Department for Business, Energy & Industrial Strategy

Digest of UK Energy Statistics
Annual data for UK, 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

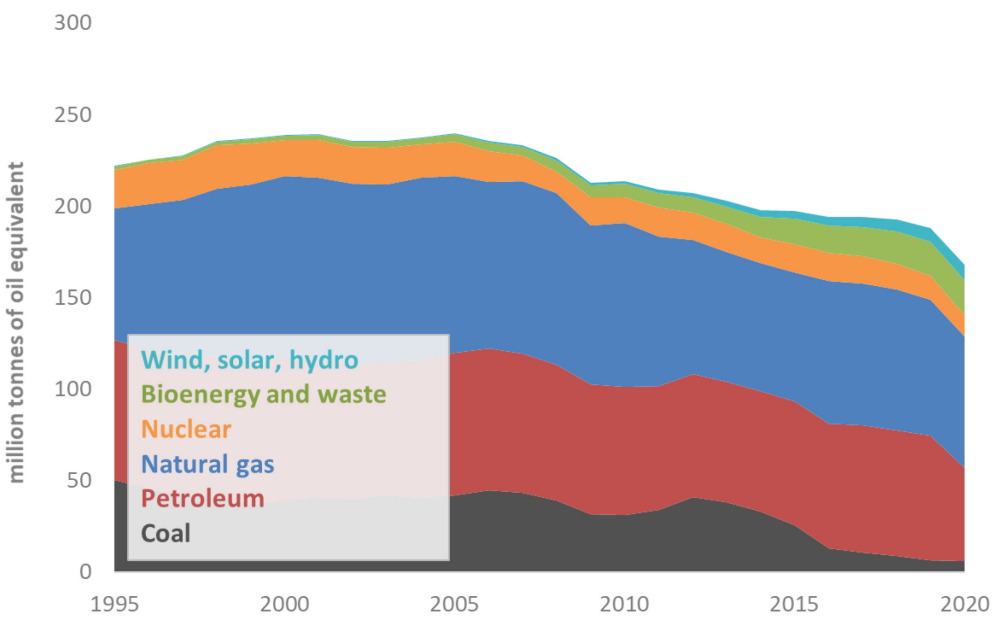
See the full list of tables and annexes for more information. Additional data are available online as part of the DUKES series:

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.

Last year saw an unprecedented drop in energy demand as lockdown restrictions in place to curb the spread of Covid-19 affected economic output, leisure, and travel. The demand for energy in 2020 was similar to that seen in the 1950s when the UK has a far smaller population and notably different demands.

Demand for energy in the UK, 1995 – 2020



The fall in demand was most keenly felt in transport as people travelled less for work and leisure. **Transport demand dropped by 29 per cent compared to 2019**, led by a fall in aviation demand, down 60 per cent. Diesel demand was down 17 per cent and petrol demand down 21 per cent, taking demand for all transport fuels back to the 1980s. **Industrial demand and demand for energy in shops, hotels, and offices also fell** broadly in line with the activity in the wider economy.

Whilst the annual drop was unprecedented, it was not in any way sustained. The reduced demand for fuel was most evident in the second quarter of the year and **demand increased month-on-month from June through to the end of the year** as activity levels returned to closer to normal.

The UK's electricity generation landscape continued to evolve and move away from fossil fuels and towards renewable alternatives. Windy conditions in the Spring of 2020 meant that renewable generation reached record levels and **contributed a 43.1 per cent share of generation, outpacing for the first-time annual fossil fuel generation** which contributed 37.7 per cent of generation, a record low and down from 75.4 per cent in 2010. Despite record low output from nuclear, **strong renewable performance pushed low carbon generation to a record 59.3 per cent.**

Chapter 1: Total energy

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Key headlines

Energy demand in 2020 was at levels last seen in the 1950s as Covid-19 restrictions affected industrial output, work, leisure, and travel. **Energy requirements for industrial use and services (e.g. shops, restaurants, offices) are both down 6 per cent on 2019**. Despite warmer weather, domestic demand was up as more people stayed at home.

Transport fuel demand dropped 29 per cent compared to 2019, led by a fall in aviation fuel, down 60 per cent to levels last seen in the mid-1980s. Diesel demand was down 17 per cent and petrol down 22 per cent. These decreases also takes road transport fuel demand back to the 1980s.

For both transport and other consumption, **the decrease in demand was closely linked to activity** with the indices of production and services both showing substantial contraction during 2020 and substantially reduced demand for air and road transport. **Monthly data available show consumption hitting near record lows in the summer then increasing throughout the year as restrictions eased.**

Total final consumption was down 13 per cent on last year, and 11 per cent on a temperature and seasonally adjusted basis. On the adjusted basis, falls in transport (down 29 per cent), industry (down 6 per cent), and services (down 4 per cent) were not offset by an increase in domestic demand (up 6 per cent).

Renewable generation, as a percentage of generation, continued to grow and **reached a record 43.1 per cent in 2020, outpacing for the first-time annual fossil fuel generation**. Over the last ten years, renewable generation has increased from 6.9 per cent to the current record high. Wind generation is a critical element of renewable's performance, reaching a record high 24.2 per cent up from 2.7 per cent in 2010.

Fossil fuel generation reached a record low, dropping from 75.4 per cent of generation to 37.7 per cent over the last ten years. **Coal generation fell to a new record low**, generating just 1.8 per cent in 2020 down from 28.2 per cent in 2010.

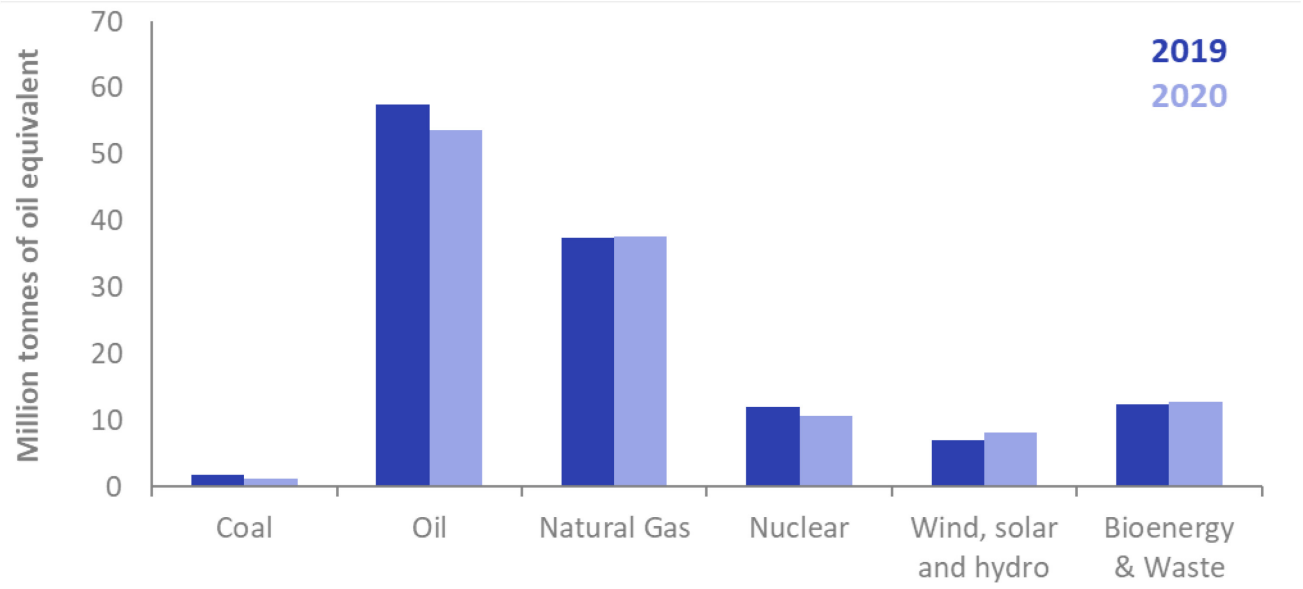
Low carbon generation also reached a record high of 59.3 per cent despite a **drop in nuclear output** due to maintenance outages.

In contrast, **renewable generation capacity changed very little in 2020**, up only 2 per cent on last year. The strong generation figures owe much to the storm activity of the first quarter of 2020. Whilst capacity has grown five-fold since 2010, the growth rate in recent years has been smaller.

Energy production dropped 3 per cent in 2020, with falls in petroleum production and nuclear production, the latter dropping to a record low due to maintenance outages. Coal production also reached a new record low, down to 1.7 million tonnes from 18.3 million tonnes in 2010.

Total renewables accounted for 13.6 per cent of total energy consumption in 2020, up from 11.7 per cent in 2019.

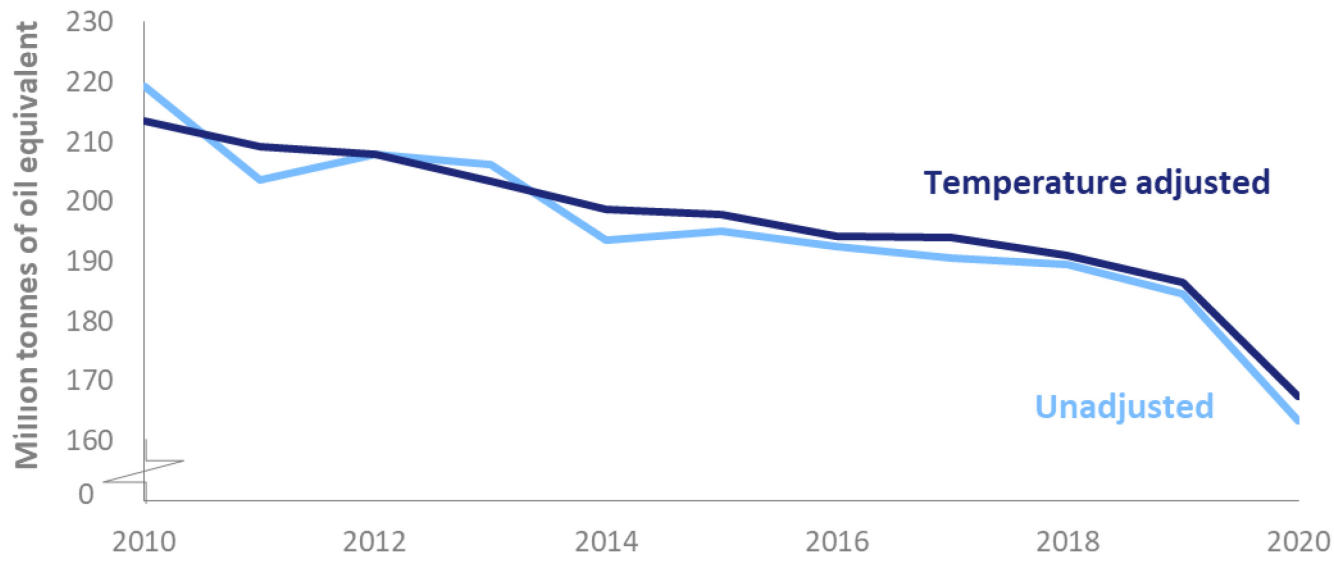
Chart 1.1 Production by fuels, 2019 and 2020 (DUKES Tables 1.1-1.3)



In 2020 total production was 124.1 million tonnes of oil equivalent (mtoe), 3.1 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 disruption arising from the Covid-19 pandemic, and numerous outages at UK nuclear power stations. UK production has fallen year on year since 2018, and production is now 58 per cent below the peak recorded in 1999.

In 2020 coal production fell by 35 per cent to a record low level, whilst output from oil & gas fell by 3.7 per cent due to maintenance activities being delayed in 2020 to the second half of the year because of the Covid-19 pandemic. Nuclear output fell by 11 per cent to a record low level due to prolonged maintenance outages throughout the year which reduced operational capacity at some time for all eight of the UK's nuclear power stations. Wind, solar and hydro output rose by 16 per cent, to a record high level, due to small increases in offshore wind and solar capacity, and more favourable weather conditions. In 2020 the average wind speed was 9.1 knots, 0.8 knots higher than in 2019, as ten named storms affected the UK during the year. Production of bioenergy and waste rose by 3.2 per cent.

Chart 1.2 Primary energy consumption, 2010 to 2020 (DUKES Tables 1.1-1.3)

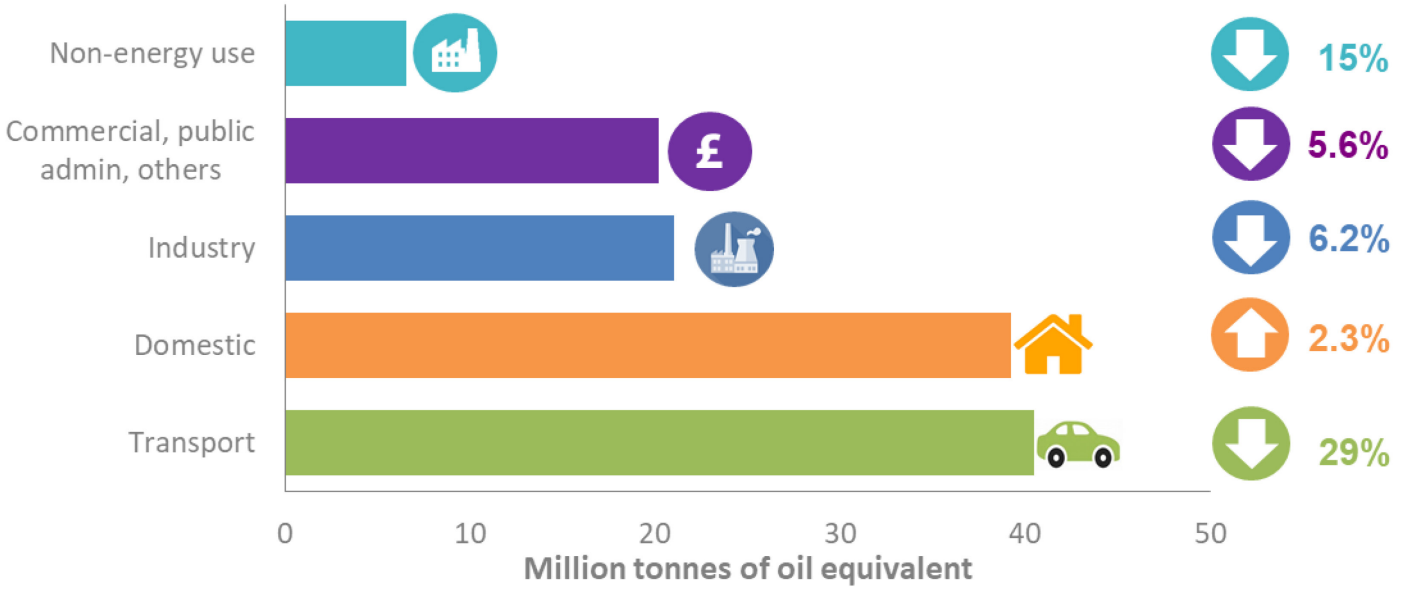


In 2020 total primary energy consumption was 163.3 mtoe, 11 per cent lower than in 2019, and to levels last seen in the 1950s.

Primary energy consumption includes use by consumers, fuel used for electricity generation and other transformation. On a seasonally adjusted and annualised rate that removes the impact of temperature on demand consumption was 167.3 mtoe, 10 per cent lower than in 2019.

In 2020 total primary energy consumption shrank massively, with a noticeably sharp reduction in petroleum consumption as demand for transport fuels fell due to the Covid-19 pandemic lockdowns in place in the UK throughout 2020. Consumption of oil fell by a quarter, to a record low, with sharp falls in petrol, diesel and aviation fuel due to travel restrictions imposed during the Covid-19 lockdown periods. Consumption of coal and other solids fell by 8.2 per cent, to a record low, and consumption of natural gas fell by 5.7 per cent as electricity generators made more use of renewable sources. Consumption of bioenergy & waste rose by 2.9 per cent. Primary electricity consumption fell by 2.5 per cent, within which nuclear fell by 11 per cent to a record low level due to prolonged outages during 2020, but wind, solar and hydro rose by 16 per cent to a record high level, due to small increases in offshore wind and solar capacity and more favourable weather conditions.

Chart 1.3 Final energy consumption by sector, 2020 (DUKES Tables 1.1-1.3)



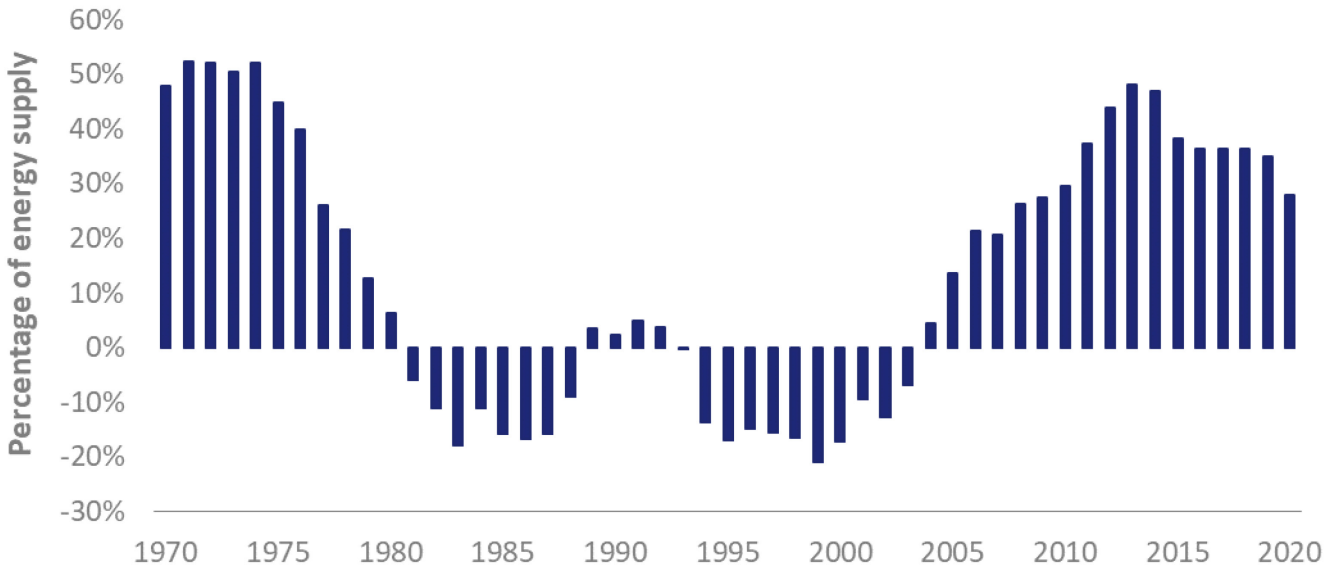
In 2020 total final energy consumption including non-energy use was 127.5 mtoe, 13 per cent lower than in 2019, again matching demand levels from earlier decades.

