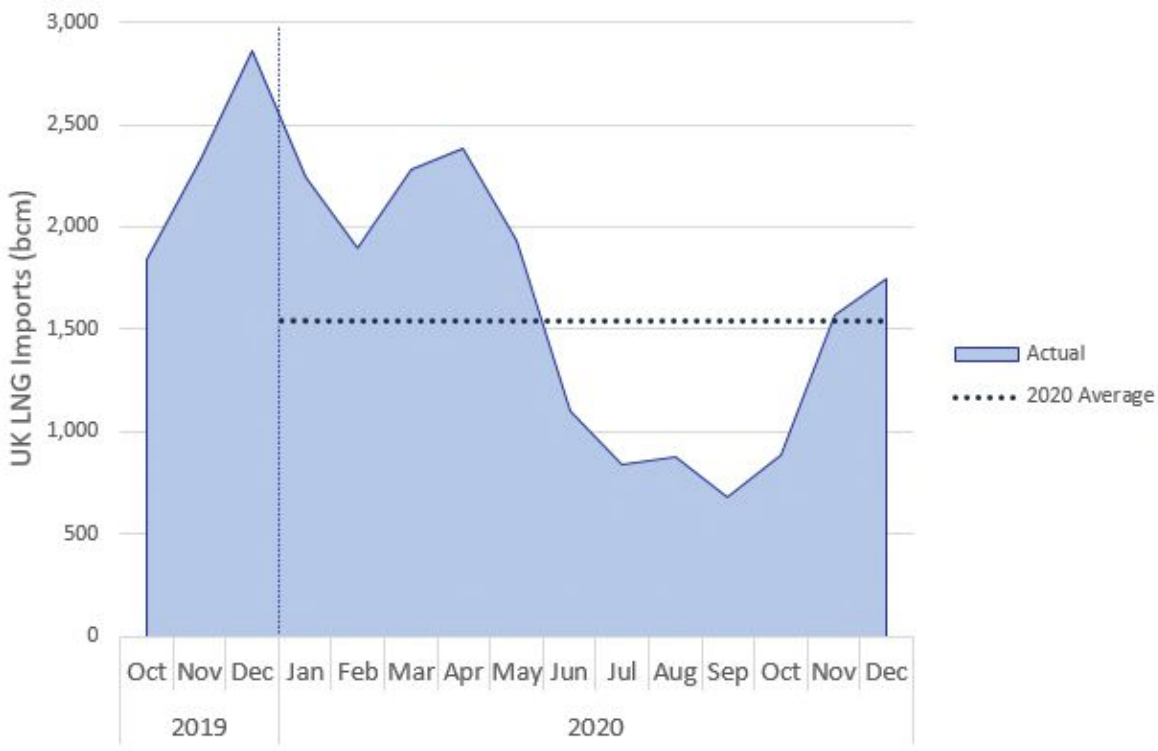
Chart 4: Europe LNG Imports, 2005 – 2020



2020

In 2020, the UK imported 18.4 bcm of LNG, accounting for 42 per cent of natural gas imports and 22 per cent of supply – maintaining the high levels seen in 2019. Chart 4 shows this trend was consistent for much of Europe. Chart 5 shows monthly imports unpacking hidden complexities within the 2020 figure.

Chart 5: UK LNG Monthly Imports, October 2019 - December 2020



In early 2020, Europe held high levels of gas in storage, due to stockpiling in late 2019 as a safety net during negotiations between Russia and Ukraine regarding a new transit deal. High storage levels combined with a mild winter saw a slump in imports from January.

Alongside this, in the first quarter of 2020 global lockdowns, to prevent the spread of Covid-19, began to reduce LNG demand, particularly in key Asian markets. This led to a decline in LNG prices which buyers in Europe took advantage of, sustaining high levels of imports in the first half of the year.

However, unlike in 2019, European gas inventory started the year at record high levels. In addition, restrictions to curb the Covid-19 pandemic continued into the summer exacerbating lower seasonal demand. This combination meant that maintaining high LNG imports was not sustainable and as such they began to fall over the summer.

Moving into winter, UK imports increased as temperature declined; meanwhile a cold Asian winter increased LNG demand, which combined with unanticipated supply outages led to the highest LNG spot price ever recorded, in January 2021.

UK LNG Import Sources

Chart 6: Top 6 2020 Import Sources as a percentage of total LNG imports, 2005 - 2020