Consumption levels in 2020 were severely impacted by the Covid-19 pandemic lockdowns imposed from March 2020 onwards. Consumption was also reduced by warmer temperatures in 2020 with the average number of heating degree days down from 5.4 to 5.1.

Domestic sector consumption rose by 2.3 per cent reflecting increased home working, however transport sector consumption fell by 29 per cent due to the introduction of travel restrictions during lockdown, with road transport consumption falling by 18 per cent and air consumption falling by 60 per cent. Industrial sector consumption fell by 6.2 per cent and service sector consumption fell by 5.6 per cent as factories, shops, offices and schools were all forced to closed for a period of time during lockdown.

Final energy consumption excluding non-energy use also fell by 13 per cent, whilst on a temperature corrected basis consumption fell by 11 per cent. Domestic consumption on a temperature corrected basis rose by 6.4 per cent.

Chart 1.4 Net import dependency, 1970 to 2020 (DUKES Table 1.1.3)



In 2020 net import dependency was 27.8 per cent[1], 7.1 percentage points lower than in 2019, and at the lowest level since 2009.

Imports in 2020 at 122.4 mtoe were 18 per cent lower than in 2019, and 32 per cent lower than their peak in 2013. The UK imported less fuel to meet reduced demand in 2020 due to the impact of the Covid-19 pandemic, with falls in imports of coal, primary oil, petroleum products, gas and electricity. The fall in imports of primary oil led to the UK becoming a net exporter of primary oil for the first time since 2004. Exports in 2020 at 74.6 mtoe were 7.5 per cent lower, as rises in coal, gas and electricity imports were offset by falls in primary oils and petroleum products.

Net imports at 47.7 mtoe were 30 per cent lower than in 2019 and accounted for 27.8 per cent of consumption in 2020, down from 34.8 per cent in 2019.

Whilst net imports were down, **the UK continued to increase the use of low carbon fuels**. The main fossil fuel sources in the UK are coal, gas and oil. The low carbon sources include nuclear and renewables such as wind; hydro; solar photovoltaics (pv) and biofuels. In 2020, the share of primary energy consumption from fossil fuels decreased further to a record low of 76.5 per cent, whilst that from low-carbon sources increased to a record 21.5 per cent share, up from 18.9 per cent last year and 10.1 per cent in 2010.

[1] Net imports as a proportion of primary supply (including an addition for the energy supplied to marine bunkers).

Chapter 2: Solid fuels and derived gases

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Key headlines

Demand for coal fell by 11 per cent in comparison with 2019 to 7.1 million tonnes in 2020. This decrease was driven by a drop in consumption by electricity generators, as coal-fired generation is phased out of the UK energy mix.

Consumption of coal for electricity generation fell to a record low, down 20 per cent from 2019 to 2.3 million tonnes in 2020. This decline reflected a lower overall demand for generation in the face of Covid-19 pandemic, the closure of two coal-fired generation plants in March 2020 and included a record time spent using coal-free electricity generation in the Spring of 2020.

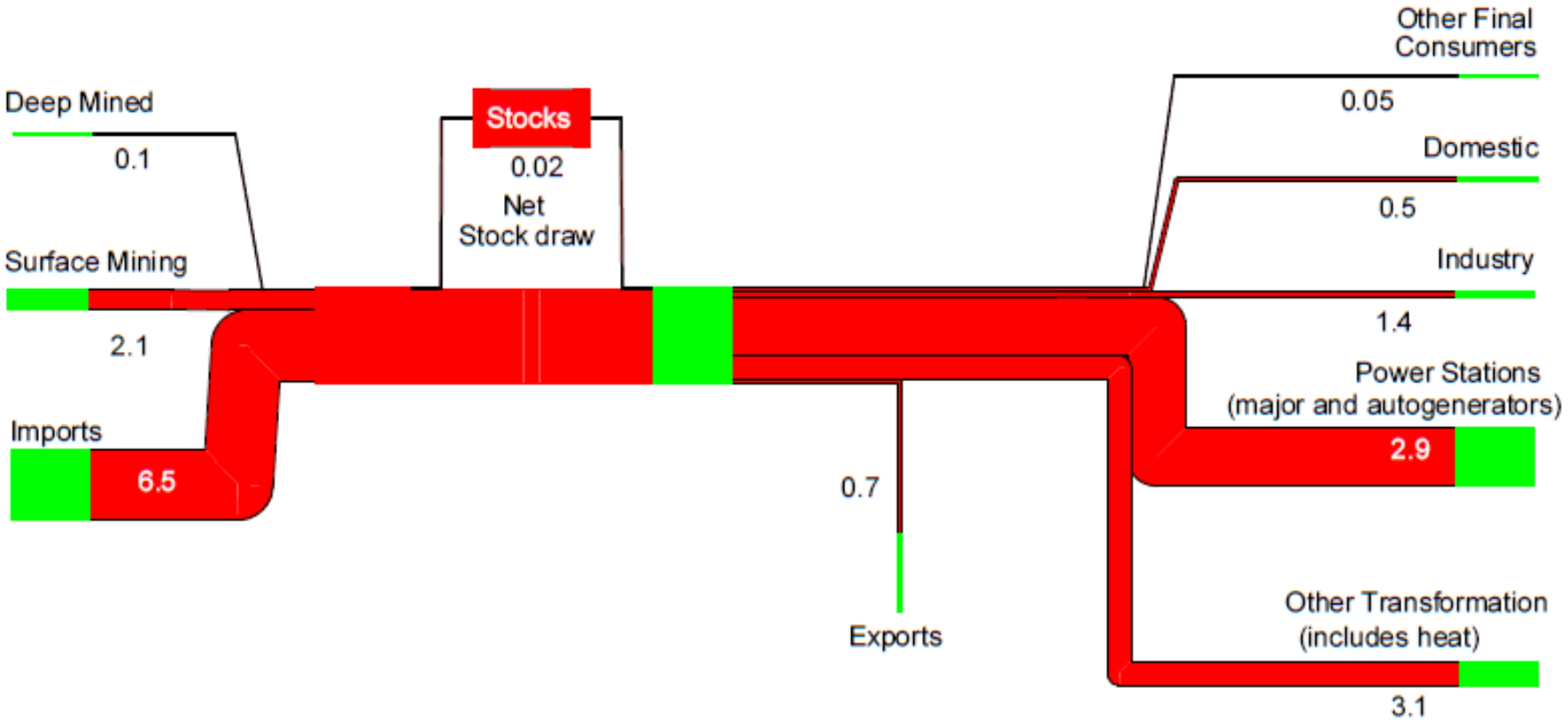
Production of coal fell to another record low, down 35 per cent from 2019 to 1.7 million tonnes. Surface mining production fell to a record low of 1.6 million tonnes due to mine closures, restrictions in coal mines due to Covid-19, bad weather and a flood in one of the mines as well as the falling demand for coal by electricity generators. In the last ten years, UK coal production has fallen by 91 per cent.

Coal imports fell 27 per cent in comparison with 2019 to just 4.5 million tonnes in 2020. Net imports accounted for 45 per cent of supply in 2020. Three countries accounted for 79 per cent of total coal imports: Russia (36 per cent), the USA (22 per cent) and Venezuela (21 per cent).

In 2020, coal comprised 2.9 per cent of UK energy demand, up slightly from 2.8 per cent in 2019 as demand for other fuels contracted more sharply due to the Covid-19 pandemic. Over a longer period, the trend reflects the transition away from coal in the UK's energy mix; coal demand has fallen from a 16 per cent share of UK energy demand in 2000. Most of this coal is used for electricity generation, coke manufacture, or in blast furnaces in the steel industry.

The chart on the next page shows flows of coal from production and imports, through to consumption. It is a way of simplifying the figures that can be found in the commodity balance for coal in Table 2.4. The chart illustrates the flow of coal from the point of supply (on the left) to its eventual final use (on the right).

Coal flow chart 2020 (million tonnes)

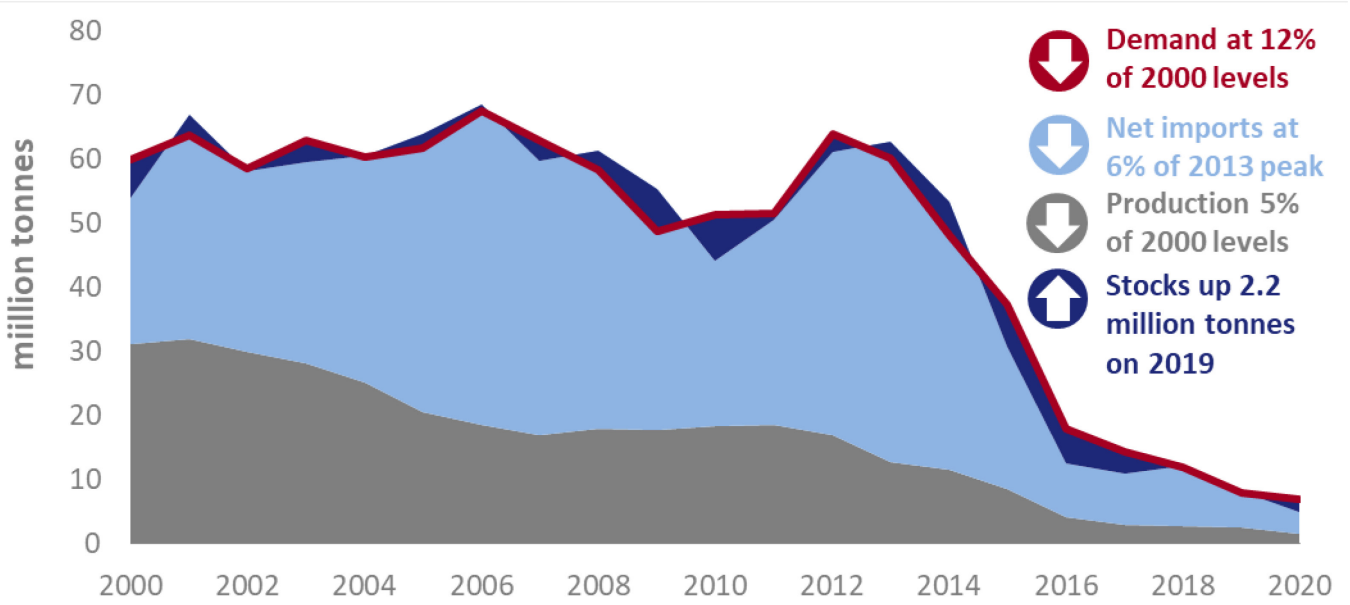


Note:

This flow chart is based on the data in Tables 2.1 and 2.4.
The numbers on either side of the flow chart will not match due to losses in transformation.

Reduced demand for coal drove a substantial contraction in supply, with UK coal production down 91 per cent in the past ten years. In 2020, coal production fell to a record low of 1.7 million tonnes, down 35 per cent on 2019 (Chart 2.1). In that period just under a quarter of demand was met by domestic production, 45 per cent by net imports and 31 per cent was drawn from stocks.

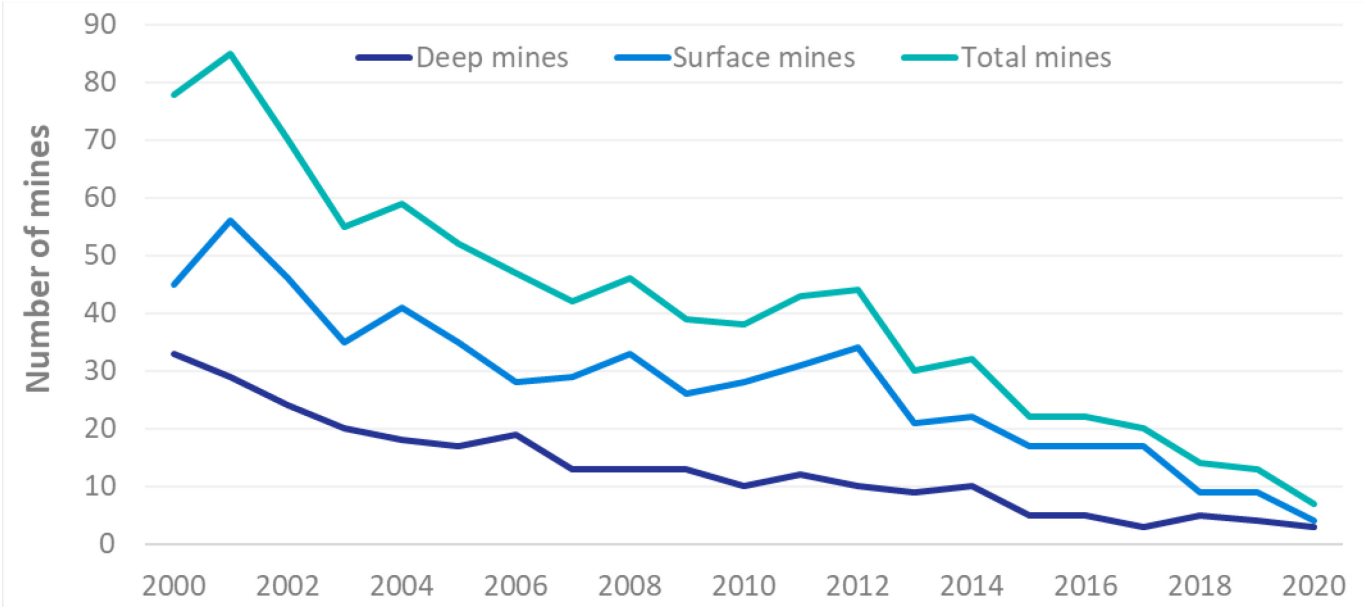
Chart 2.1 UK coal supply and demand, 2000 – 2020 (Table 2.1)



Deep mined production rose to 107 thousand tonnes, mainly due to Aberpergwm colliery increasing production, and was 6.4 per cent of total production. In 2015 deep mined production provided nearly a third of total coal production. This was the year that the last large three deep mines in operation closed - Hatfield, Thoresby and Kellingley. There were no further closures of deep mines in 2020 with nine remaining open, of which two were under care and maintenance. Three deep mines reported coal production in 2020.

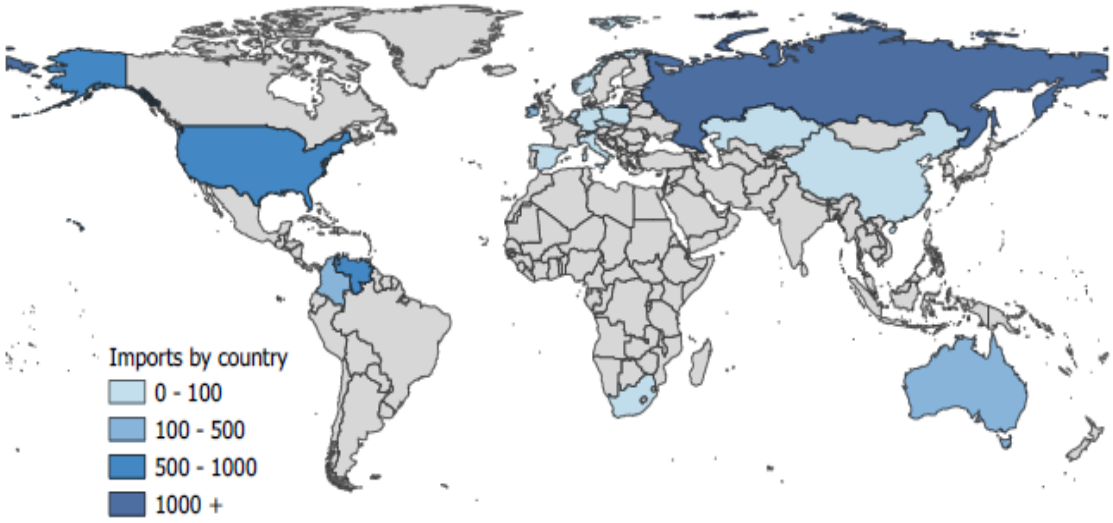
Surface mine production was down 37 per cent, to a new record low of 1.6 million tonnes due to lower demand for electricity generation, restrictions in coal mines due to Covid-19, bad weather and a flood in one of the mines. Six surface mines closed in 2020, with just four remaining.

Chart 2.2 Number of coal mines producing in the UK, 2000 – 2020 (Table 2.7)



Net imports of coal also fell substantially, down 91 per cent from the peak in 2013. This is again a result of the sharp fall in demand for coal. In 2020, net imports fell by 27 per cent from 2019 levels to just 4.5 million tonnes. However, this reduction in imported coal has occurred at a slower pace than the reduction in domestic production, leading to the proportion of net imports in the UK coal supply increasing over the past 20 years. In 2020 imports accounted for 45 per cent of the UK's supply, up 7 percentage points from the proportion in 2000.

Map of UK Coal Imports in 2020 (thousand tonnes)



For more detail on coal imports and exports see DUKES table G.2:
https://www.gov.uk/government/statistics/dukes-foreign-trade-statistics

Steam coal imports were 39 per cent lower at 2.4 million tonnes in 2020 compared to 2019. In 2020 Venezuela became the highest supplier of steam coal imports for the first time rising from 126 thousand tonnes in 2019 to 968 thousand tonnes. There was also a decrease of steam coal imports from Russia of 47 per cent. Steam coal imports from Colombia fell by 86 per cent. Venezuela (40 per cent) Russia (37 per cent) in 2020 represented 77 per cent of steam coal imports. Steam coal accounted for 53 per cent of total coal imports.

Coking coal imports were down 5.5 per cent at 2.1 million tonnes compared to 2019. The decrease was mainly due to the fall of 24 per cent from Australia.

Coal stocks continued to decline year-on-year. In line with much of what we see with coal, the main change to coal stocks came post 2014 when stocks began to decline each year and power plants closed. Coal stocks fell to 3.2 million tonnes in 2020, which was 41 per cent lower than in 2019.

As of June 2021, the Coal Authority estimates that overall there are 3,814 million tonnes of coal resources, including prospects (Table 2.8), down 2.4 per cent from 3,906 million tonnes assessed in June 2020. Of the economically recoverable and minable coal resource in current operations (including those in the planning or pre-planning process) 986 million tonnes is in underground mines and 46 million tonnes in surface mines. Overall England had a 84 per cent share of UK current mines and licenced resources, followed by Scotland with 9 per cent and Wales 7 per cent.

In prospects, there were 2,050 million tonnes suitable for underground mining and 778 million tonnes suitable for surface mining. Table 2.8 gives details of the resource assessment by England, Scotland and Wales as at 22 June 2021.

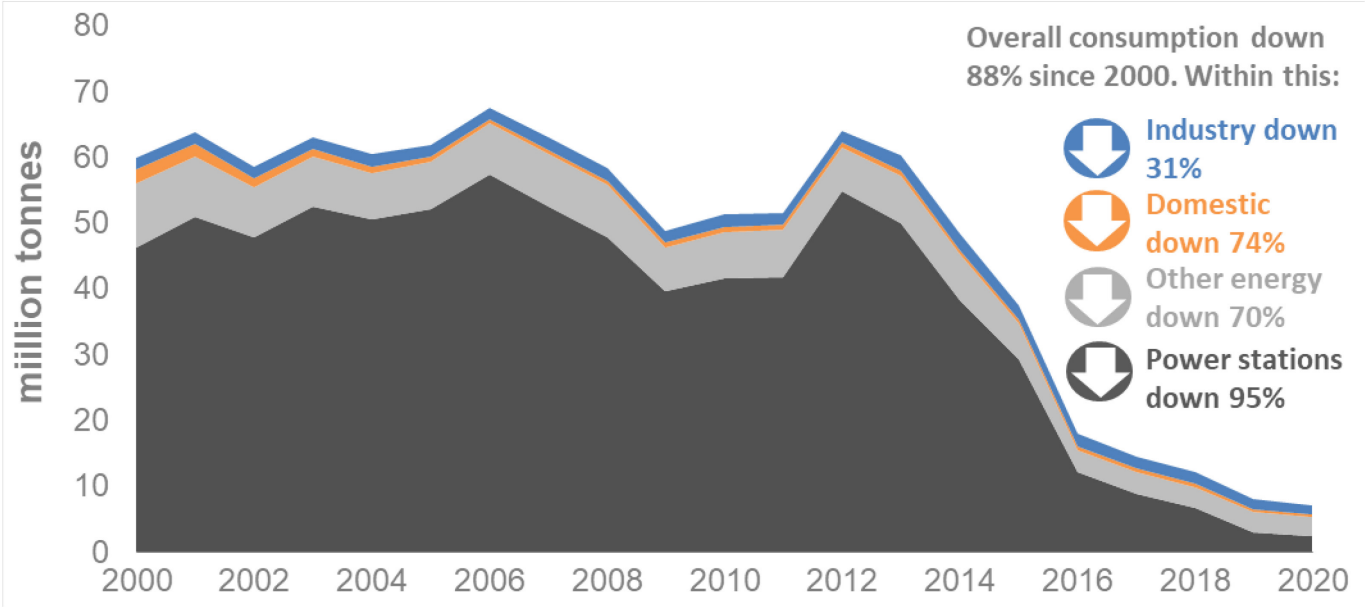
Demand for coal fell by 11 per cent to 7.1m tonnes in 2020, compared to 2019 (table 2.4). Amongst this, demand for coal for electricity generation fell by 20 per cent, final consumption by industry fell by 9 per cent, and transformation for coke manufacture and in blast furnaces fell by 6 per cent.

The Covid-19 pandemic led to a significant fall in demand for electricity, and therefore a fall in demand for coal from power stations for coal-fired generation. Restrictions began on 23rd March 2020 and resulted in closures across the private and public sector, with wide scale closures of schools, shops, offices and industrial facilities.

During this period, Great Britain set a record for its longest coal-free period of generation, with no coal-fired electricity being produced for 67 days from 10th April 2020. On 16th June, one of the remaining coal-fired power stations came briefly back online during maintenance work, adding power to the national grid. However, there was no coal-fired electricity on the GB grid for a further 55 days from 18th June to 12th August 2020. The period without coal-fired generation ended in August, as coal-fired generators were required due to maintenance outages in nuclear plants, low wind speeds, and as gas-fired generators struggled to generate at their maximum capacity in unusually high temperatures. Great Britain operates on a separate electricity network to Northern Ireland, where some coal generation continued during this period. However, coal-fired generation remained less economically favourable due to low gas prices and higher carbon pricing.

A reduction in generation capacity contributed to the downwards trend in coal consumption. There have been multiple closures of coal-fired power plants in recent years, and March 2020 saw the closures of Fiddlers Ferry and Aberthaw B. This trend appears set to continue in the coming years, with plans to phase out the remaining four coal-fired power plants in the UK by 2024. Coal use has declined since the early 1970's as new fuels (gas and renewables) entered the market, and 2020 saw an increase in renewable electricity generation, with favourable weather conditions for increased wind generation.

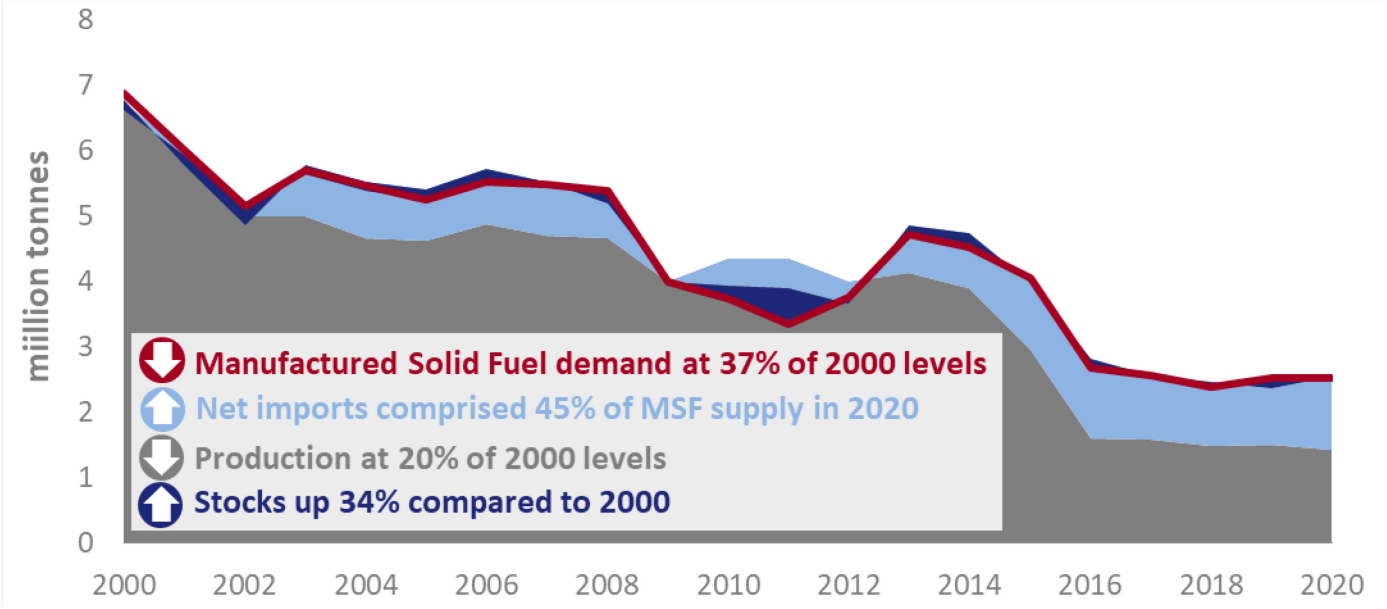
Chart 2.2 Coal consumption, 2000 – 2020 (Table 2.4)



The iron and steel industry is one of the main non-generation users of coal. In 2015, it used 5.2 million tonnes compared to 2.8 million tonnes in 2020 (47 per cent drop). In terms of total share, it comprised 14 per cent of UK coal consumption in 2015, and 39 per cent in 2020.

In addition to coal production and consumption, the UK has significant (but decreasing) supply and demand for a range of manufactured solid fuels that are used for domestic, industrial and transformational processes. Coke is the solid product obtained from the carbonisation of coal, principally coking coal, at high temperature and is used for smelting iron and steel.

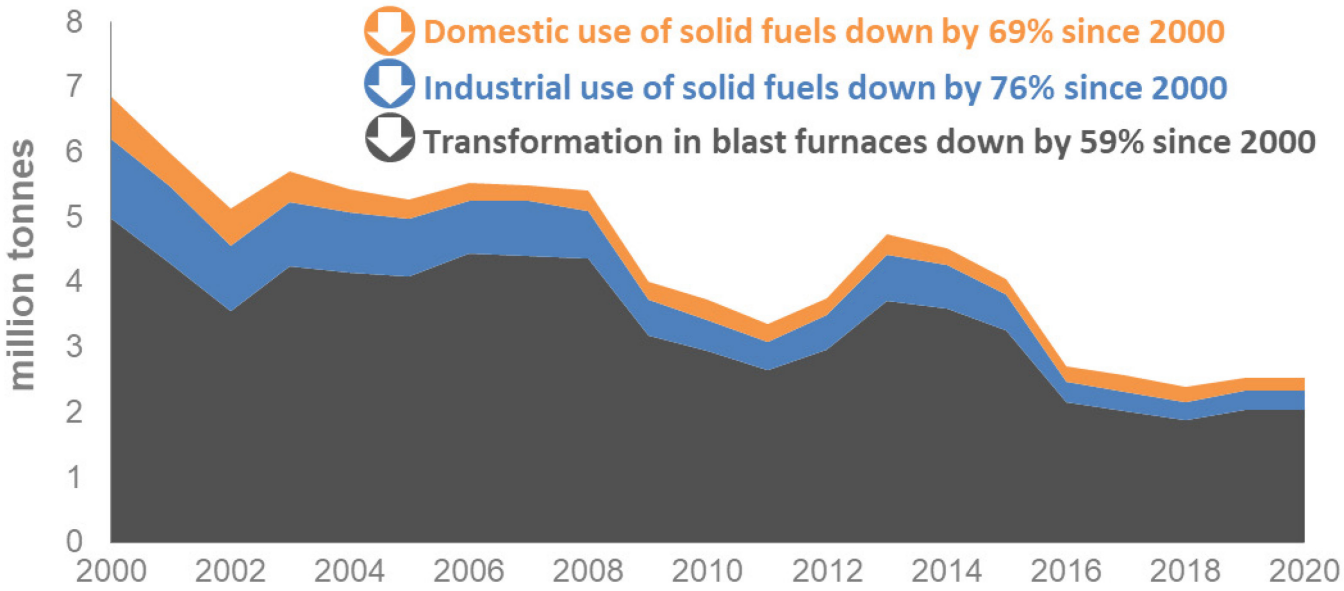
Chart 2.3 Total manufactured solid fuels supply and demand, 2000 - 2020 (Table 2.5)



In 2020, indigenous coke oven coke fell by 7.2 per cent to 1.2 million tonnes compared to 2019 (Chart 2.5). It has been relatively stable in the last four years. Monckton Coke and Chemicals, the only dedicated coke plant in the UK closed in December 2014. There has been a fall in steel production in the UK since 2015. Notably, SSI steelworks at Redcar ceased production in mid-September 2015 (with the subsequent closure in October). Since then coke has still being produced and used at steelworks, mainly Port Talbot and

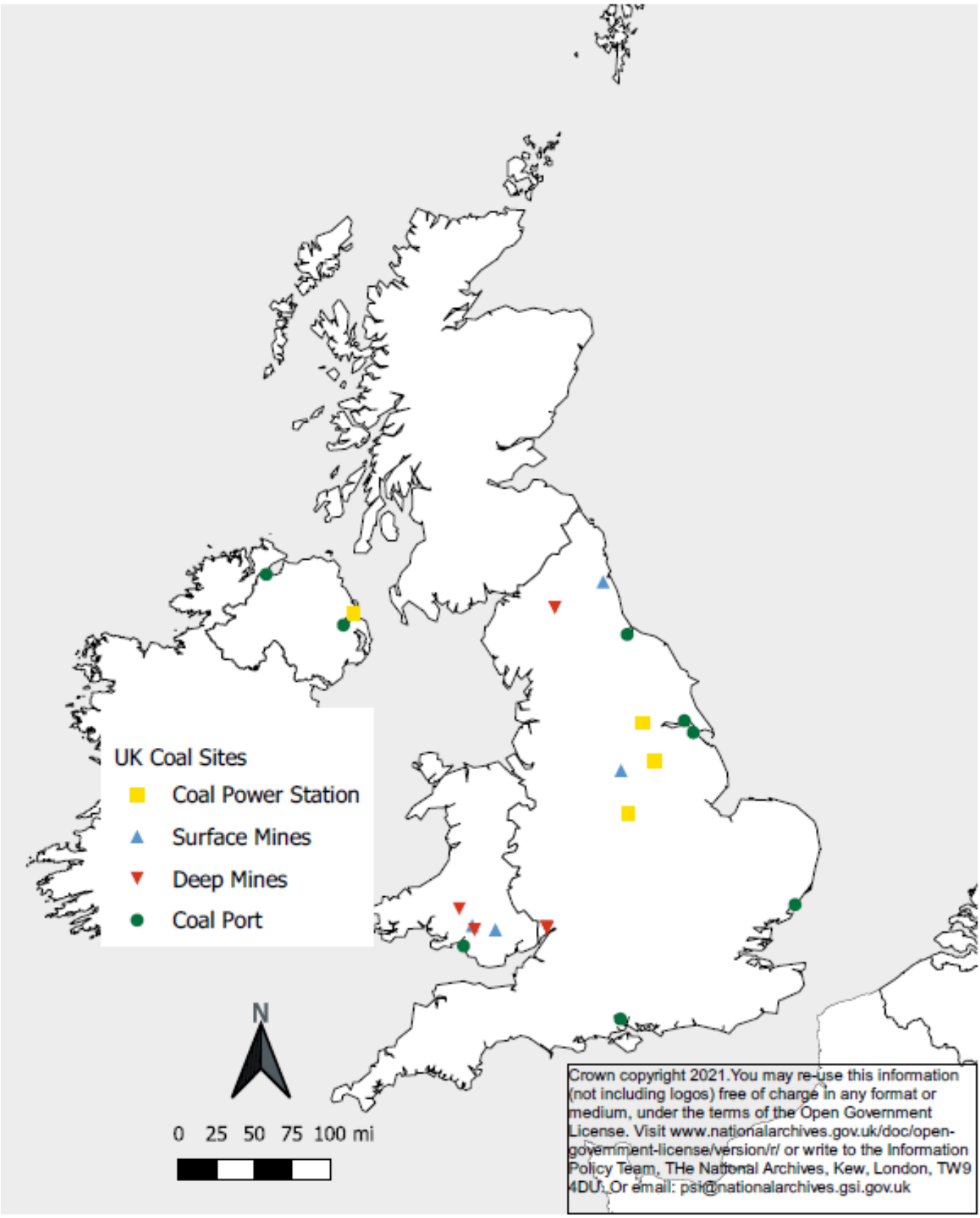
Scunthorpe. Coke breeze fell 16 per cent to 16 thousand tonnes. Other manufactured solid fuels (patent fuels) rose by 8.8 per cent to 198 thousand tonnes.

Chart 2.4 Total manufactured solid fuels consumption in the UK, 2000 – 2020 (Table 2.5)



In 2020, coke oven coke comprised 69 per cent of demand for manufactured solid fuels, with coke breeze at 23 per cent and other manufactured solid fuels at 8 per cent. Almost all coke oven coke and coke breeze in the UK is used in blast furnaces for steelmaking. As the iron and steel industry is a critical industry it was less impacted by the Covid-19 pandemic and volumes have been broadly stable in recent years.

Map 2A Showing location of UK coal production sites and ports as at end 2020



Chapter 3: Oil and Oil Products

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Key headlines

Oil formed one-third of total energy demand in 2020 compared to nearly half in 2019. Demand for petroleum products reached a record low in 2020, down 23 per cent compared to 2019 as restrictions from the Covid-19 pandemic limited activity. Most oil demand is typically for transport fuels which were heavily impacted as movement was restricted. The largest contraction was in demand for jet fuel, down 60 per cent on 2019, the lowest level since 1984. Demand for road fuels was also reduced, petrol fell to the lowest level since 1963 and down by 22 per cent on 2019; diesel also fell by 17 per cent.

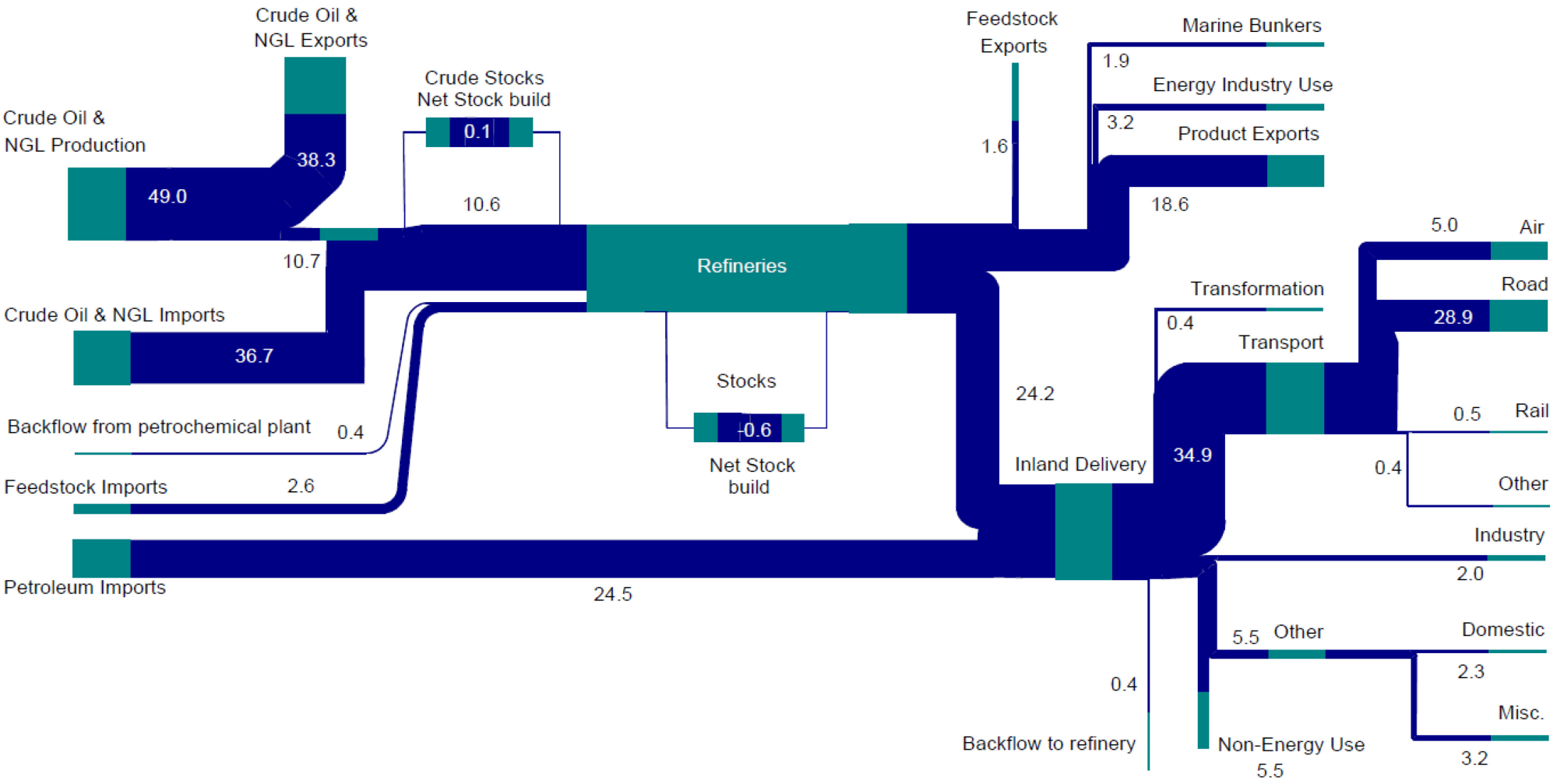
The impact of the Covid-19 pandemic also affected trade. Net imports of petroleum products halved in 2020 as the UK imported less fuel to meet the reduced demand. The UK became a net exporter of primary oils, by 0.5 million tonnes, for the first time since becoming a net importer in 2004.