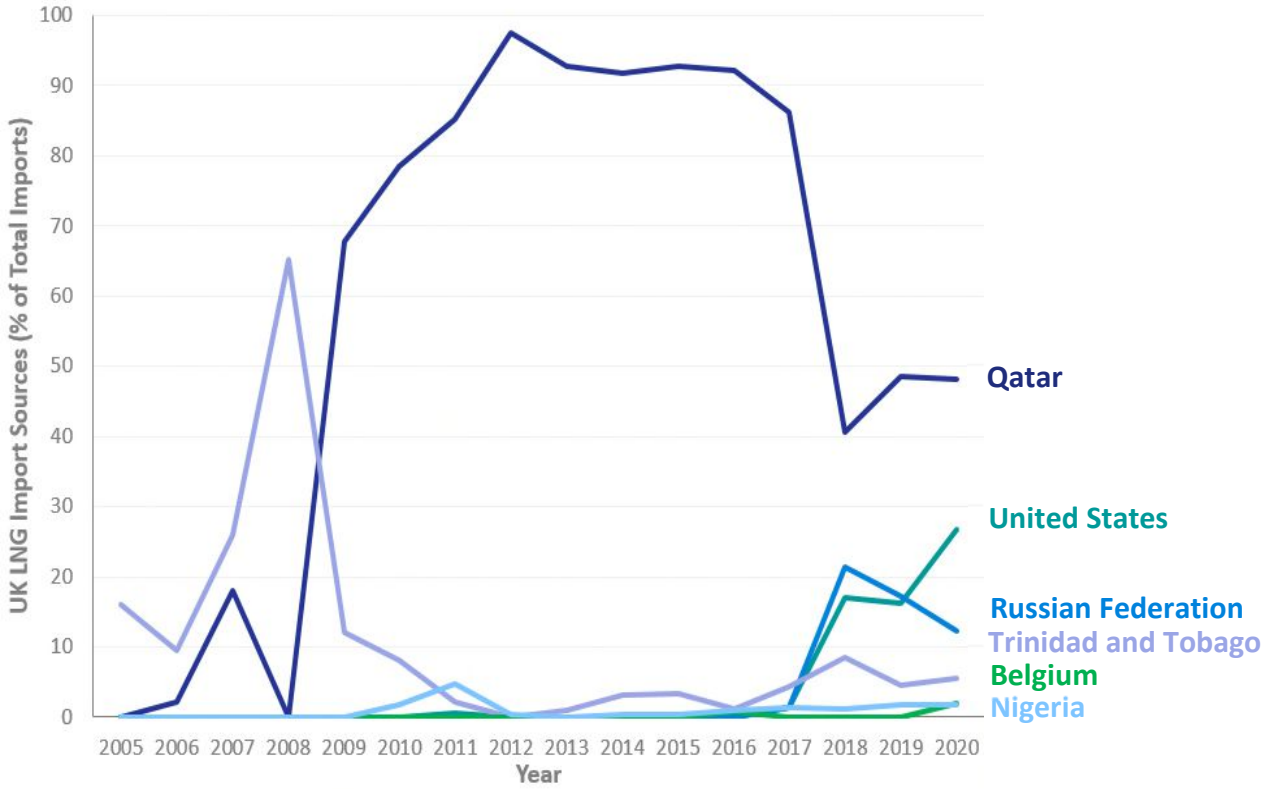


Chart 6 shows the top six sources of UK LNG imports as a percentage of total imports. A strong trading relationship with Qatar means that it remains the dominant source in 2020. However, the share of Qatari LNG has declined in recent years falling from 98 per cent in 2012 to just under half in 2020. This fall is in line with increases in global liquification capacity allowing for a diversification of import sources. For example, in 2005 the UK imported LNG from just two sources, Algeria and Trinidad and Tobago, this climbed to eight in 2011 and 10 in 2020. Notably, imports from the US increased by 64 per cent in 2020 compared to 2019. This was despite a complex year for US shale as several wells were forced to shut-in because of the Covid-19 pandemic, and as further environmental concerns were raised.

Summary

The UK uses natural gas from indigenous production and imports. Some of these imports arrive as LNG. The UK began importing LNG in 2005 with the peak in 2011 when LNG made up more than a quarter of total supply. Since 2011, import volumes have been related to economic factors. Asia is a major consumer of LNG hence Asian markets tend to influence European and UK imports.

UK LNG imports in 2020 were stable compared to 2019 when they substantially increased, as Europe balanced an oversupplied market. Moving into 2020, substantial levels of gas in European storage, followed by restrictions in response to the Covid-19 pandemic, muted potential growth for UK LNG imports. Total LNG imports made up 22 per cent of supply of gas to the UK in 2020 compared to 21 per cent in 2019, with Qatar as the primary source of supply followed by the US.

Major commentators are projecting continued growth of LNG markets despite setbacks in 2020 due to the Covid-19 pandemic, as established importers shift focus to reducing greenhouse gas emissions and as emerging economies seek secure energy supply.

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Capacity of UK electricity generation assets in the 21st century, 2000 to 2019

Key headlines:

- UK electricity generation capacity rose steadily over the last twenty years with total installed capacity above 100 GW since 2017, and up a third since the turn of the millennium.
- During this time, there was a dramatic shift in the capacity mix, particularly in the last decade. Fossil fuel fired capacity declined from its 71.0 GW peak in 2010, while renewable electricity generation capacity rose rapidly. In 2019, the capacity share of renewables exceeded that of fossil fuel fired plants for the first time, with renewable generators providing 47.1 GW, and fossil fuel generators providing 43.9 GW.
- Nuclear plant capacity declined gradually over the past twenty years, with no new capacity since Sizewell B was commissioned in 1995. The total capacity in 2019 was 9.2 GW, which was 26 per cent lower than 2000 levels, following the closure of the eight remaining Magnox reactors during this time.
- Fossil fuel fired capacity has been in decline since 2010, predominantly driven by the phasing out of coal plants since 2013, while gas generation capacity has remained relatively stable in this time. Coal generators, which dominated the capacity mix in the 20th century and provided over a third of capacity in 2000, provided only 6.8 per cent of capacity in 2019, with just four coal plants currently in active operation at the time of writing. Oil and dual fuelled stations have also largely fallen out of the capacity mix, providing a combined share of less than two per cent in 2019.
- Renewable installed capacity currently stands at just over 48 GW (according to provisional figures for 2020), which is just under half the UK total. This compares to 3.0 GW of renewable capacity in 2000 and is five times higher than the 2010 value of 9.3 GW. This expansion was supported by subsidy schemes including the Renewables Obligation (RO), Feed-in-Tariffs (FITs) and Contracts for Difference (CfD).
- The dominant renewable technology in terms of capacity is onshore wind, which provided 14.1 GW in 2019, compared to 13.3 GW of solar and 10.0 GW of offshore wind capacity. Bioenergy provided 7.8 GW in 2019, having risen sharply since 2013 following the conversion of coal units to biomass at Drax and Lynemouth.

Introduction

This article examines changes and trends in the capacity of UK electricity generation assets in the period 2000 to 2019. In particular, the article draws attention to dramatic changes to capacity by fuel and technology, which drove changes in the generation mix. The data in this article are taken from chapters 5 and 6 of the Digest of United Kingdom Energy Statistics (DUKES) 2020; the definitions are thus identical to those in DUKES. Note that fossil fuel-fired capacity totals in this article include coal, oil, mixed and dual fuelled conventional steam stations, combined cycle gas turbine (CCGT) stations, gas turbines and oil engines and combined heat and power plants (electrical capacity only) as listed in DUKES table 5.7. Renewable electricity generation capacity includes hydroelectric (natural flow) stations, wind, solar, shoreline wave, tidal, bioenergy and waste as defined in DUKES table 6.4.

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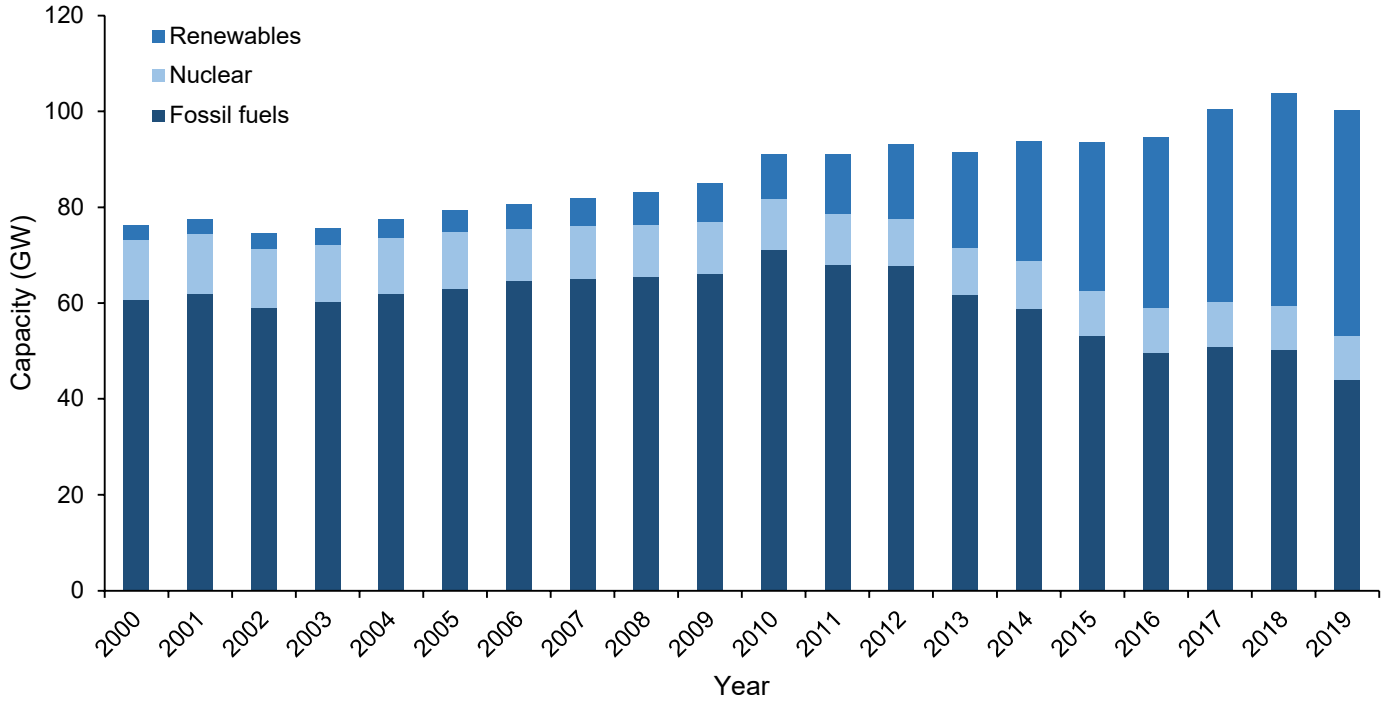
UK electricity generation capacity

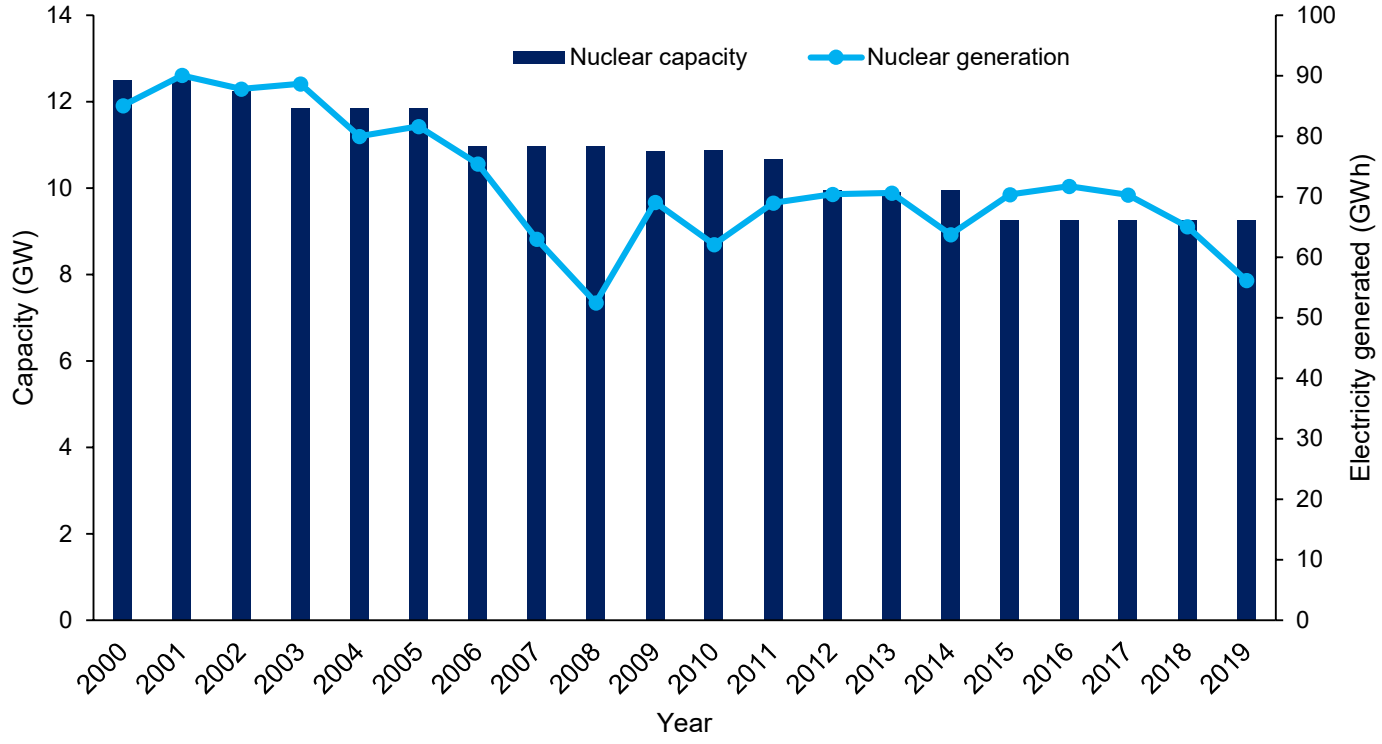
Since the beginning of the 21st century, total installed capacity of UK electricity generation assets has risen steadily, with a dramatic shift in the capacity mix resulting from the emergence of renewable technologies. Chart 1 presents electricity generation capacity in the UK by technology. In 2000, 80 per cent of installed capacity was from fossil fuel fired generators, a proportion which remained relatively stable until 2010, since when it has fallen year on year. The total capacity of all generators increased year on year from 2003 to 2012, primarily driven by the increasing capacity of gas generators, while renewable capacity only grew slowly over this time. Total fossil fuel capacity reached a peak of 71.0 GW in 2010, 17 per cent higher than in 2000, but has fallen steadily since. Renewable generators became significantly more abundant in the 2010s, particularly because of the rapid expansion of wind and solar generation assets. In 2010, the renewable capacity comprised one tenth of the total for the first time and the following year exceeded the share of capacity provided by nuclear. In the years following, renewable capacity rose sharply, increasing by a factor of five in the last decade. In 2019, renewable generators provided 47 GW of capacity which, at 47.0 per cent of total capacity, exceeded the share provided by fossil fuel generators for the first time.

Chart 1: Installed capacity of UK electricity generation assets by technology, 2000 to 2019.



Nuclear capacity has also fallen since 2000, but at a slower rate than fossil fuel capacity (see Chart 2). The last new nuclear power station, Sizewell B, was commissioned in 1995 at which time the nuclear capacity was 12.9 GW, about a fifth of the total UK capacity. In the years that have followed, all eight remaining Magnox reactors closed, including Wylfa in 2015, which was the last Welsh nuclear power station. There are currently 14 active Advanced Gas-cooled Reactors (AGRs) at seven plants and one Pressurised Water Reactor (PWR). Total nuclear capacity in 2019 was 9.2 GW, 26 per cent lower than 2000 levels. Apart from Sizewell B, the seven other active plants are scheduled to close by 2035, although 3.2 GW of this capacity will be offset by the commission of Hinkley Point C, which is currently under construction and expected to generate electricity for the first time in the mid-2020s. The UK's ageing nuclear power stations saw the decline of nuclear generation over the past two decades due to prolonged maintenance outages. This reduced operational nuclear capacity. In 2007 and 2008, nuclear generation fell sharply, which was particularly the result of maintenance at Hinkley Point B and Hunterston B which restricted operations. In 2019, nuclear generation was at the lowest value since 2008 due to long-term maintenance outages.