In 2020 the UK's total production of oil from the North Sea exceeded refinery demand for the first time since 2004. Total demand for primary oils was down 18 per cent on 2019 with refinery production following suit, dropping to its lowest ever level. In contrast production of crude from the UK Continental Shelf (UKCS) retained its 42 per cent share of total UK energy production. Much of this was exported abroad.

Other sectors were also impacted by Covid-19 restrictions. For example, non-energy use fell 9.6 per cent in 2020 compared to 2019 after several years of growth. Conversely, domestic consumption saw an increase of 5 per cent because of low prices early in the year and as more people stayed at home.

The flow chart on the following page shows the movement of primary oils and petroleum products, illustrating how crude oils are supplied and transformed in refineries, and products imported (on the left) to transformation and consumption in the various sectors of the UK’s economy (on the right). The widths of the bands are proportional to the size of the flow they represent.

Petroleum flow chart 2020 (million tonnes)

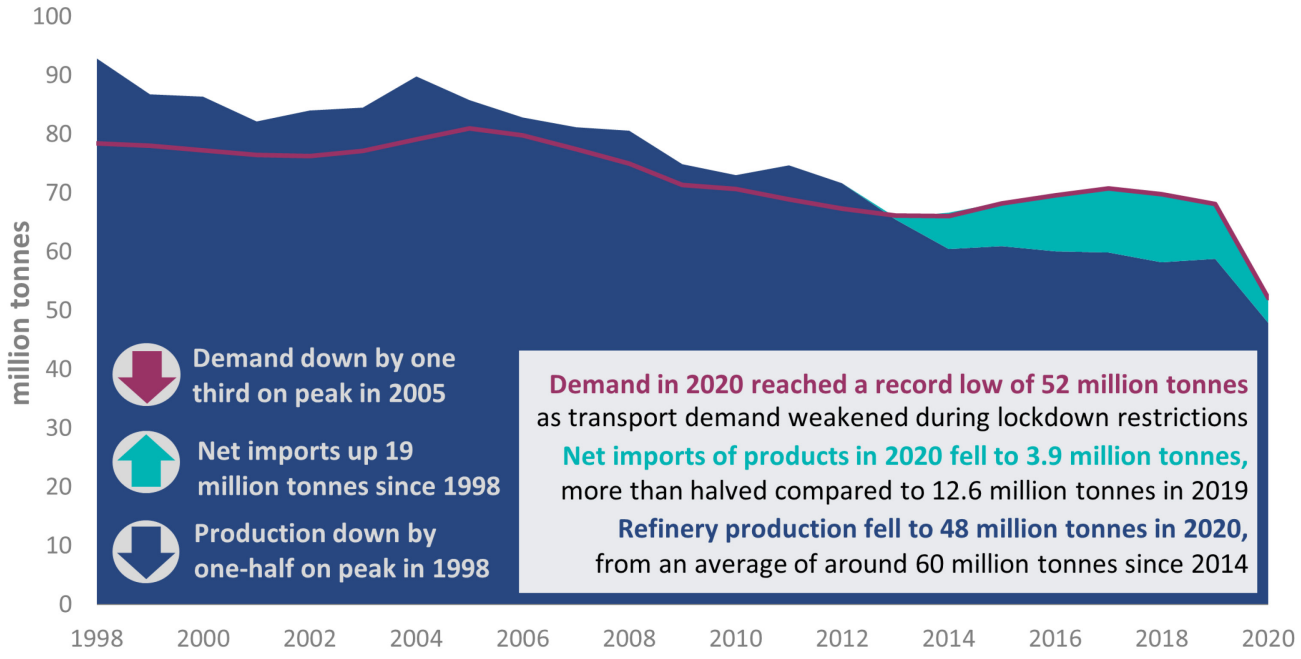


Note:

This flow chart is based on the data in Tables 3.1 and 3.2.
The numbers on either side of the flow chart will not match due to losses in transformation.
Biofuels are not included.

Demand for petroleum products reached a record low in 2020, down by 23 per cent compared to 2019. Most oil demand is for transport fuels, lockdown and other restrictions put in place to curb the spread of Covid-19 reduced demand substantially. Overall demand for petroleum products in 2020 was the lowest since 1962 at 52.1 million tonnes (see DUKES Table Crude oil and petroleum: Production, imports and exports).

Chart 3.1 Supply and demand for petroleum products, 1998 – 2020 (DUKES Table 3.1)



Refinery operators reacted by slowing production in response to the demand destruction brought about by the pandemic, meaning that refinery production also reached a record low of 48 million tonnes in 2020. This was down by more than 10 million tonnes compared to 2019[2]. While the UK remained a net importer of petroleum products, with net imports up by 19 million tonnes since 1998, in 2020 there was a sharp fall and net imports dropped by half to just 6.0 million tonnes from 12.1 million tonnes in 2019.

Covid-19 restrictions saw demand for road fuels fall markedly in 2020 compared to 2019. This follows several years of static demand at around 35 million tonnes. In 2020, demand for petrol and diesel fell 22 and 17 per cent respectively compared to 2019. Staggeringly, over the year demand for petrol reached the lowest recorded since 1963 owing to the sharp dip in the second quarter. This was less dramatic for diesel, demand reaching the lowest recorded since 2005. There are several reasons for this disparity; demand for petrol was impacted more than diesel because commercial fleets tend to be diesel-engine vehicles, and these continued to operate during the UK's periods of restricted movement. In addition, there has been slowing growth in the diesel vehicle fleet in recent years following changes to vehicle taxation and diesel vehicles have become more efficient. As 2020 progressed and restrictions were lifted demand continued to recover through the year, reaching near normal levels despite subsequent lockdowns by the end of the year (for quarterly data see Energy Trends Table 3.4).

Demand for jet fuel was down 60 per cent in 2020 compared to 2019, at just 5.0 million tonnes this was the lowest level since 1984. This was caused by international travel restrictions which remained in place for large parts of the year. Unlike the road fuels, which have shown remarkable signs of recovery, demand for aviation fuel remained flat in 2020.

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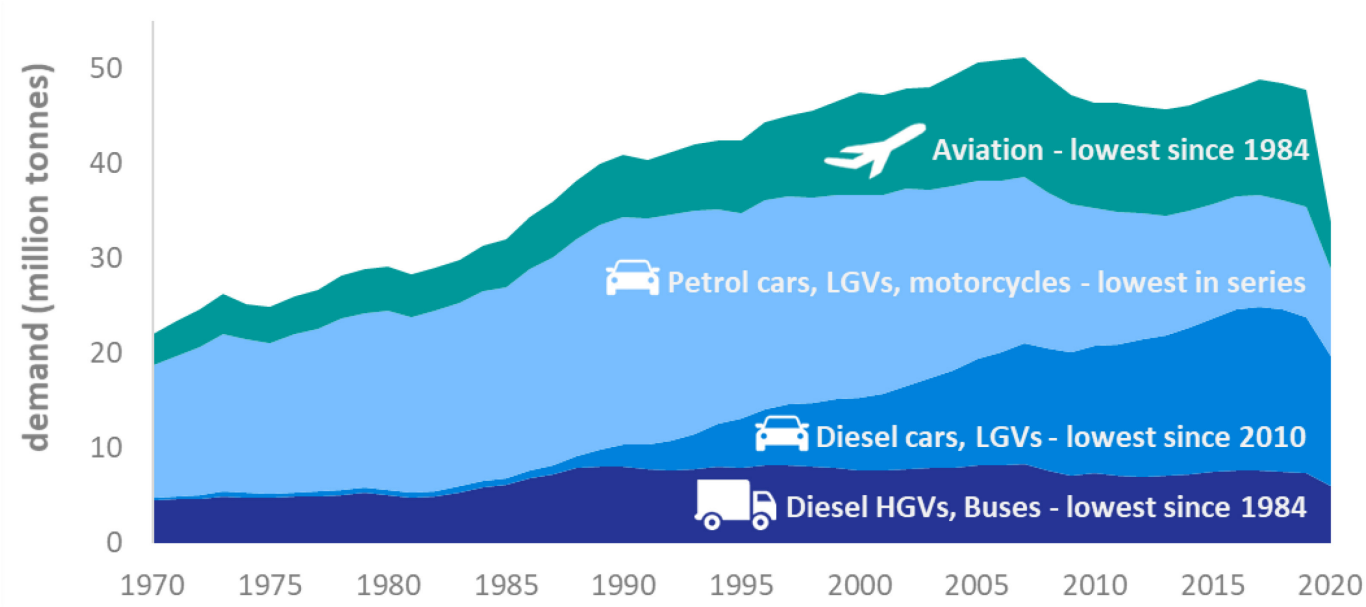
[2] For further detail on the UK's refineries and nameplate capacity, please see Table 3A and the map of UK refineries and major import terminals in the methodology note.

Chart 3.2 Annual demand for road and aviation fuels since, 1970 - 2020 (DUKES Table 3B)

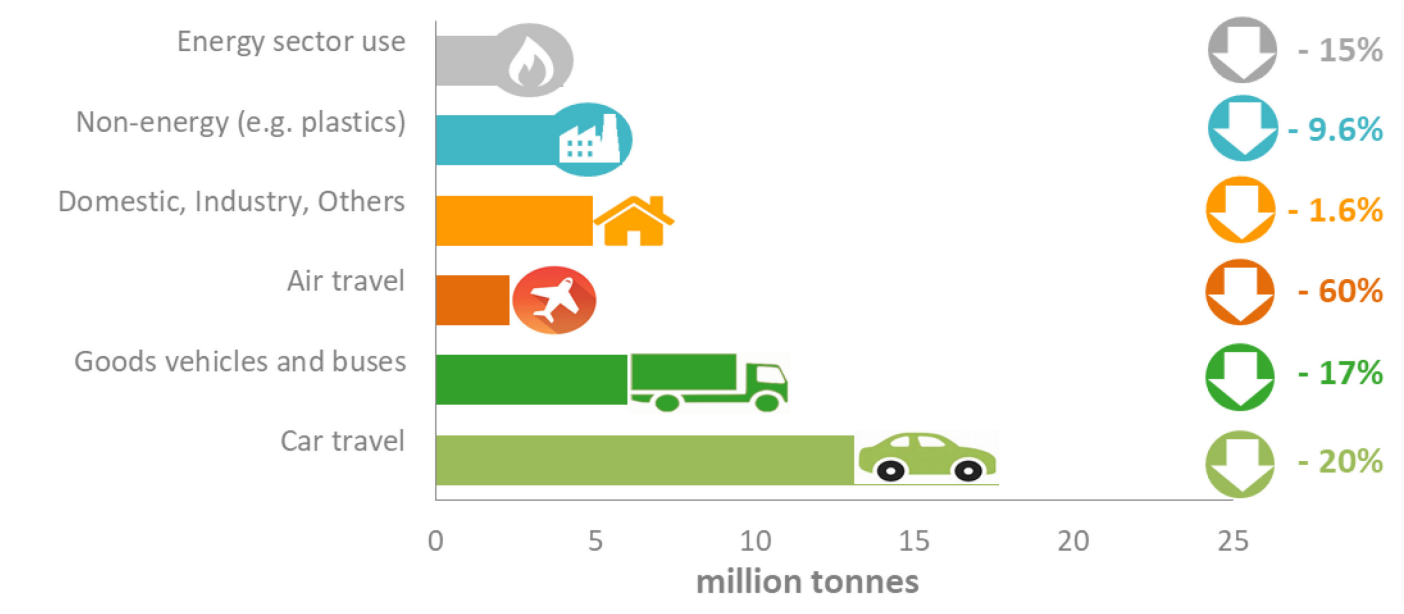


The restrictions imposed in response to the pandemic had differing effects on specific sectors. Domestic consumption increased by 5.0 per cent as more people stayed at home due to the pandemic. In addition, low oil prices in early 2020 caused by excess stocks, and an oil price war between Russia and Saudi Arabia, led to a bump in demand early in the year as consumers took advantage of lower prices to fill domestic heating tanks.

Chart 3.3 shows that consumption by industry and other final users decreased by 1.6 per cent, although this masks variation within the subsector. Domestic demand was up by 5.7 per cent, largely because of exceptional demand early in the year during a period of very low prices owing to the collapse of OPEC+ talks. However, industry demand was down by 3.2 per cent and commercial by 5.0 per cent because of closures due to restrictions in place to control the spread of Covid-19.

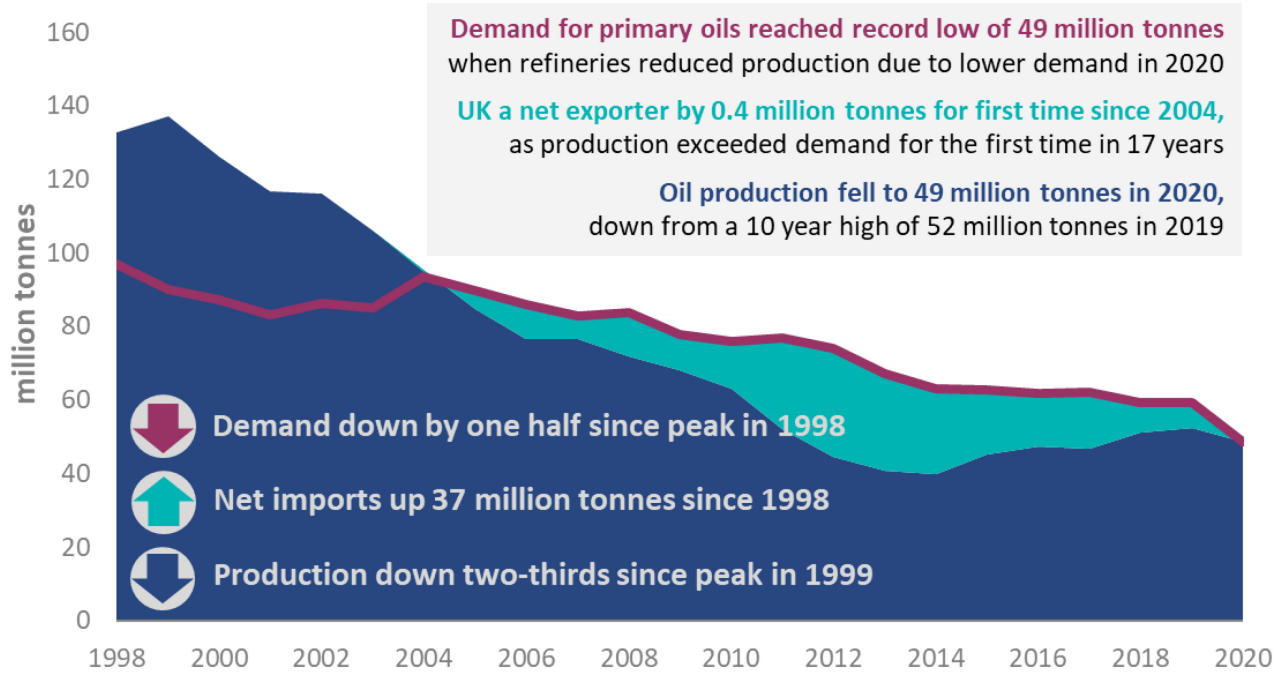
Non-energy use of oil products was down by 9.6 per cent compared to 2019. Use of oil in the energy industry dropped by 15 per cent as demand for generation fell to a record low during a year of record renewables generation.

Chart 3.3 Oil consumption in the UK, 2019 to 2020 (DUKES Table 3.2 to 3.4)



In 2020 the UK's total production of primary oils exceeded refinery demand for the first time since 2004. Demand for primary oils was down by 18 per cent on 2019 whereas production remained relatively robust, down just 7.0 per cent compared to 2019.