Chart 2: Nuclear electricity generation and capacity in the UK, 2000 to 2019.

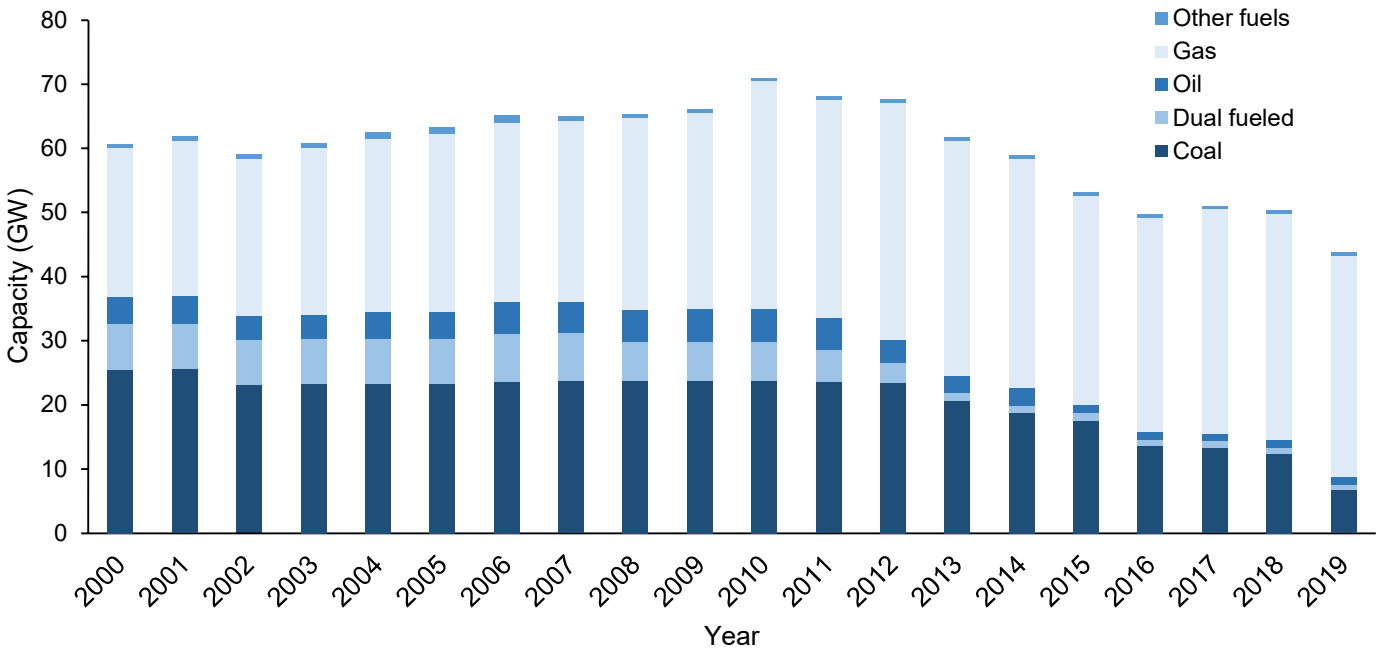


Fossil fuel-fired capacity

Within fossil fuel capacity, there has also been a significant shift in capacity by fuel. At the beginning of the 21st century, coal-fired capacity was just over 25 GW, with gas-fired capacity standing at 23 GW. Throughout the next decade, gas-fired capacity rose steadily to a peak of 37 GW in 2012, but coal-fired capacity remained relatively stable until the UK Government introduced the Carbon Price Floor (CPF) in April 2013. This increased the cost of coal-fired generation relative to gas and, along with the impact of EU regulations, led to the closure of almost all the UK's coal and oil plants, resulting in the swift decline of coal and oil generation capacities. Dual fuelled plants' capacity followed a similar trend to that of coal and oil since the majority of these stations have both coal and oil-firing capabilities. Whilst fossil fuel capacity declined overall in the last decade, gas-fired capacity remained relatively stable, fluctuating around the 35 GW mark. This is largely because of the rapid decline in coal capacity, which resulted in gas generators being required to meet the demand. The expansion of renewable technologies in recent years rendered gas generators less dominant in both the capacity and generation mixes, although they still provide more electricity and have a higher generating capacity than any other fuel. Gas generators provided 34.5 per cent of capacity in 2019, down from a peak of over two fifths of the total in 2013. Coal generators, which dominated the capacity mix in the 20th century and provided over one third of capacity in 2000, provided only 6.8 per cent of capacity in 2019. Oil and dual fuelled stations have also largely fallen out of the capacity mix, providing a total capacity of less than 2 per cent in 2019.

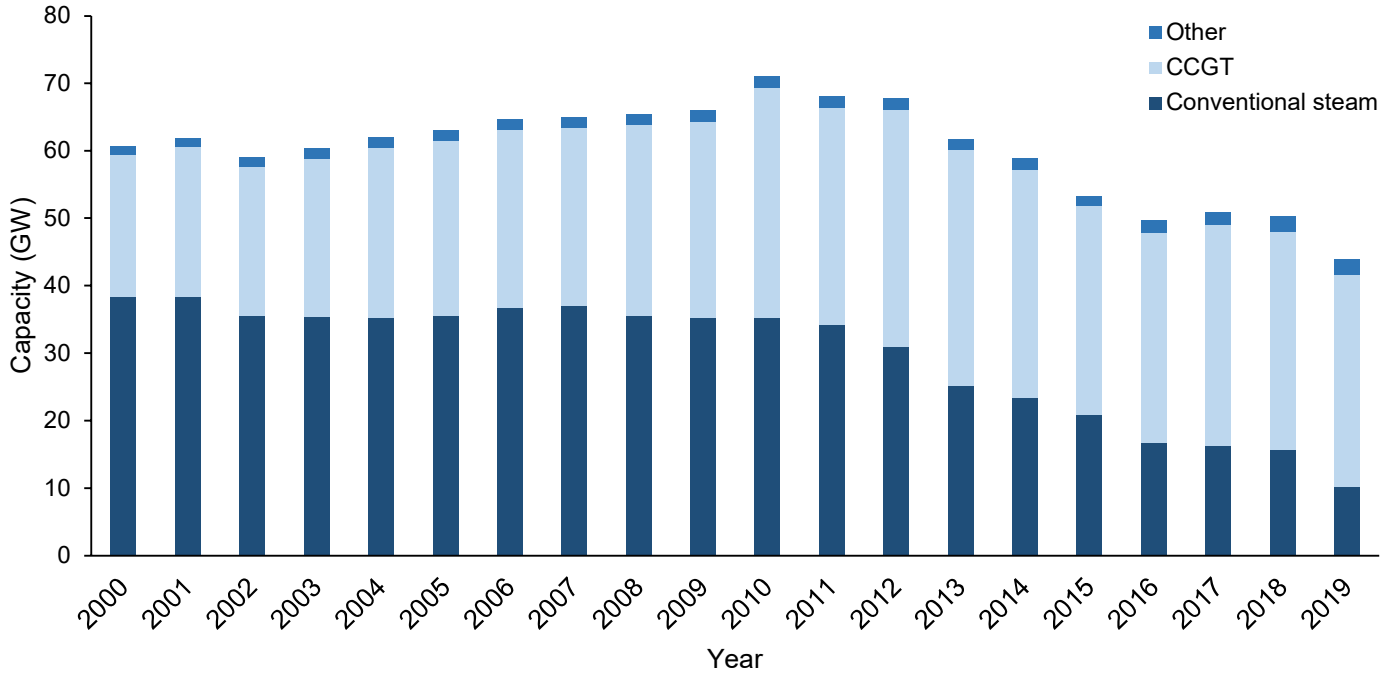
In 2019, coal capacity fell by a further 5.5 GW following the closures of Cottam, Aberthaw B and Eggborough. This was depleted further following the closure of Fiddlers Ferry in 2020. At the time of writing, just four coal plants remain in the UK. The three coal-only plants have a combined capacity of 5.3 GW, while Kilroot, which is a mainly coal-fired station with oil-firing capabilities, has a capacity of 0.6 GW. The UK's remaining coal plants are expected to be phased out by October 2024 as the UK works towards net zero carbon emissions by 2050. Drax will close its remaining coal units in 2021, whilst Kilroot plans to convert to gas by winter 2023. Plans for the closure of Ratcliffe and West Burton are yet to be finalised.

Chart 3: Installed capacity of fossil fuel-fired plants in the UK by fuel, 2000 to 2019.



These trends are mirrored in the installed capacity of different types of fossil fuel-fired plant over the time series. Chart 4 shows how installed capacity of different types of plant has varied over time based on the capacity figures by plant type published in DUKES table 5.7. The changes in gas generation capacity closely align with those for Closed-Cycle Gas Turbine (CCGT) stations, since the majority of gas generation capacity is from CCGT plants. Conventional steam plant capacity closely mirrors that of coal, since the majority of conventional steam stations are coal-fired, or dual-fuelled using mainly coal. In the past decade, conventional steam capacity has declined rapidly, following the winding down of coal and oil. Since the closure of Littlebrook D in March 2015, there have been no oil-fired conventional steam stations in the UK. It should be noted that conventional steam capacity in chart 4, as in DUKES 5.7, does not include bioenergy-fired conventional steam plants, for which capacity has increased in recent years following the conversion of coal plants to biomass firing capabilities at Lynemouth and Drax.

Chart 4: Installed capacity of fossil fuel-fired plants by type, 2000 to 2019.



Renewable technologies

The capacity of renewable technologies has expanded dramatically since the turn of the millennium, with both technological developments and streams of funding to endorse renewable electricity generation resulting in an upsurge in the number of renewable generators across the UK. Until 2005, renewable capacity made up less than 5 per cent of the total UK capacity, with most of this from hydro (natural flow) and bioenergy generators. The Renewables Obligation (RO) was introduced in 2002 to support large-scale renewable projects and helped instigate more widespread development of wind and solar farms across the UK. As a result, onshore and offshore wind capacity rose steadily in the 2000s, before starting to rise more rapidly towards the end of the decade. Most currently operational large-scale projects are supported by the RO, which closed to new capacity in March 2017, subject to a grace period.

Solar generation capacity rose sharply following the introduction of the Feed-in-Tariffs (FIT) scheme in 2010, which primarily supported small-scale generators with a capacity up to 5 MW. In 2010, less than 100 MW of capacity was from solar generators, less than 0.1 per cent of the UK capacity mix. However, by 2015 solar generators provided one tenth of the total for the first time, with solar capacity increasing over 100 times in five years to 9.5 GW. In the same year, onshore wind also exceeded a tenth of capacity with the capacity of renewable technologies providing a third of the total for the first time. Since the RO closed in 2017, the expansion of solar and onshore wind generation capacity has slowed with the number of new small-scale generators also falling due to the adjustment of the FIT scheme. The scheme finally closed to new capacity in March 2019, subject to a grace period and some time-limited extensions.

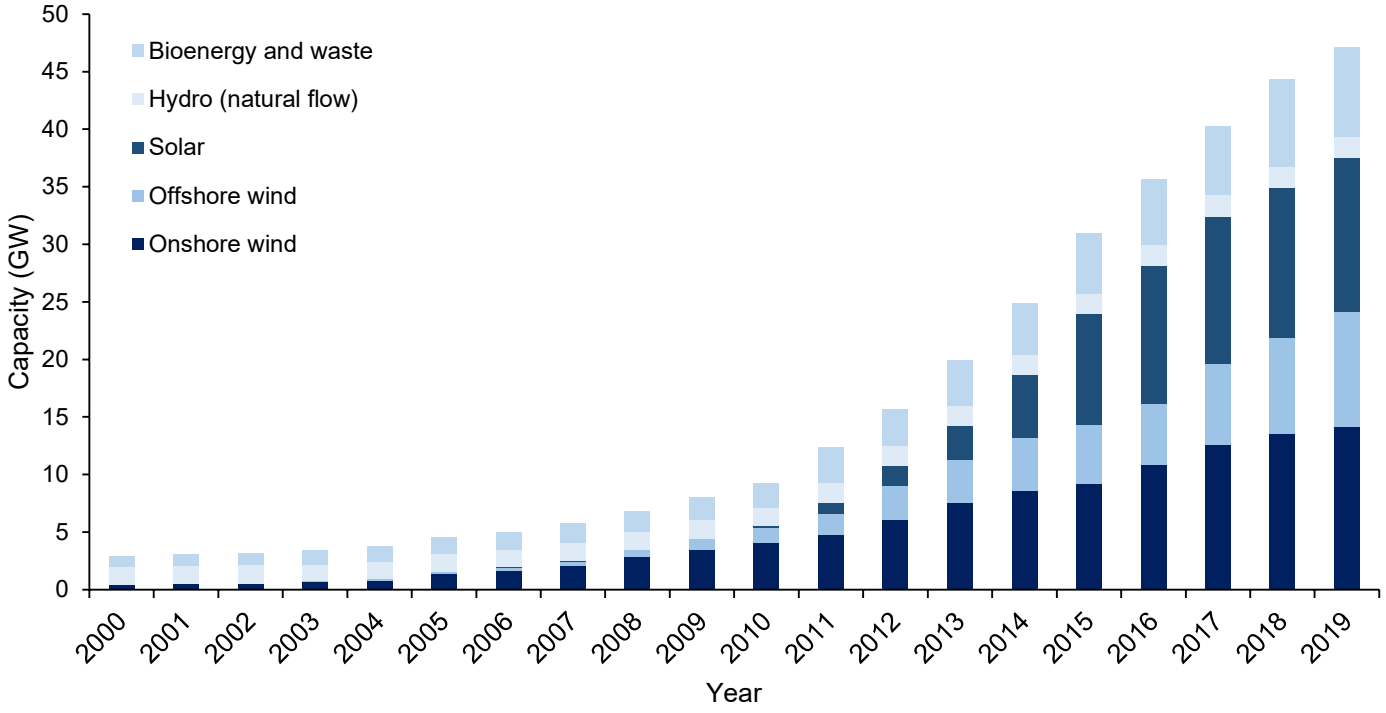
As coal plants closed in the UK, several large coal units were converted for biomass generation capabilities. Lynemouth's 420 MW coal unit was converted to biomass in 2018, while Drax, which is now the UK's largest bioenergy generator, has converted four of its coal units to biomass since 2013, which have a combined capacity of 2.6 GW. In 2019, these two sites constituted the overwhelming majority of the UK's plant biomass capacity which totals 4.5 GW, and a substantial part of the 7.8 GW of bioenergy and waste capacity.