Chart 3.4 Supply and demand for primary oils, 1998 – 2020 (DUKES Table 3.2 to 3.4)



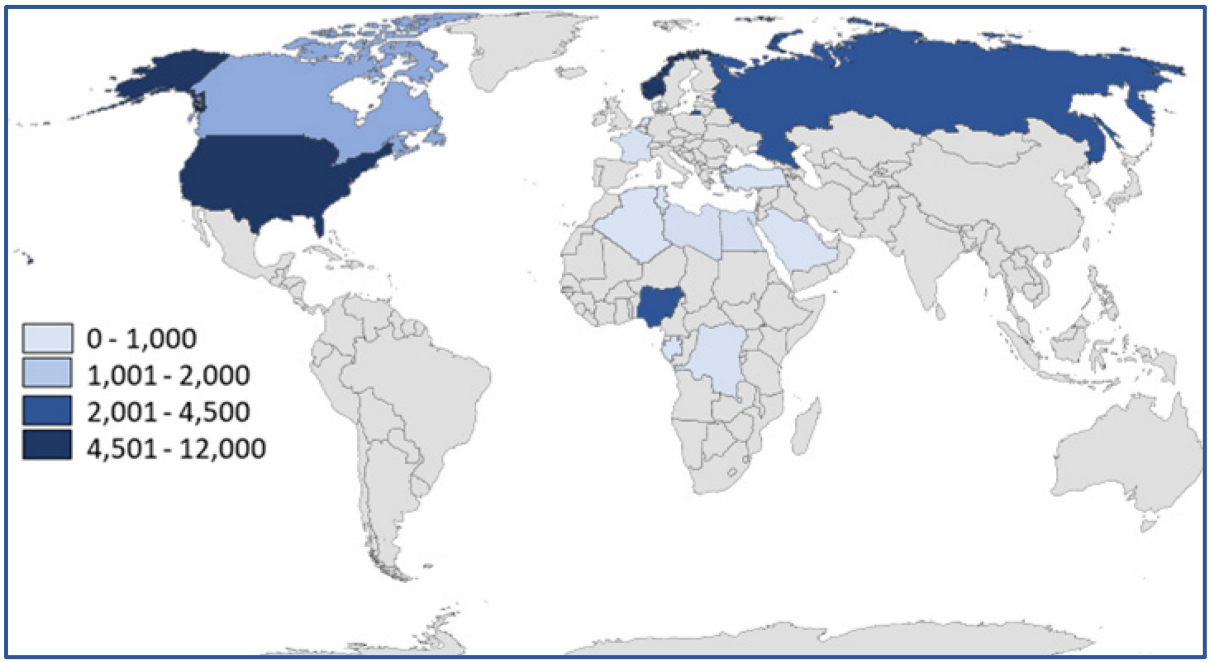
In the longer term, from a peak of 137 million tonnes in 1999 UKCS production of primary oils has dropped by nearly two-thirds to 49 million tonnes in 2020. The UK became a net importer of primary oils in 2005, but net imports fell to a 17-year low in 2020, and the UK became a net exporter for the first time since 2004.

Despite this, the UK remains reliant on imports to meet refinery demand for specific crude blends. UK refineries took receipt of 8.6 million tonnes of crude produced from the UKCS in 2020 (a five-year high, see Energy Trends Table 3.10), this met 18 per cent of refinery demand. This in addition to reduced demand saw imports of crude fall by a quarter in 2020 compared to 2019.

Sources of crude imports are shown in Map 3A; the main source has historically been Norway given its proximity to the UK. Imports from Norway remained stable in 2020 compared to 2019, with Norway providing 34 per cent of total UK imports. However, this stability follows recent sharp decreases; in 2016 Norway provided 62 per cent of UK imports (Table 3.9). Imports from the US remained stable in 2020 at the record set in 2019 of 11.4 million tonnes.

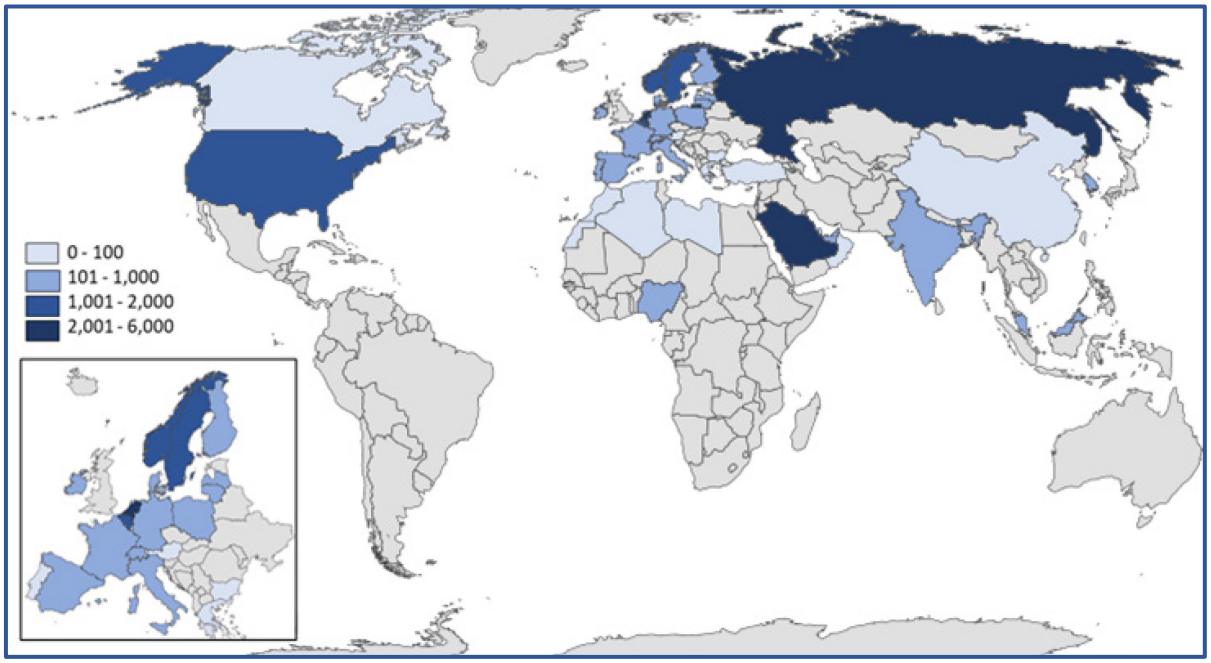
The US share of UK imports reached 32 per cent in 2020 from 26 per cent in 2019 mainly at the expense of imports from Norway and Algeria. Imports from OPEC countries accounted for 13 per cent of the UK's crude imports in 2020 at 4.6 million tonnes, this is almost half the figure for 2019. The UK is a significant exporter of crude oils, and these remained comparatively stable at 36 million tonnes in 2020 compared to 41 and 40 million tonnes in 2019 and 2018 respectively, which followed strong production and favourable price spreads resulting in strong demand for Brent crude from Asia (Table 3.10).

Map 3A Sources of UK crude oil imports 2020 (thousand tonnes, DUKES Table 3.9)



As with crude oil, imports of petroleum products are critically important to meet UK demand. Despite the Covid-19 pandemic leading to as sharp reduction in imports of petroleum products in 2020, the UK has been a net importer since 2013 and remained so in 2020. In common with many other countries, domestic supply and demand are not matched on a product-by-product basis. The UK's refineries were developed to produce petrol and fuel oil for electricity generation. However, as demand for diesel and jet fuel have increased UK refineries have not been able to keep pace and now produce a surplus of petrol. To balance demand the UK trades widely and is one of the largest importers of jet fuel and road diesel in the OECD, and one of the largest exporters of petrol.

Map 3B Sources of UK petroleum product imports 2020 (thousand tonnes, DUKES Table 3.9)



Map 3B shows the principal product trading partners with the UK. Historically the bulk of products have come via the Netherlands, which acts as a major trading hub (the fuel might have been refined elsewhere in Europe or beyond). Russia, the Netherlands, and Saudi Arabia were large sources of road diesel in 2020; these three countries accounted for 62 per cent of total road diesel imports in 2020.

Another effect of the pandemic has been the impact on emergency reserves of oil. Under international commitments to the International Energy Agency, and until 1 January 2021 the European Union, the UK is obliged to hold oil stocks to offset the impact of significant disruptions to the global oil market. Such disruptions are relatively rare, but since the Arab Israeli war of 1974 there have been three globally co-ordinated releases of oil in response to the Gulf War (1990–1991), Hurricane Rita (2005), and the civil war in Libya (2011).

At the end of 2020, the UK held 14.9 million tonnes of stocks (DUKES Table 3.7). Of this total, 12.8 million tonnes were held for emergency purposes, broadly equivalent to just over 61 days of typical consumption. These stocks have historically been held both in the UK, and overseas under contractual arrangements that allow stocks to be repatriated to the UK if necessary. At the end of 2020, just over 3.8 million tonnes were held in other EU countries, most notably in the Netherlands. However, following the demand destruction brought about in 2020, stocks held in the UK reached a ten year high of 11.1 million tonnes.

Leaving the EU has also had an impact on emergency oil reserves, notably because previously the UK was obligated to hold stocks as a Member State of the EU as well as the International Energy Agency (IEA). However, because since 1 January 2021 the UK has no longer been an EU Member State, we are now only required to meet the IEA obligation. The level obligation under the IEA accounts for the fact that the UK has significant volumes of offshore production, meaning that since January 2021 companies have been directed to hold less stock than under the EU obligation. Impacts of this on more recent data can be seen in Energy Trends Table 3.11.

Chapter 4: Natural Gas

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Key headlines

Natural gas demand was down 6.0 per cent compared to 2019, to 811 TWh, the lowest level seen since 2015 because of reduced activity across the economy during restrictions in place to curb the spread of Covid-19.

There were declines in gas demand for electricity generation, industry, and services because large parts of the economy shutdown in line with government restrictions. Demand from industry fell to a new record low.

Domestic demand for gas marginally up from 2019. Despite the warmer weather in 2020, and the warmest year since 2014, domestic demand increased because of stay-at home orders.

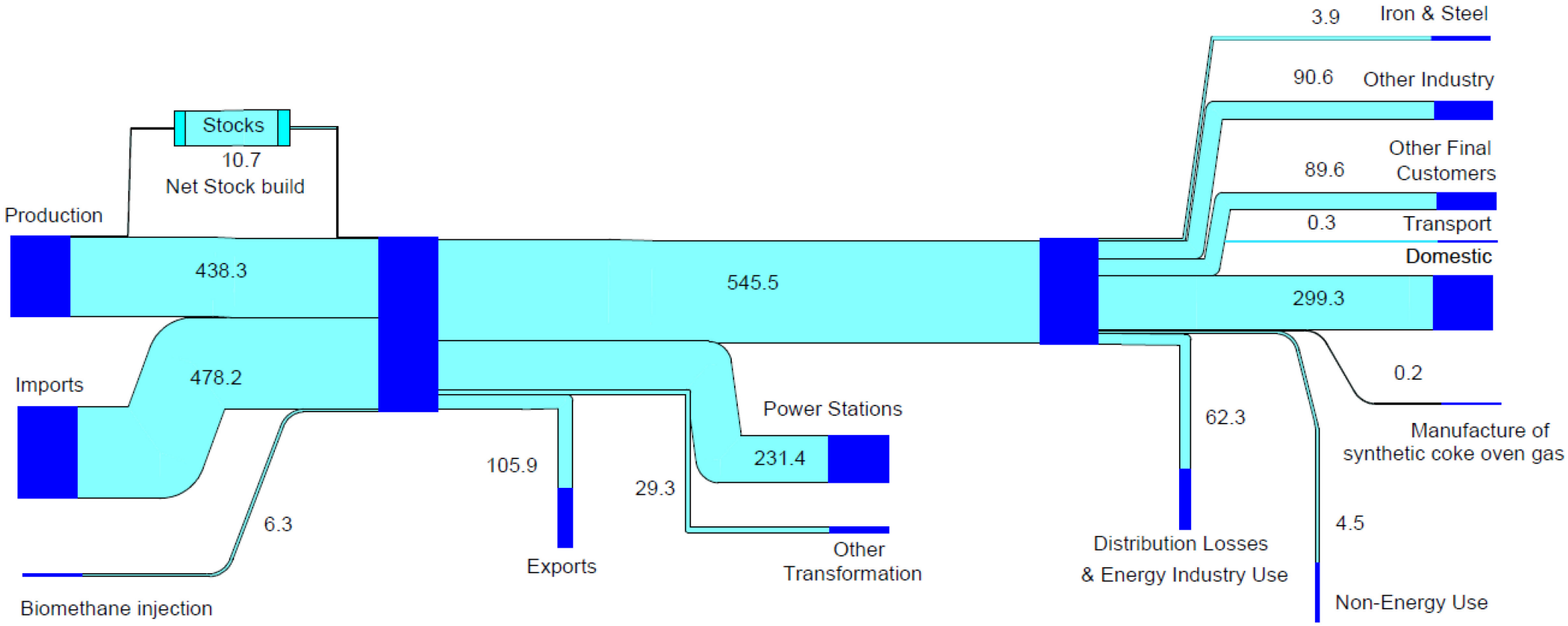
Net imports fell 12 per cent on 2019, in line with reduced demand. Despite this a growing Liquefied Natural Gas (LNG) market saw another record year for LNG imports, which reached the highest level since the peak in 2011. Global liquefaction capacity has increased consecutively for the last six years, and notably UK imports from the US were up by more than 70 per cent compared to 2019 as the US shale revolution continues to take hold.

Exports were up by almost a fifth on 2019 as the Bacton-Balgzand Line (BBL) was converted from an import pipeline to an interconnector allowing for trade in both directions. This conversion aims to support a UK oversupply in summer months as well as meet Dutch demand. As a result, there were record exports to the Netherland in 2020.

Gross gas production was stable compared to 2019 despite a challenging year for maintenance. Gas production has been broadly stable for close to a decade and the UK remains the third largest natural gas producer in Europe.

The flow chart on the following page shows the flows of natural gas from production and imports through to consumption. It illustrates the flow of gas from the point at which it becomes available from indigenous production or imports (on the left) to the final use of gas (on the right), as well as volumes transformed into other forms of energy or exported. The widths of the bands are proportional to the size of the flow they represent.

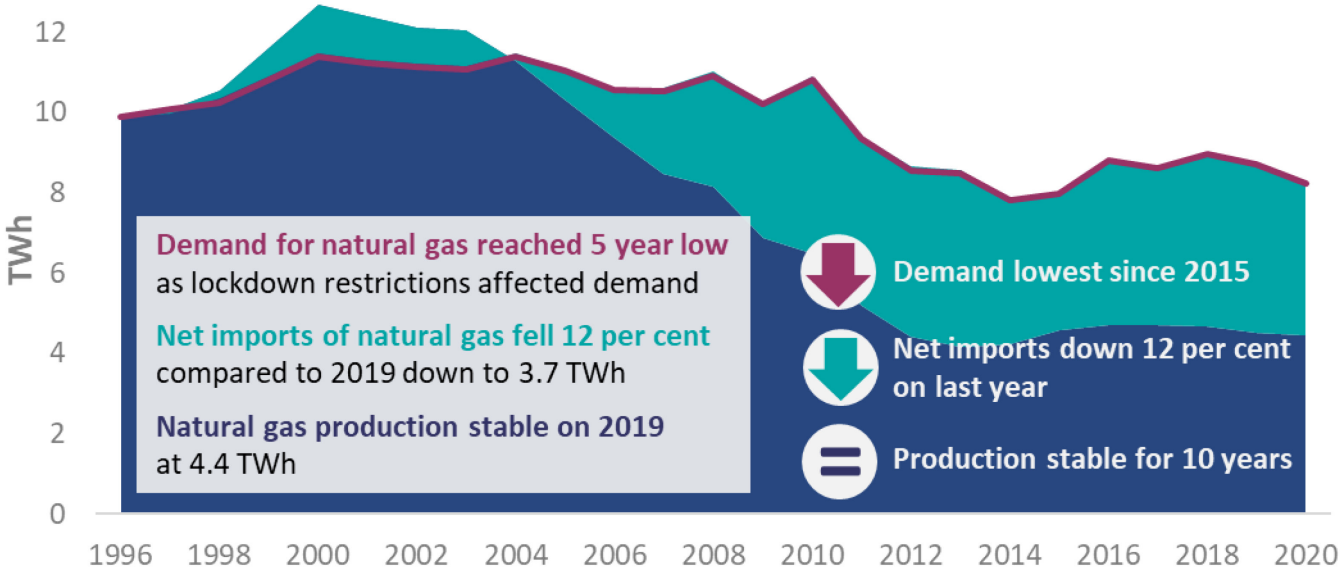
Natural gas flow chart 2020 (TWh)



Note:

This flow chart is based on data that appear in Table 4.1, excluding colliery methane.

Chart 4.1 Supply and demand for natural gas, 1996-2020 (DUKES Table 4.1)

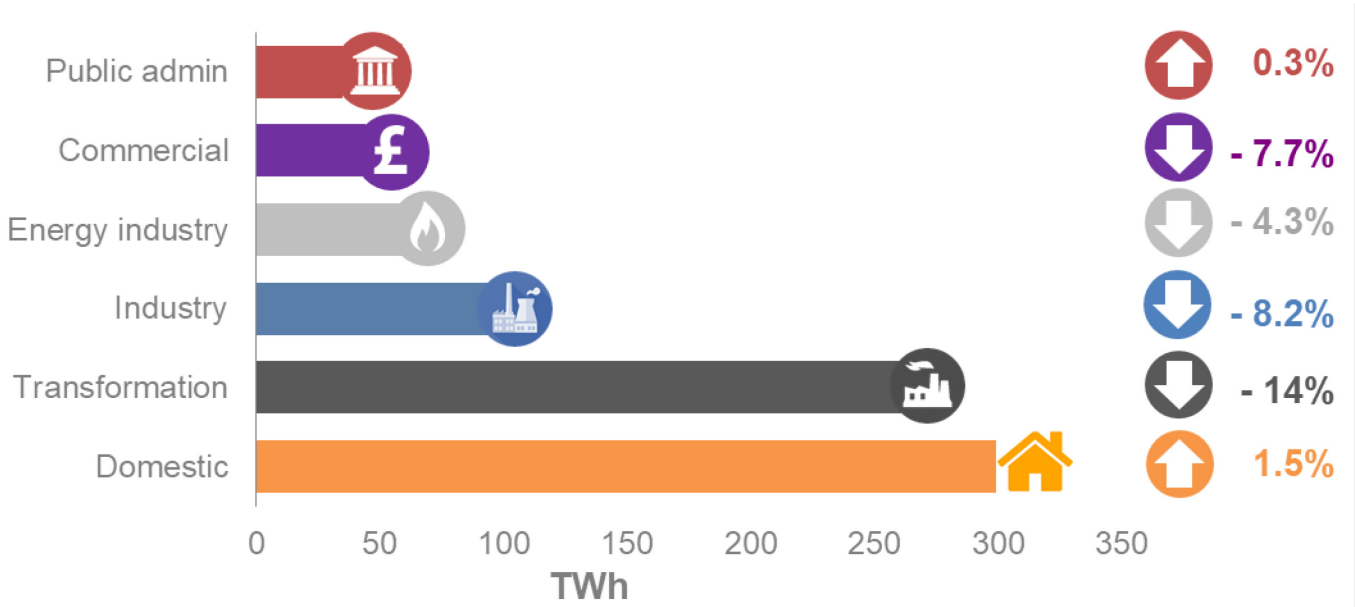


Natural gas is an important part of the UK energy mix, accounting for 30 per cent of UK energy production in 2020, and 40 per cent of demand. **UK gas demand decreased 6.0 per cent in 2020 compared to 2019**, following several years of stable demand and was largely a result of restrictions in place to curb the Covid-19 pandemic. However, trends in demand varied by sector.