The Contracts for Difference (CfD) scheme is now the government's main mechanism for supporting the development of renewable technologies. There have been three contract allocating rounds since 2014, with a fourth due to take place in 2021. Initial projects supported by the CfD scheme were first commissioned in around 2019, with CfD notably providing support to large offshore wind farms including Hornsea One and East Anglia One. The first phase of the 1.2 GW Hornsea One project came online in 2019, with the 0.7 GW East Anglia One project becoming fully operational in 2020. Following this, offshore wind generators provided over 10 GW of capacity in 2020. With the continuing upsurge in renewable generation capacity and the decline of fossil fuels, renewable technologies provided 47.0 per cent of capacity in 2019, exceeding the fossil fuel capacity share for the first time. The dominant renewable technology in terms of generation capacity is currently onshore wind, which provided 14.1 GW in 2019, which solar generators providing 13.3 GW.

As a particular result of the continued expansion of offshore wind, 2020 renewable capacity now stands at just over 48 GW, which is just under half the UK's total installed capacity. Provisional figures also indicate that renewable electricity generation in the UK exceeded that of fossil fuels for the first time in history in 2020.

Chart 5 illustrates the growth of installed capacity of different renewable technologies over the last twenty years. Note that in this chart, a very small amount of shoreline wave and tidal capacity is included in offshore wind.

Chart 5: Installed capacity of renewable generation assets, by technology, 2000 to 2019.



Derated renewable generation capacity

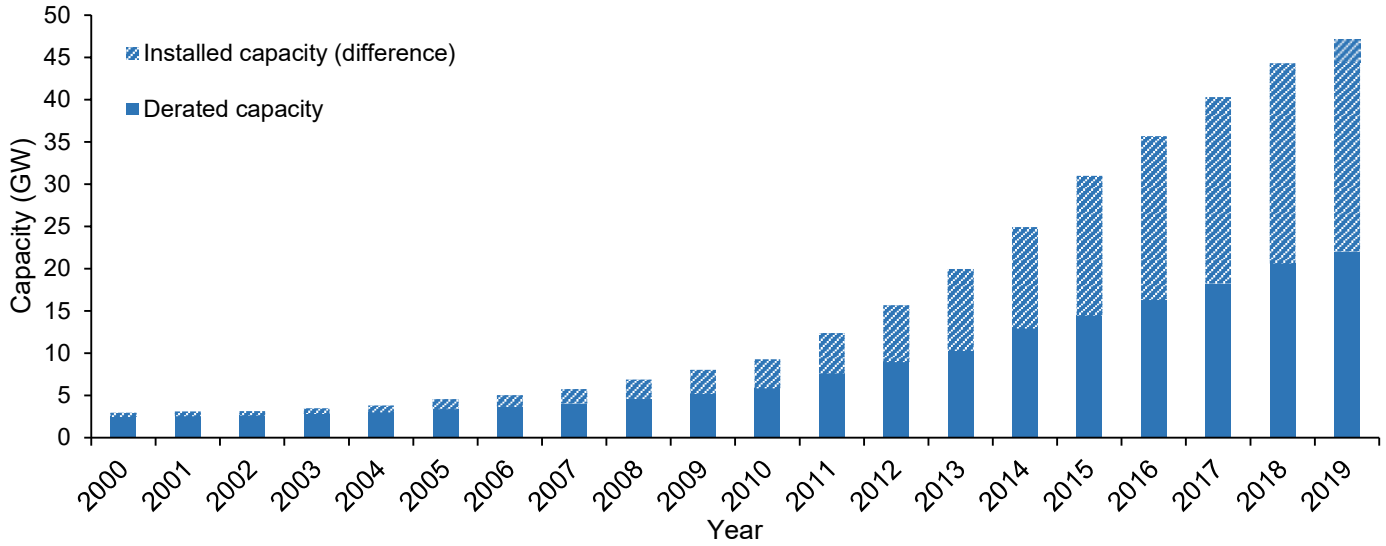
In charts 1 and 5, the electricity generation capacity of renewable technologies is shown on an installed capacity basis. Renewable generation capacity can also be represented on a derated basis which considers the intermittency of different renewable technologies, allowing for a more direct comparison with other technologies. The derated capacity is calculated by applying a scale factor to the installed capacity which accounts for the variability of the energy source (see Table 1).

Table 1: Scaling factors for calculating the derated capacity of renewable energy generation sources.

Technology	Scale factor
Wind	0.430
Solar photovoltaics	0.170
Small-scale hydro plants (capacity up to 5 MW)	0.365

Electricity generation in wind, solar and hydro stations is dependent on weather conditions, namely wind speeds, sun hours and rainfall respectively. The operational capacity of thermal renewable (bioenergy and waste) sources does not vary with weather conditions, whilst large-scale hydro stations are less dependent on rainfall. De-rated capacity is a useful metric for monitoring the capacity required to meet demand, since more intermittent renewable technologies cannot be relied upon to consistently generate electricity at their installed or ‘nameplate’ capacities. DUKES Chapter 6 provides load factors for renewable electricity generation for different technologies. These represent the amount of electricity generated as a percentage of the maximum load. Chart 6 shows how derated capacity has varied over time, alongside changes in renewable installed capacity.

Chart 6: Electricity generation capacity of UK renewable assets derated for intermittency, 2000 to 2019.



The future of electricity generation capacity in the UK

The capacity mix is certain to continue to change in the coming years, as the UK seeks to achieve its goal of net zero carbon emissions by 2050. The complete phase out of coal generation is expected by 2024, while all nuclear plants except Sizewell B and Hinkley Point C (which will begin generating in the mid-2020s) expected to cease operations by 2030. BEIS modelling suggests that overall demand for electricity could double by 2050, driven by a shift to electric vehicles and electricity replacing gas for heating. Generation capacity will therefore have to increase significantly in order to replace retiring capacity and keep pace with demand.

The government has set a target of having 40 GW of offshore wind capacity by 2030, with several onshore and offshore wind sites currently under construction and expected to become operational by 2023. A further 5.8 GW of remote island onshore wind and offshore wind capacity gained funding in the third CfD allocation round, with this expected to become operational by 2025. A further 12 GW of renewable capacity is aimed to be allocated in the fourth CfD allocation round, taking place in late 2021.

Hinkley Point C, which was the first nuclear power plant to begin construction in the UK in over 20 years is due to commission in the mid-2020s, with its two European Pressurised Reactors (EPRs) providing a combined 3.2 GW of capacity. With the existing nuclear fleet largely retiring over the next decade, the construction of two more EPRs at Sizewell C have been proposed by EDF Energy. The government will also provide funds for the development of Small Modular Reactors (SMRs) and Advanced Modular Reactors (AMRs), which aim to provide cost-competitive nuclear power by the early-2030s.

Fossil fuel fired generation is not expected to end completely, with ambitions for the deployment of power carbon capture, usage and storage (CCUS). The first gas-fired CCUS station is expected to be operational by 2030 for the generation of low carbon electricity.

Further information on the future of electricity generation in the UK can be found in the UK Energy White Paper, published in December 2020, which includes illustrative scenarios of how the electricity generation mix could look in 2050, based on BEIS modelling.

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Data for this article

The data used to produce this article can be found in the Digest of UK Energy Statistics (DUKES) chapters 5 and 6, as well as Energy Trends chapters 5 and 6 (see references below).

References

Digest of UK Energy Statistics 2020 (DUKES) – Electricity (Chapter 5):

https://www.gov.uk/government/statistics/electricity-chapter-5-digest-of-united-kingdom-energy-statistics-dukes

Digest of UK Energy Statistics 2020 (DUKES) – Renewables (Chapter 6):

https://www.gov.uk/government/statistics/electricity-chapter-6-digest-of-united-kingdom-energy-statistics-dukes

Electricity generation and supply article and accompanying data for Scotland, Wales, Northern Ireland and England, 2016 to 2019:

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UK electricity generation and consumption (Energy Trends 5.1 to 5.6):

https://www.gov.uk/government/statistics/electricity-section-5-energy-trends

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https://www.gov.uk/government/statistics/energy-trends-section-6-renewables

Energy Trends: weather

http://www.gov.uk/government/statistics/energy-trends-section-7-weather

Energy White Paper: Powering our net zero future

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Domestic wood consumption revised baseline

Key headlines

In December 2020, The Department for the Environment, Food, and Rural Affairs (Defra) published the results of research conducted by Kantar Public to understand people's domestic burning behaviours including an estimate of wood fuel consumption for the residential sector. As part of the publication a summary report compared the results of the Kantar survey data for 2018-19 with consumption published in The Digest of UK Energy Statistics (DUKES) for 2018. It is now proposed that this new estimate is incorporated into the DUKES energy balances. This will result in a downward revision, provisionally estimated to be by 1.5 mtoe, from 2.2 mtoe to 0.7 mtoe.

Introduction

The most recent review of the baseline for domestic wood consumption was in 2014 in response to a paper by The Concerted Action on the Renewable Energy Directive (CA-RES[1]) recommending a large-scale survey to address suspected weaknesses in existing baselines for EU member states. The paper acknowledged the challenges in obtaining reliable estimates particularly for countries with low wood use such as the United Kingdom. The department for Business Energy and Industrial Strategy (BEIS, Department of Energy and Climate Change at the time) commissioned a survey to address this and the results can be viewed via the following link:

https://www.gov.uk/government/publications/summary-results-of-the-domestic-wood-use-survey

This survey focussed solely on burning wood fuels indoors and specifically excluded outdoor burning as this is not a requirement for DUKES energy balances. The scope of Defra's survey, 'Burning in UK Homes & Gardens', published in December 2020, was wider and included outdoor burning and other non-wood fuels, as the policy context was to improve the evidence base on the overall contribution of domestic combustion to air pollution, particularly fine particulate matter ($PM_{2.5}$) which can have an impact on human health and the environment. The research was not only quantitative but also included qualitative research to assess individuals' practices and attitudes to burning fuels

The full results of Defra's survey can be found via the following link;

http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=20159&FromSearch=Y&Publisher=1&SearchText=AQ1017&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description

Annex A of the results, 'UK domestic solid fuels use estimates paper', discusses several reasons why the results may have differed so significantly. These are summarised in the following paragraphs.

Difference in methodologies

There are two established approaches to estimating wood fuel consumption;

1. Hours of operation; this takes the number of hours a respondent has said they used their appliance and an energy value is calculated using typical fuel input for a particular type of appliance.
2. Quantity estimates; an energy value is calculated using the weight or volume of wood fuel and uses assumptions for wood fuel properties such as calorific values and moisture content.

[1].https://ec.europa.eu/eurostat/documents/38154/4956233/Quality_standard_statistics_wood_fuel_consumption_households_CA-RES_2012.pdf/52593e32-cb01-0fc9-0d19-33e03c0d6ad0?t=1607942361438

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Each approach has its drawbacks but stakeholder views from both surveys confirmed that the hours of operation is more reliable as there are fewer assumptions to consider. Despite this both the BEIS and Defra surveys included questions to enable either methodology to be used.

Where the BEIS and Defra approaches differed, is that BEIS used the first methodology only. As this survey asked questions only relating to wood fuel, it was assumed that all fuel was wood. Defra on the other hand were interested in other fuels such as coal so used a hybrid methodology whereby the first methodology was used to produce an energy value for each respondent. This was then apportioned to the energy values of each fuel calculated from the second methodology.