In 2020, UK gross gas production was 439 TWh, stable on 2019. UK gas production has been broadly stable for close to a decade following several years of decline since the peak in 2000. Despite this the UK remains a major producer of natural gas, sitting within the top 20 gas producing countries globally and the third largest in Europe. The Oil and Gas Authority produces analysis on oil and gas reserves which can be found in the Oil and Gas reserves publication.

In 2020, indigenous production met more than half of demand with the remainder supplied via imports. Net imports fell by 12 per cent in 2020 compared to 2019 despite exports increasing 17 per cent as the Bacton to Balgzand Line (BBL) was converted to an interconnector allowing trade in both directions. Conversely imports fell to a 10-year low because demand was impacted by restrictions put in place to curb the spread of Covid-19.

Chart 4.2 Sectoral consumption of natural gas, 2019 to 2020 (DUKES Table 4.1)



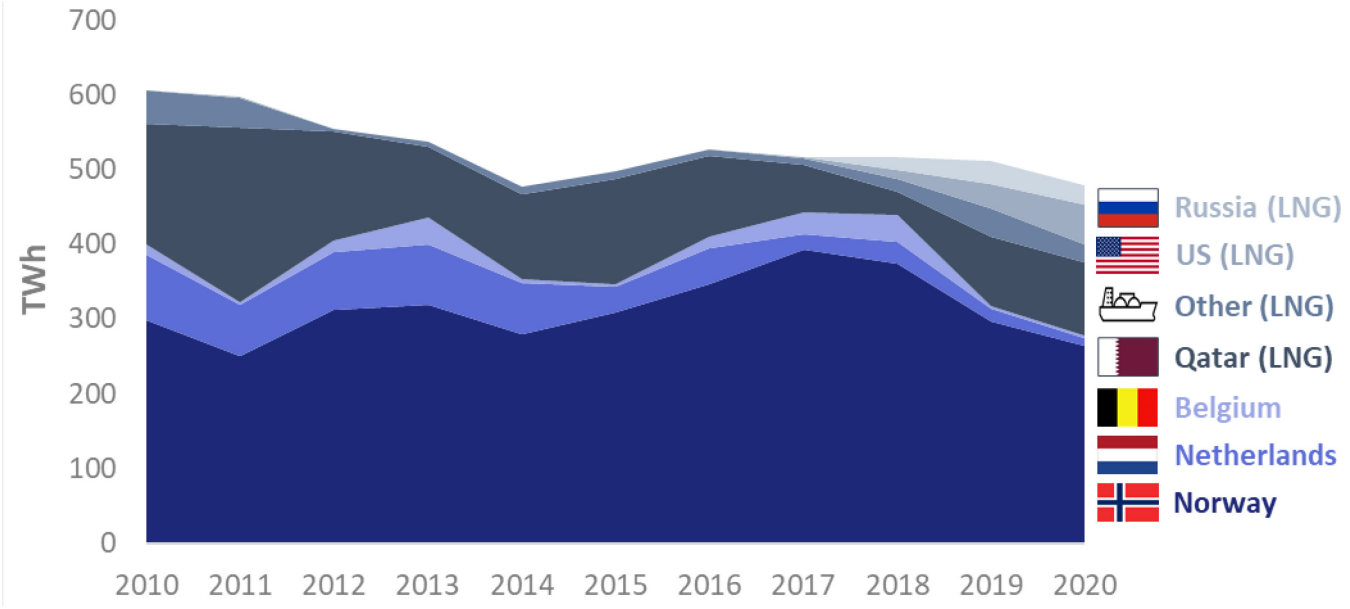
Domestic demand increased marginally, up 1.5 per cent in 2020 compared to 2019. This was despite warmer temperatures and a result of national restrictions in place to control the spread of Covid-19. Most domestic natural gas consumption is used for space and water heating as well as in appliances such as ovens and hobs. More people stayed at home changing their behaviour in line with national lockdowns and other restrictions. Overall, natural gas met two-thirds of total domestic energy demand in 2020.

In contrast, gas demand for electricity generation fell 15 per cent compared to 2019. This was due to a combination of reduced demand for electricity because of restrictions in place to curb the Covid-19 pandemic and from strong renewable generation reducing generation from fossil fuels (see Chapter 5).

Demand for gas by industry fell 8.3 per cent compared to 2019. At 95 TWh demand for gas by industry was the lowest on record in 2020 because industries slowed or ceased production in line with social distancing guidelines, particularly in the second quarter of the year, which reduced energy consumption across the sector.

Demand for natural gas by services fell 3.9 per cent in 2020 compared to 2019. Gas demand by the commercial sector was down 7.7 per cent as non-essential retail and hospitality venues were closed for large parts of the year. Conversely, gas demand by public administration was relatively stable in the face of warmer weather; despite school, university and office closures, hospitals remained open through periods of exceptional demand on their services.

Chart 4.3 Imports of natural gas, 2010-2020 (DUKES Table 4.5)

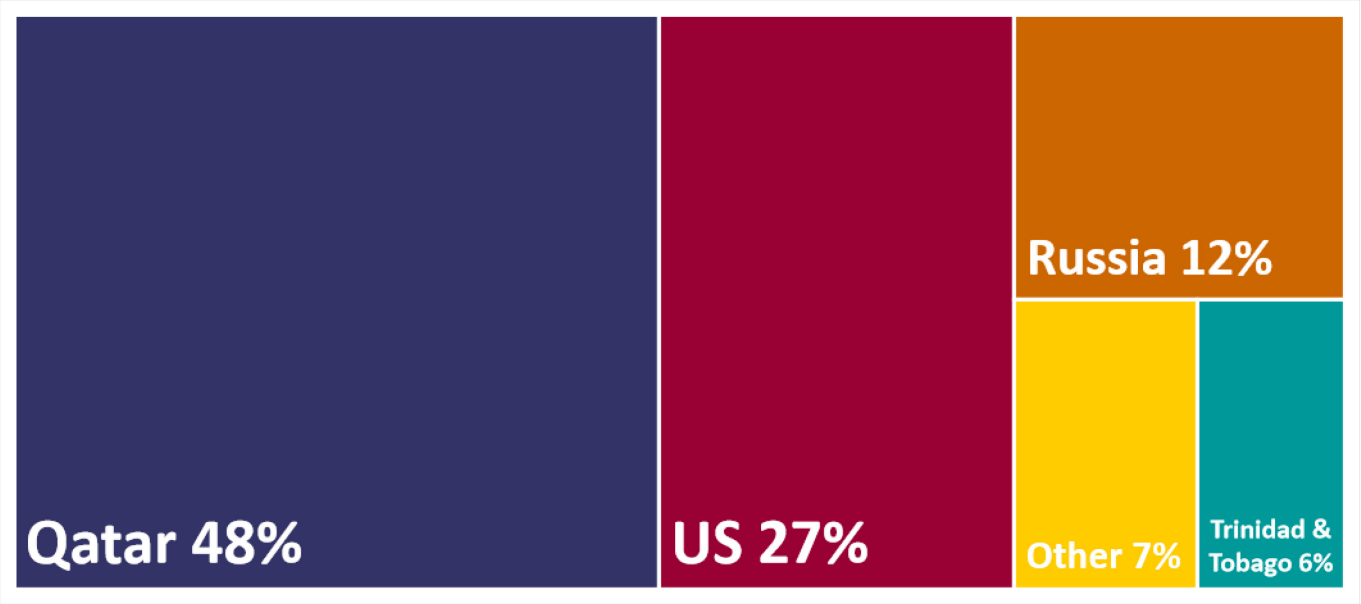


In 2020, imports were down 6.5 per cent on 2019. This was partly due to low demand. Imports arrive via pipeline; the UK imports natural gas via pipeline from Norway, Belgium and the Netherlands, or as liquefied natural gas (LNG) via ship.

Pipeline imports from Norway accounted for a third of total supply, the second largest source of natural gas following indigenous production. Imports of natural gas from Norway account for more than half of total imports. This is largely because of the UK's proximity to Norway and shared infrastructure in the North Sea. However, whilst substantial, imports of natural gas from Norway were down 11 per cent in 2020 compared to 2019 as imports of LNG displaced Norway's share to some extent.

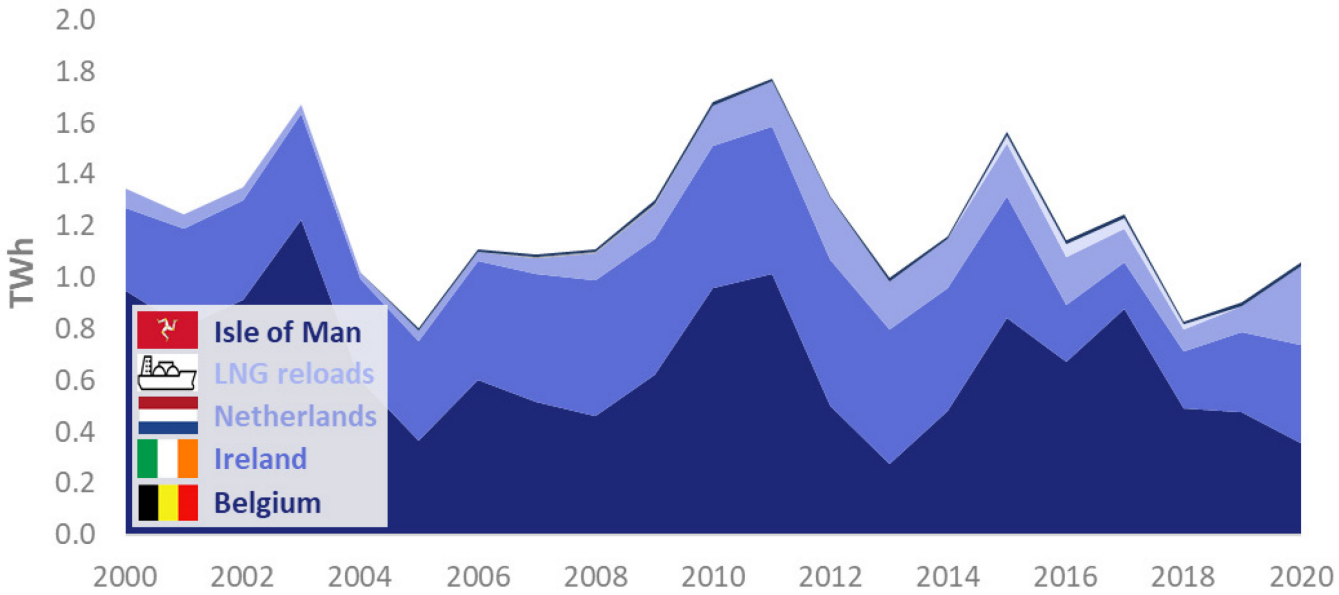
Imports of LNG increased again reaching near record highs. Despite low demand in 2020 market changes meant imports of LNG remained substantial. This follows record growth in 2019 when imports of LNG more than doubled as the UK played an important role in balancing an oversupplied market. Growth in 2020 was muted, up 2.9 per cent compared to 2019, because of substantial levels of gas in European storage followed by restrictions in response to the Covid-19 pandemic. For more information on the supply of LNG see the special feature article.

Chart 4.4 UK LNG import sources by volume, 2020 (DUKES Table 4.5)



LNG import sources have diversified, so improving UK security of supply. Historically, a large proportion of LNG imports have come from Qatar and this accounted for just under half of total LNG imports in 2020, compared to 98 per cent when they peaked in 2011. The UK imported LNG from a further nine sources; notably imports from the US increased by 72 per cent in 2020 compared to 2019. Increased import sources are attributable to growing global LNG liquefication capacity and a rapidly growing commodity market.

Chart 4.5 Exports of natural gas, 2000-2020 (DUKES Table 4.5)



*Minimal exports to Norway have been excluded from this chart.

Exports increased by almost a fifth in 2020 compared to 2019, largely due to record exports to the Netherlands following the conversion of the Bacton-Balgzand Line (BBL) from an import pipeline to an interconnector in 2019, allowing trade in either direction and with substantial exports beginning in spring 2020. This aims to manage UK oversupply in summer months following the closure of storage facilities and will also support Dutch security of supply as production at Groningen gas field, the largest in Europe, will halt in 2022.

Exports to the Republic of Ireland continue to grow, up 22 per cent in 2020 compared to 2019. This follows declining production at the Corrib gas field which accounts for most Irish indigenous production. Increasing exports to the Netherlands and Republic of Ireland outstrip a decline in exports to Belgium. Exports to Belgium continue to fall, down a quarter in 2020 compared to 2019, the second lowest level recorded. This decline is due to the termination of the Bacton-Zeebrugge interconnector contract.

Chapter 5: Electricity

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Key headlines

Electricity demand reached a record low in 2020 of 330.0 TWh, down 4.6 per cent compared to 2019. Though electricity demand has been declining year on year since 2015, the larger reduction seen in 2020 was primarily a result of the response to the Covid-19 pandemic.

Restrictions in response to Covid-19 led to decreased industrial and commercial electricity consumption, but higher domestic consumption. Industrial use of electricity, including iron and steel, was down 9.3 per cent in 2020 compared to 2019, and consumption by other final users, including the commercial sector, decreased by 11.2 per cent. Conversely, domestic consumption increased by 3.9 per cent in 2020, in comparison with 2019.

Renewable technologies generated more electricity than fossil fuels in 2020 for the first time in the published time series. Renewable sources generated 134.6 TWh in 2020, a 12.6 per cent increase compared to 2019 and higher than the 117.8 TWh from fossil fuel. This was in the context of electricity generation falling to record low levels in 2020, with total electricity generation in 2020 of 312.0 TWh. This reflects the lower demand for electricity during 2020 as a result of the UK's Covid-19 restrictions. In 2020, 43.1 per cent of UK generation came from renewables.

Fossil fuel generation was at a record low in 2020. Low demand for electricity and high generation from renewable sources reduced the need for generation from fossil fuels. Gas continued to be the dominant fuel, but generation was down 16 per cent compared to 2019. Nuclear electricity generation was down 11 per cent due to a series of statutory and unplanned outages at the UK's nuclear plants over the year. In 2020, 37.7 per cent of UK generation came from fossil fuels.

The total fuel used for electricity generation decreased substantially in 2020 down 5.2 per cent to 55.6 Million Tonnes of Oil Equivalent (Mtoe). Fuel use has fallen year on year since 2013 due to decreasing demand for electricity and growth in non-thermal renewables, but the larger decrease in 2020 was because of the unusually low demand and generation as a result of the Covid-19 restrictions.

Net imports in 2020 were 17.9 TWh, the lowest level since 2017. Net imports were 5.4 per cent of electricity supplied in 2020.

Total generation capacity decreased in 2020 to 75.8 GW, a 2.7 per cent decrease on the 77.9 GW capacity in 2019. While there were increases in renewable capacity, in particular off-shore wind, this was offset by the closure of coal power station Fiddler’s Ferry and nuclear station Dungeness B.