Table 1 Comparison of key assumptions and variables;

Key variable comparisons	BEIS 2018[1]	Defra 2018 19	Source of Defra figure[2]
Proportion of households burned in previous **year**	7.5%	6.9%	Section 4.1.1 Annex A
Proportion of households burned in previous **week**	-	Min 1%, max 6.5 %	Section 4.1.1 Annex A
Average hours of operation;			**Table 8, Annex A**
Spring	-	15.1	
Summer	10.0	8.7	
Autumn	-	20.8	
Winter	22.0	27.9	
Proportion of fuel type			**Table 7 Annex A**
Wood fuel	100%	52%	
Coal	-	47%	
Other	-	1%	
Appliance proportions			**Table 10 Annex A**
Open Fire	45%	32%	
Closed Stove	52%	60%	
Pellet stove	0.5%	-	
Manual boiler	0.4%	-	
Range cooker	1.3%	-	
Other	0.8%	8%	
Fuel use assumptions (kWh/h)			**Table 10 Annex A**
Open Fire	17.6	17.6	
Closed Stove	9.2	9.2	
Pellet stove	7.5	-	
Manual boiler	20.0	-	
Automatic boiler	37.5	-	
Range cooker	8.9	-	
Other		18.5	
Total consumption (mtoe)	**2.2**	**0.7**	

Both surveys used the same typical fuel consumption assumptions for open fires and stoves, differing only for more niche appliances which were so few, this would not have had a material impact on the final results.

The average hours of operation were not directly comparable as BEIS' survey took a two-season approach compared to Defra's four seasons. However, as they appear to be sufficiently similar it is unlikely that that this would have accounted for much of the difference.

[1] Although BEIS survey covered the year 2014, the value for 2018 is shown as the most relevant period for comparison with Defra's 2018-19 period.
[2] Data relating to the BEIS survey can be found in the publication tables; https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/576953/Summary_Tables_Domestic_Wood_Survey.xlsx

Number of wood fuel burners

Although the proportion of households who had burned wood fuel in the previous year (6.9 per cent) was similar to that reported in BEIS' survey (7.5 per cent), on a week-by-week basis, the proportion was considerably lower, inferring that respondents were not consuming wood fuel on a regular basis and was as low as 1 per cent over the summer months (section 4.1.1 of Annex A). BEIS' survey was conducted as a one off, asking respondents to refer to just two historic seasons so it is possible that the average hours reported related to just those weeks they had burned, not accounting for periods when they did not burn anything. In contrast, the Defra survey asked respondents had they burned any fuel in the previous week, ensuring non-burning weeks were captured. It is likely that this is the main cause of difference between the two sets of results.

Alternative fuels burned

Although BEIS' survey asked respondents had they burned other fuels, this was framed as additional information and the key survey questions related to just wood fuel. The calculations were thus based solely on the hours of operation in conjunction with appliance assumptions. It is possible that respondents did in fact burn other fuel types during those hours reported. In contrast, the Defra survey used both the hours of operation but then allocated to fuel types gathered from the quantity questions. This resulted in a significant amount of coal being assigned to both open fires and wood stoves; Table 7 in Annex A (of the Defra publication) showed that just over half (52 per cent) of heat generated by all appliances was allocated to wood fuel with the remainder being from coal (47 per cent) and 'other' fuels (1 per cent).

Summary

Obtaining accurate estimates for heat generated by wood fuel in domestic appliances is challenging, given the difficulty in independently estimating supply of a fuel with both formal supply channels but also informal channels from waste and gathered wood, and although it is considered that user surveys will produce the best estimates it remains an imperfect methodology. By asking respondents to recall their burning habits in the previous week, the Defra survey will no doubt have improved accuracy compared to the BEIS survey which relied on respondents recalling their behaviour up to a year previously. However, there are still some areas for consideration such as the high proportion of coal being burned on indoor appliances, particularly as the share of stoves has increased since the BEIS survey was undertaken (from 52 per cent to 60 per cent). Although anecdotal evidence suggests few indoor burners burn coal on stoves, the results from Defra's research shows that this may be more prevalent than originally thought.

The Defra-funded survey covered the period April 2018 to March 2019 and BEIS intends to adjust this using a methodology based on heating degree days[3] to obtain a calendar year estimate for 2018 to incorporate into its baseline. The impact of this adjustment is unlikely to materially affect the estimated downward revision (from 2.2 mtoe to 0.7 mtoe). The final figure will be published in DUKES 2021 (to be published in July 2021). Any user feedback will be welcomed and can be submitted via the following email address; renewablesstatistics@beis.gov.uk.

[3] Heating degree day statistics can be found via the following link; https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/963776/ET_7.1_FEB_21.xls

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Upcoming developments in dissemination of Energy Trends and the Digest of UK Energy Statistics

Key headline

This article sets out recent changes in our monthly and quarterly publications on energy production and consumption and sets out a future direction of travel for our annual publications and the way in which we aim to offer data to users in the future. We welcome views on this outline.

Recent changes to Energy Trends

Since the end of 2020 we have taken the opportunity presented by the Web Content Accessibility Regulations to revisit and revise our Energy Trends Publication. The main changes are:

- We have improved accessibility of documents and spreadsheets in line with the legislation, for example providing alt text commentary, improving the clarity of the text and footnoting, and providing ODS copies of the data to sit alongside the XLS versions.

- For the document itself, we have consciously targeted it towards inquiring citizens. The document is shorter and covers the principal developments over the last quarter rather than providing a fully comprehensive account of production and consumption. The chapter is a high-level summary that will vary in length each edition depending on the key stories.

- Other user personas are served by access to the underlying data, in both ODS and XLS formats.

We will continue to use the quarterly versions of Energy Trends as a vehicle for both consultation and dissemination of topical issues.

Upcoming developments for the Digest of UK Energy Statistics (DUKES)

We intend to update DUKES in line with the changes to Energy Trends. In particular:

- Simplify and improve the clarity of the text to make the document of greater value to the inquiring citizen persona. This will include moving significant parts of the methodology notes to a separate methodology document along with a focus on the key stories over the last year.
- Improve how easy our spreadsheets are to read by revising formatting and footnotes.
- Provide ODS data for the key chapter outputs alongside XLS outputs
- Continue to review our outputs to ensure continued compliance with legislation.

Longer term direction of travel

Whilst the guiding principle of the main written documents for dissemination (Energy Trends and DUKES) will be to make them short, clear, and aimed at inquiring citizens we are keen to develop our offerings to other users who need and want better access to the underlying data.

We would welcome views on **what** is made available and **how** it is made available.

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In terms of the '**what'**, our initial thoughts are to prioritise changes to the presentation of data in the order shown below:

1. Key commodity balances in DUKES, then
2. Key monthly series from Energy Trends, then
3. Key quarterly data from Energy Trends, then
4. Supplementary tables within DUKES (e.g. lists of power stations, interconnector capacities and other annex data.

In terms of the '**how'**, we are at a very early stage and would welcome comments from users on how we might make data available other than via the XLS and ODS spreadsheets that we currently employ.

These developments are aspirational, and tools will be built organically as and when resource allows. Future developments will follow user feedback and engagement with documents and tools that we make available (e.g., through monitoring of application use and webpage hit counts).

User consultation

Should you have any questions or feedback on the recent changes or proposed developments, please do get in touch. You can contact us at energy.stats@beis.gov.uk

This publication is available from: www.gov.uk/government/collections/energy-trends.

If you need a version of this document in a more accessible format, please email energy.statistics@beis.gov.uk. Please tell us what format you need. It will help us if you say what assistive technology you use.