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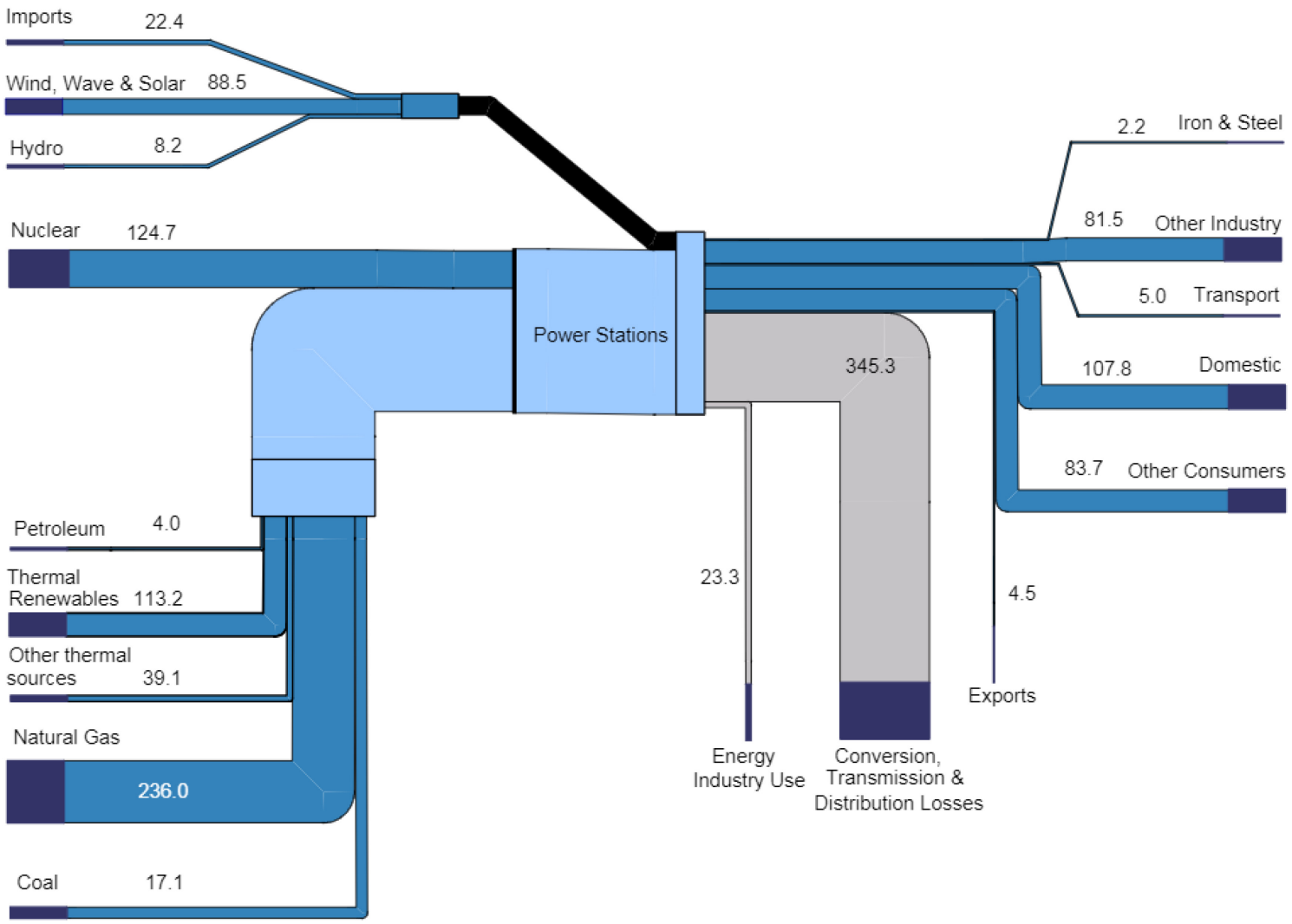
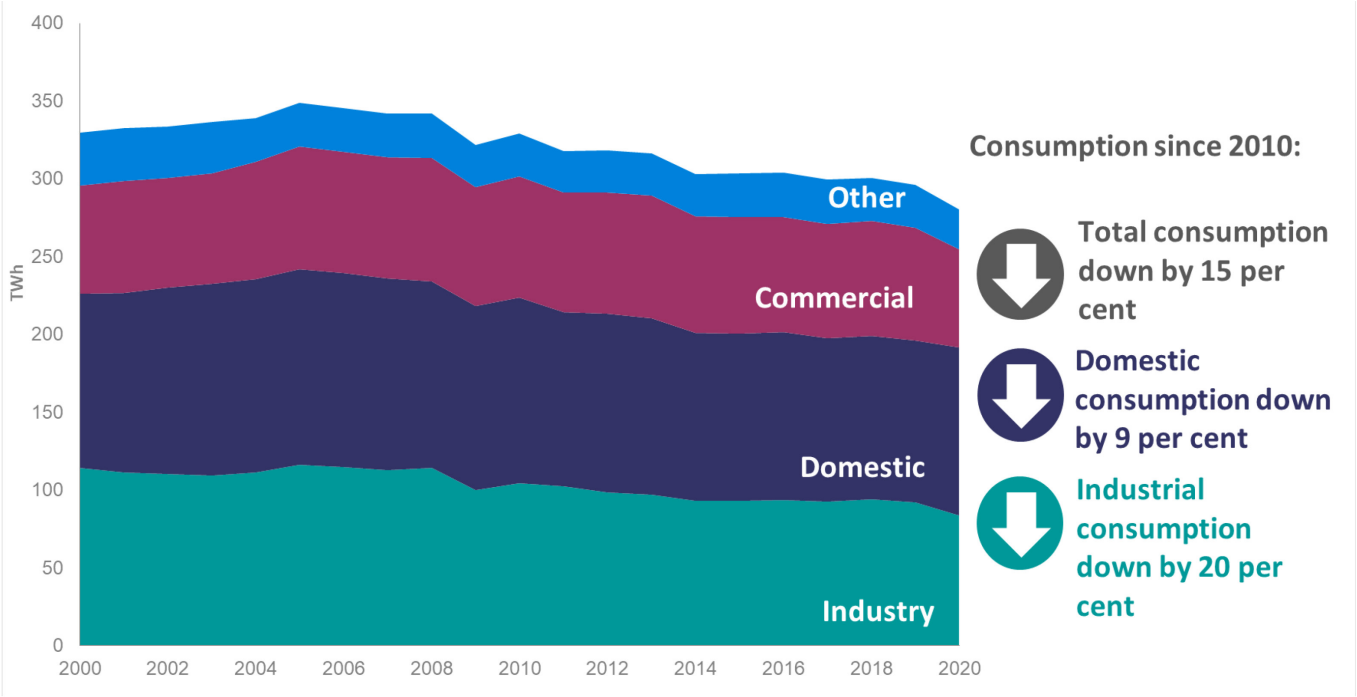
Electricity flow chart 2020 (TWh)



This flow chart is based on the data in Tables 5.1 (for imports, exports, use, losses and consumption) and 5.6 (fuel used).
1. Hydro includes generation from pumped storage while electricity used in pumping is included under Energy Industry Use.
2. Conversion, Transmission and Distribution Losses are calculated as fuel used (Table 5.6) minus generation (Table 5.6) plus losses (Table 5.1).

Electricity demand reached a record low in 2020 of 330.0 TWh, down 4.6 per cent compared to 2019. Though electricity demand has been declining year on year since 2015, the larger reduction seen in 2020 was primarily a result of the response to the Covid-19 pandemic, which restricted the activity of business and industry from March. Similarly, there was a 5.3 per cent fall in levels of final consumption of electricity compared to 2019. 'Final consumption' refers to electricity consumption by end users, excluding electricity consumed in the process of generation and transmission or distribution losses.

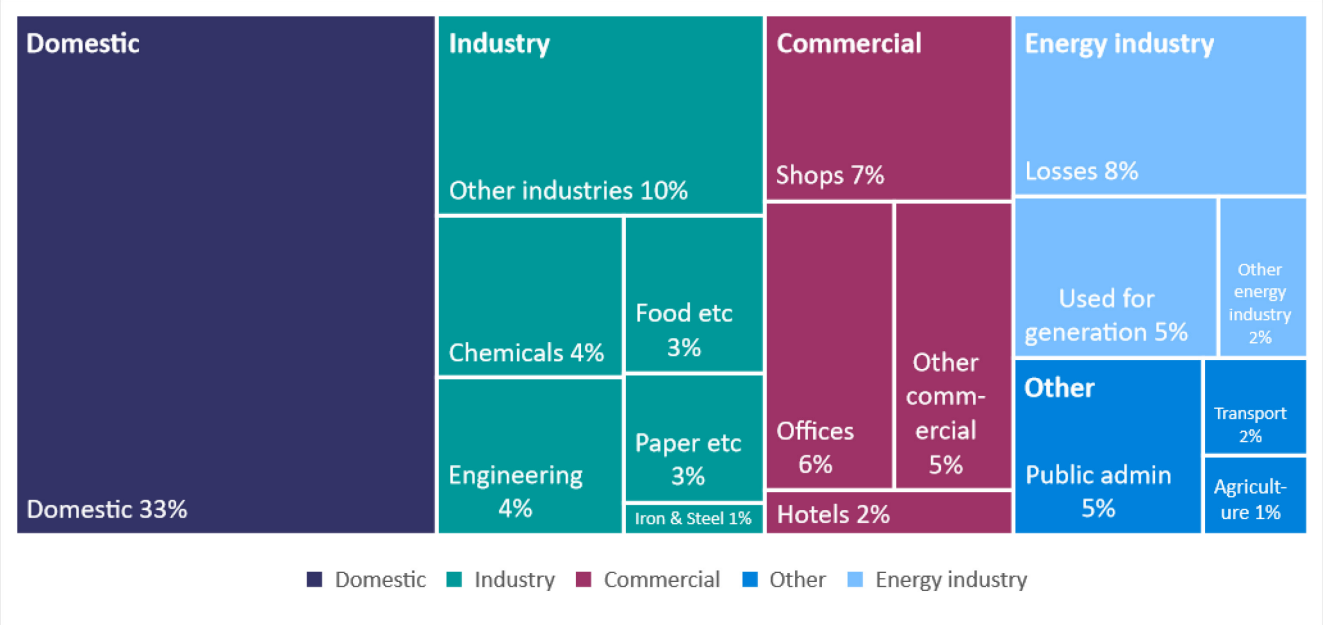
Chart 5.1 Electricity consumption by sector, 2000-2020 (Table 5.1)



Restrictions in response to Covid-19 led to decreased industrial and commercial electricity consumption, but higher domestic consumption. Industrial use of electricity, including iron and steel, was down 9.3 per cent in 2020 compared to 2019, and consumption by other final users, including the commercial sector, decreased by 11.2 per cent. This was due to restrictions placed on the activity of business and industry in response to the Covid-19 pandemic. Conversely, domestic consumption increased by 3.9 per cent in 2020, in comparison with 2019. This reflects the increase in time spent at home, including working from home, raising domestic consumption. This increase is despite higher average temperatures in 2020 than in 2019, which would usually be expected to reduce domestic electricity demand for heating.

Total electricity demand is larger than electricity consumption. This is because total demand also accounts for electricity consumed in the process of generation or to produce fuel for generation, as well as for electricity lost in transmission or distribution from where it is generated to where it is consumed.

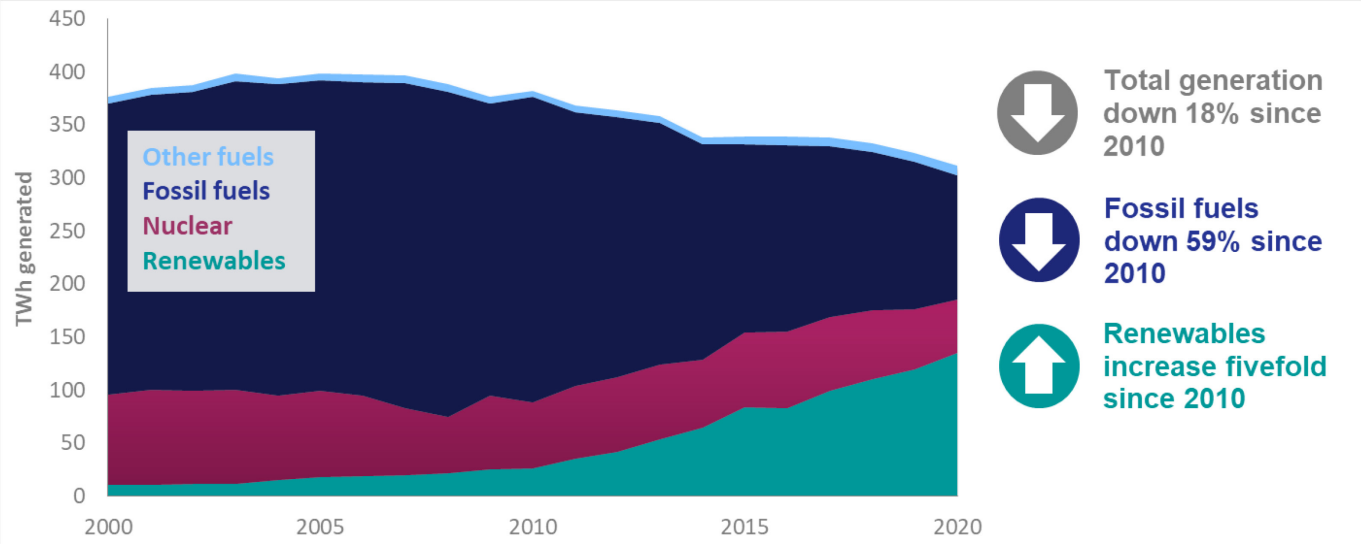
Chart 5.2 Share of total electricity demand split by sector, 2020 (Table 5.2)



Domestic users accounted for almost a third (32.7 per cent) of total electricity demand in 2020, higher than the share in 2019 (30.0 per cent). Consumption by industry represented 25 per cent and commercial consumption represented 19 per cent. Compared to 2019, the domestic share increased by 2.7 percentage points, whereas the industrial share decreased 1.3 percentage points and the commercial share by 1.7 percentage points, in line with the effects of Covid-19 restrictions in 2020.

Electricity generation and supply fell in 2020, due to reduced demand for electricity. Demand for electricity is mainly met by UK generation and supplemented with imports from Europe. Electricity generation measures what is generated while electricity supply measures what was supplied to the grid, excluding the electricity used in the process of generation. Total electricity supplied plus imports needs to match with demand to ensure there is always enough electricity available. Total electricity supplied in 2020 was 329.9 TWh, with net imports of 17.9 TWh, 5.4 per cent of electricity supplied.

Chart 5.3 Electricity generation by fuel, 2000-2020 (Table 5.6)



Electricity generation fell to record low levels in 2020, with total electricity generation in 2020 of 312.0 TWh, 3.6 per cent less than in 2019. This reflects lower demand for electricity during 2020 as a result of the UK's Covid-19 restrictions. 2020 also continued the shift away from generation by Major Power Producers (MPPs), which was down 5.1 per cent to 253.9 TWh, partly offset by a 3.8 per cent increase in generation from autogenerators and other generators to 56.7 TWh. The generation by MPPs was the lowest value on the published data series, partly due to the lower demand but also the ongoing trend towards smaller renewable sites.

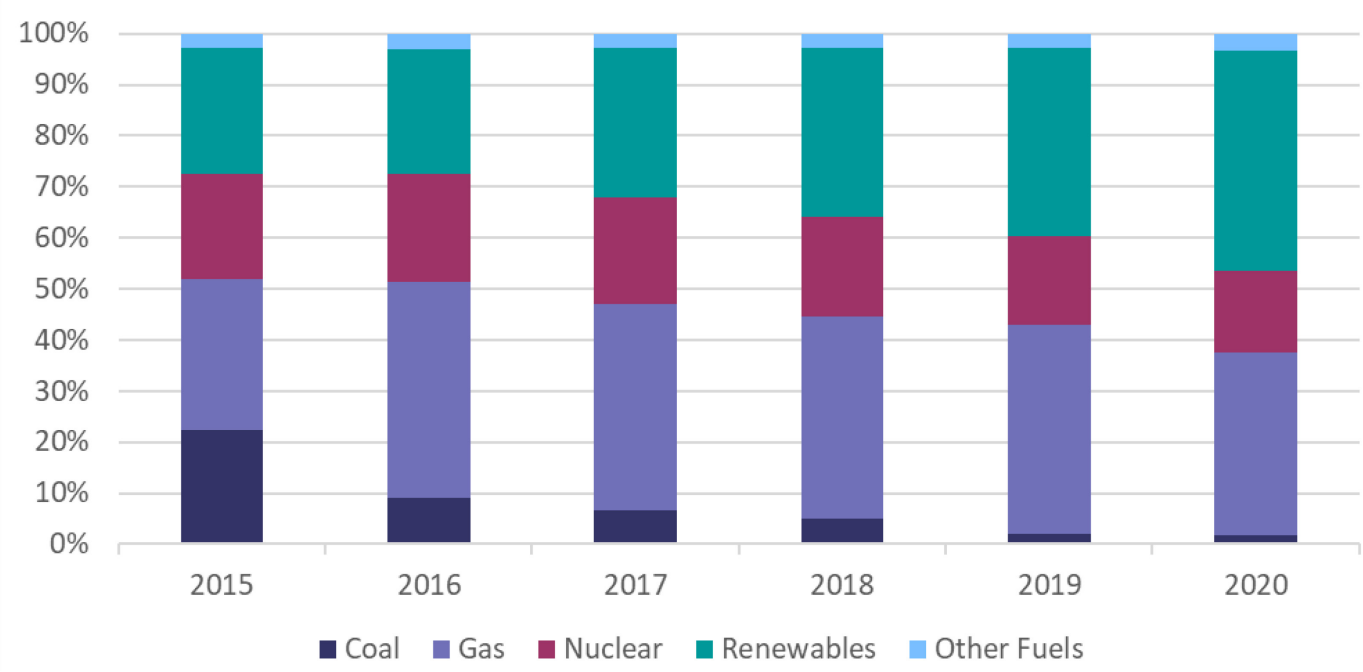
Generation from renewable sources in 2020 was higher than fossil fuels for the first time in the published time series. Renewable sources generated 134.6 TWh in 2020, a 12.6 per cent increase compared to 2019 and higher than the 117.8 TWh from fossil fuel. The high renewable generation was driven by increased wind generation, up by 18 per cent compared to 2019 to 75.4 TWh. This reflected favourable conditions for generation and increased capacity, particularly for offshore wind, which generated 27 per cent more electricity in 2020 than in 2019. In particular, the East Anglia One offshore wind farm became fully operational in 2020, adding 0.7 GW to the UK's offshore wind capacity. Weather conditions were also favourable for hydro generators, which saw a 15.5 per cent increase compared to 2019, to 6.8 TWh. There was also a 5.4 per cent increase in generation from bioenergy, in line with increased capacity.

Fossil fuel generation was at a record low in 2020, down 15.9 per cent to 117.8 TWh. This came as low demand for electricity and high renewables generation reduced the need for generation from fossil fuels. Gas continued to be the dominant fuel, generating 111.4 TWh in 2020 but this was down 16 per cent compared to 2019. During 2020 there were several substantial periods with no coal-fired generation in Great Britain, including a record 67 day period between April and June 2020. Northern Ireland operates on a separate electricity network where some coal generation continued. Just four coal-fired power stations remain in the UK, following the closure of Fiddlers Ferry and Aberthaw B in March 2020, with plans to phase these out by 2025.

Nuclear electricity generation was 50.3 TWh in 2020, down 11 per cent compared to the previous year. This was the lowest amount in more than twenty years as all of the UK's nuclear plants were on outage at times during the year. While some of these were statutory outages (planned in advance for maintenance purposes), there were also a number of unplanned outages for repairs, including Dungeness B being unable to generate all year. This also included Sizewell B operating at half capacity from May to September at the request of National Grid because of the lower demand for electricity.

As well as absolute generation, it is also useful to consider the overall shares of generation, which are less affected by changes in demand. This is particularly important for 2020, which saw unusual demand patterns as a result of Covid-19 restrictions.

Chart 5.4 Shares of electricity generation by fuel, 2015-2020 (Table 5.6)



In 2020, the proportion of electricity generation coming from renewable sources exceeded that of fossil fuels for the first time in the published data series. The renewable share rose sharply in 2020, to 43.1 per cent of UK generation, an increase of 6.2 percentage points compared to 2019. This was substantially higher than the share of generation from fossil fuels (37.7 per cent) for the first time in the published data series. All the renewable technologies including bioenergy saw increases in generation shares

in 2020, with the largest being a 3.7 percentage point increase in wind generation share. Wind provided 24 per cent of the total generation in 2020. The share of generation from low carbon sources increased again in 2020 to 59.3 per cent, up 5.0 percentage points compared to 2019, because of the high share of generation from renewables.

The fossil fuel share of generation was the lowest on the published data series, down by 5.5 percentage points to 37.7 per cent. Gas continues to be the dominant fuel in the UK generation mix, generating 35.7 per cent of the total in 2020, although this was down 5.0 percentage points on 2019. 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 1.8 per cent in 2020.

Nuclear share of electricity generation fell to its lowest level since 2010, accounting for 16.1 per cent of generation in 2020, down 1.2 percentage points on 2019.

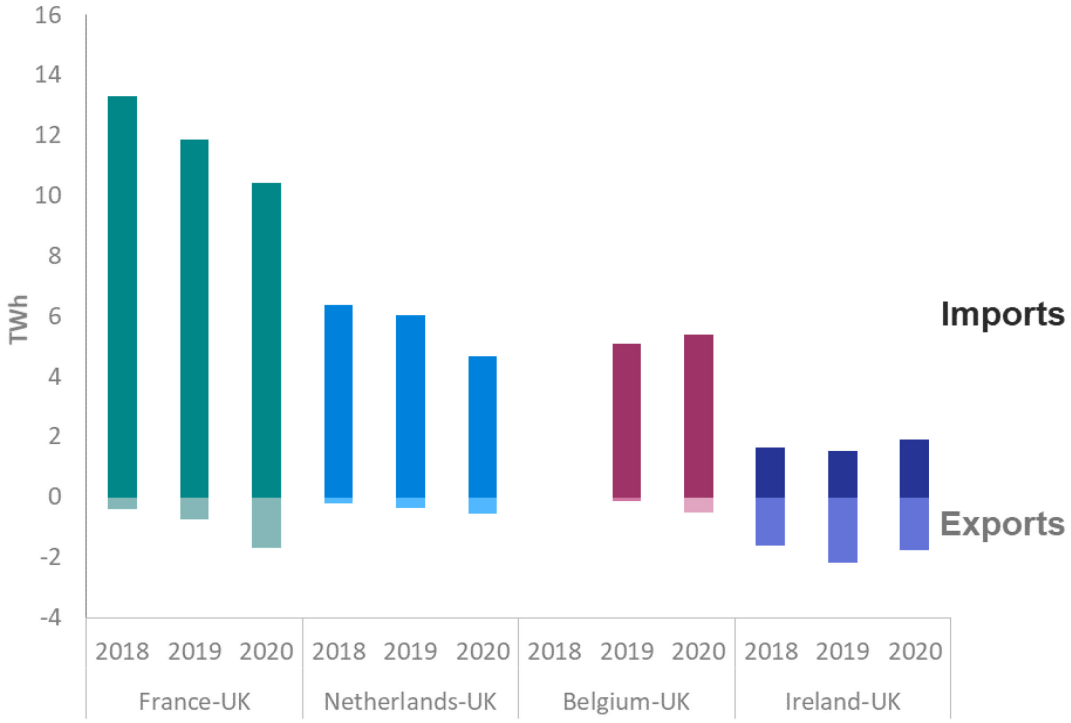
The total fuel used for electricity generation decreased substantially in 2020, down 5.2 per cent to 55.6 Million Tonnes of Oil Equivalent (Mtoe). This was the lowest value on the published data series with fuel use falling year on year since 2012. In the last ten years, total fuel use has fallen 28 per cent due to decreasing demand for electricity and growth in non-thermal renewables which do not incur conversion losses[3]. The larger decrease in 2020 compared to 2019 was because of the unusually low demand and generation as a result of the Covid-19 restrictions.

Trends in fuel used mirror those in electricity generation, with record low amounts of fossil fuel used, record low use of nuclear fuel and record highs for fuel used by renewable generators. Gas continues to dominate the UK generation mix, with 20.3 Mtoe used in 2020, while coal use has continued to decline with just 1.47 Mtoe used in 2020. This was a 21 per cent reduction on 2019 and 94 per cent lower than 2010 levels.

The UK continued to support its own generation by importing electricity from Europe to meet demand, though total net imports were down by 15 per cent in 2020. Net imports in 2020 were 17.9 TWh, the lowest level since 2017 and represented 5.4 per cent of total electricity supplied, down 0.7 percentage points on 2019. Total imports were 22.4 TWh in 2020 (down 8.8 per cent compared to 2019) while total exports were up 32 per cent on 2019 to 4.5 TWh.

[3] For wind, hydro and solar, the fuel used is assumed the same as the electricity generated, unlike thermal generation where conversion losses are incurred. Therefore, for example, if one unit of electricity produced from coal is switched to wind, the fuel used will show a fall from around three units (as coal's thermal efficiency is around one-third) to one unit.

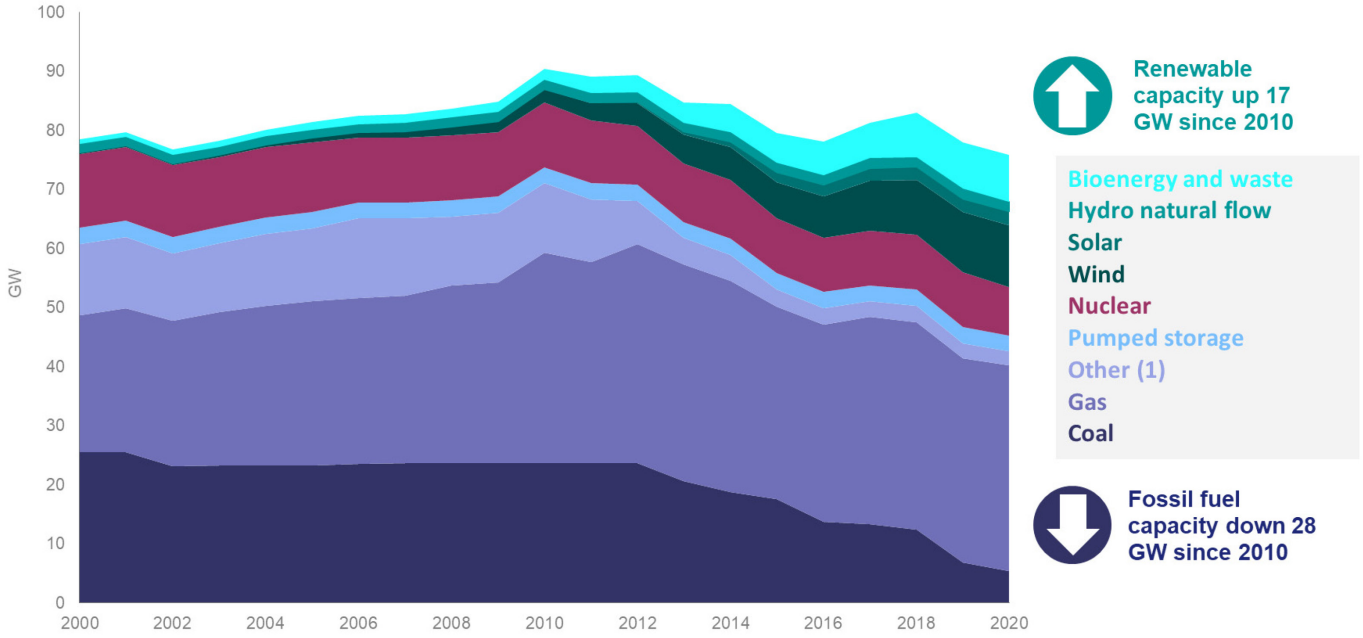
Chart 5.5 Electricity imports from Europe (Table 5.13)



Just under half of the UK's electricity imports (47 per cent) were from France, with the French IFA interconnector providing net imports of 8.7 TWh, although this was down 22 per cent on 2019. Belgium and the Netherlands also have substantial amount of net imports, 4.9 and 4.1 TWh respectively, though the lower demand in 2020 meant that both saw a decrease compared to 2019. The Northern Ireland – Ireland interconnector remains the only interconnector where exports of electricity exceed imports with net imports of –0.8 TWh in 2020.

UK electricity is generated from a range of technologies and fuels which will be used at different times in response to demand and to changes in weather. Monitoring capacity along with load factors allows us to see how the capacity is being used and monitor the security of electricity supply.

Chart 5.6 Installed capacity of UK electricity generation assets by fuel, 2000 to 2020 (Table 5.7)



Total generation capacity decreased in 2020 to 75.8 GW, a 2.7 per cent decrease on the 77.9 GW capacity in 2019. While there were increases in renewable capacity, in particular offshore wind, these were offset by the closure of two large coal power stations and nuclear station Dungeness B. These large plant closures meant that the peak demand for electricity during the winter 2020/21[4] was equivalent to 75.5 per cent of UK MPP generation capacity, up 3.2 percentage points compared to 2019. In this section, wind, small scale hydro and solar PV capacity is de-rated to account for intermittency, to enable direct comparison with conventional fuels which are less dependent on the weather.

The largest reduction in generation capacity during 2020 was seen in coal-fired generation, which fell to 5.4 GW, with the closure of Fiddlers Ferry (2.0 GW). This leaves just four coal plants operating in the UK, with plans to phase these out by 2025, and reflects the shift away from coal for electricity generation. Nuclear capacity fell by 12.1 per cent with the closure of Dungeness B[5]. Gas-fired generation capacity remained relatively stable, up by 0.6 per cent.

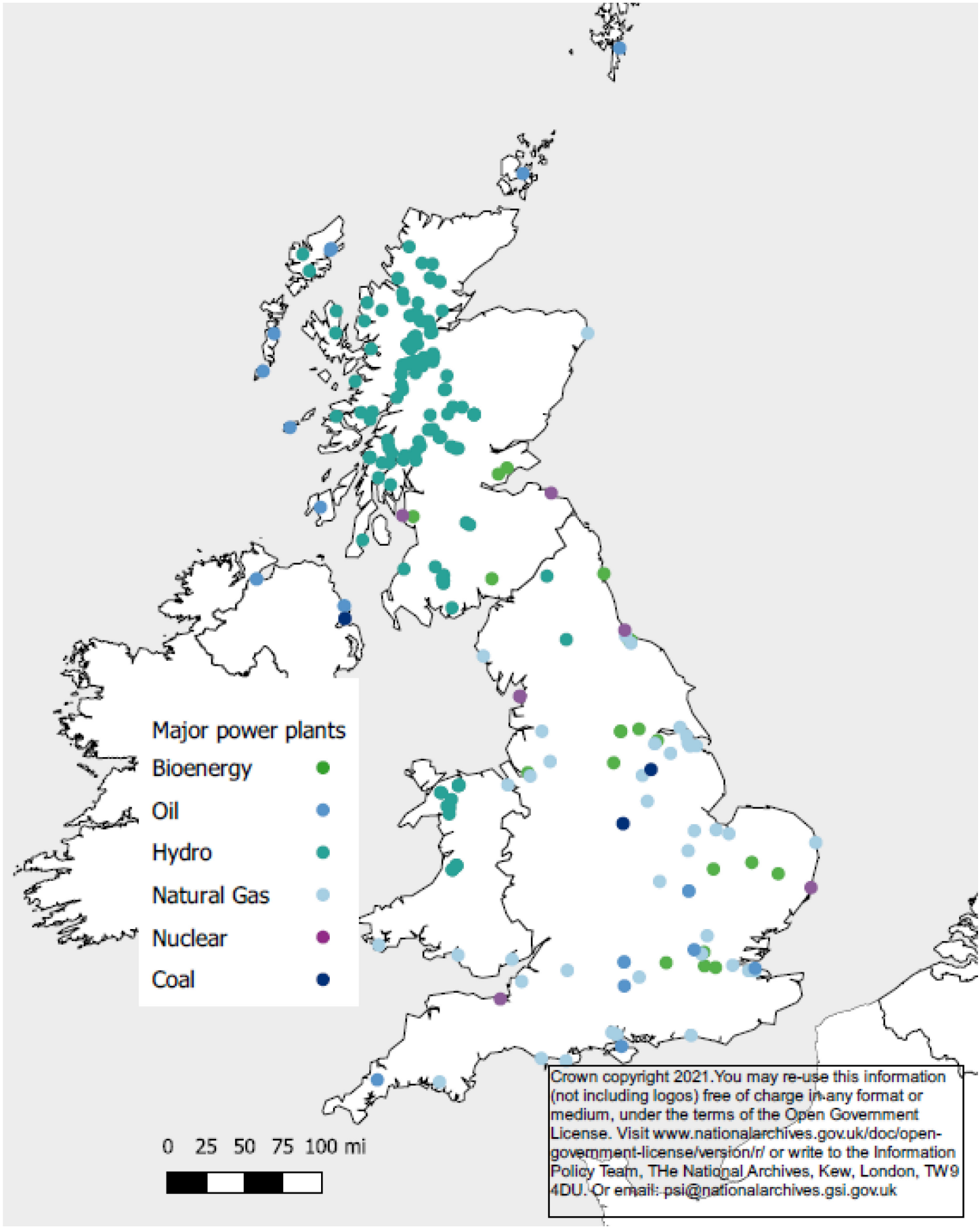
Renewable generation capacity continued to increase in 2020, with 0.4 GW of renewable capacity added to take the total to 22.4 GW. Without derating, this is an increase of 1.0 GW which brings the total installed capacity for renewable generation to 47.8 GW, as detailed in Table 6.4. Half of the additional capacity was for offshore wind generation, including the opening of East Anglia One which added 0.5 GW over the course of the year. Solar generators and municipal solid waste generation also saw additional capacity.

In addition to decreased capacity, the MPP power plants were less intensively deployed than they were last year, with a load factor of 41.6 per cent. Load factors indicate the proportion of the time the plant is producing electricity and decreased by 0.7 percentage points compared to 2019. Load factors vary by technology, with nuclear stations the highest at 59.8 per cent and the lowest being pumped storage hydro at 5.8 per cent. Full load factors for renewable generation are given in Table 6.5.

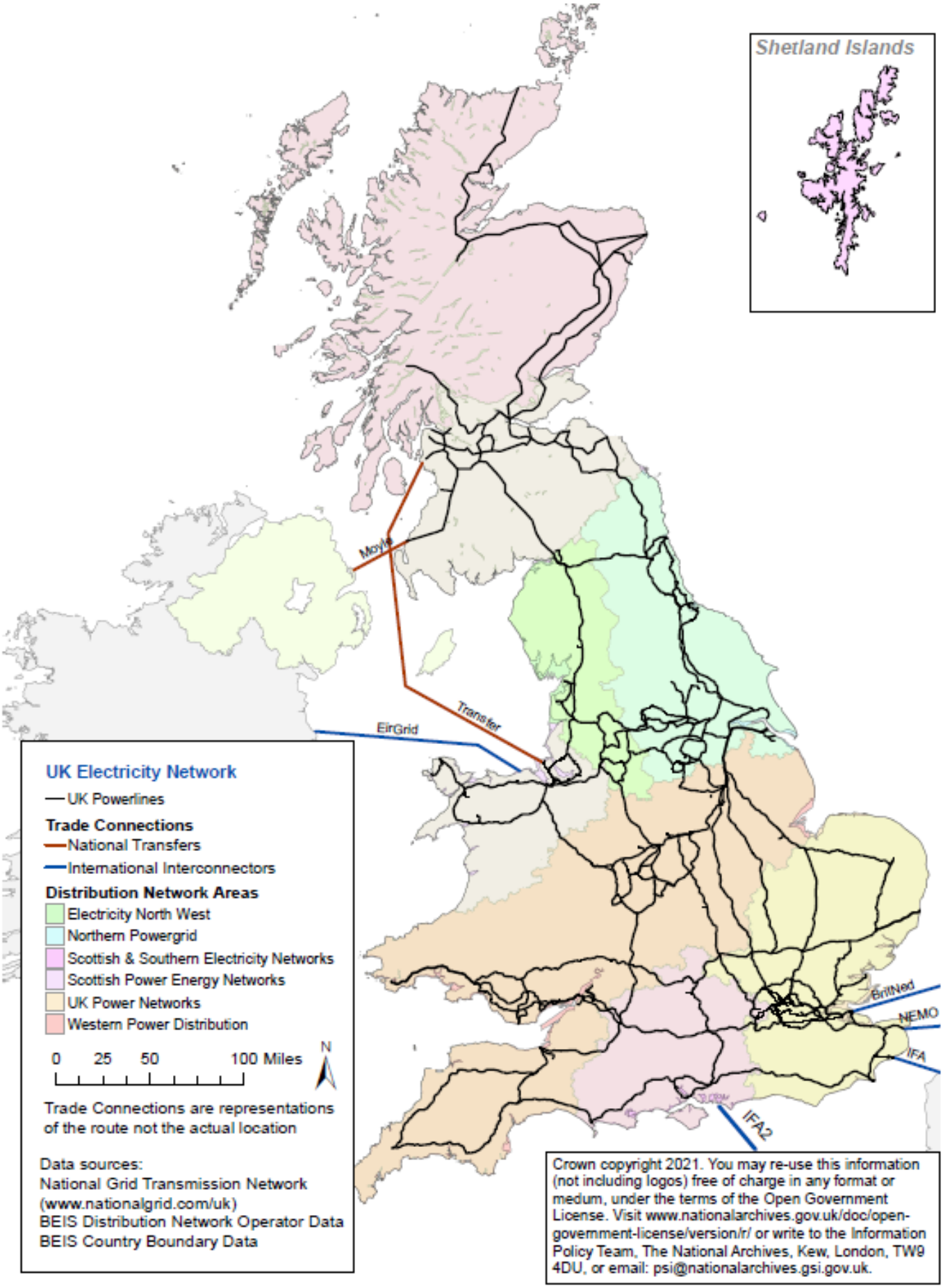
[4] 7th January 2021 in the half hour ending 17:00

[5] It was announced in June 2021 that Dungeness B would begin defueling prior to closure. It has not generated since 2018, so has been excluded from the 2020 capacity tables.

Map of Major Power Producers in the UK (operational May 2021)



UK Distribution Network Operating Areas and GB Power Lines Map



Chapter 6: Renewable sources of energy

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Key headlines

The proportion of renewable generation outstripped fossil fuels for the first time in 2020 as a result record renewable generation. Renewable electricity now represents 43.1 per cent of total generation, up from 36.9 per cent in 2019.

Growth in new renewable capacity continued to slow with just 1.0 GW added in 2020, the lowest since 2007. Covid-19 restrictions are likely to have contributed to the slowdown in growth in 2020 but at just 2.1 per cent, this is the slowest growth rate since 2002.

Renewable generation increased by 15.1 TWh (13 per cent), 11.6 TWh of which can be attributed to wind generation (2.9 TWh onshore, and 8.7 TWh offshore). Despite the modest increase in capacity, favourable weather conditions (notably the exceptionally high wind speeds during storms Ciara and Dennis in the first quarter of 2020) contributed to the increase in wind generation.

Total renewable fuel use increased by 1.6 mtoe (6.8 per cent); as renewable fuel use continues to be dominated by those used for electricity generation (74 per cent), almost two thirds of the increase can be attributed to the increase in wind generation. **Renewable heat increased by 0.3 mtoe (6.3 per cent) and grid injected biogas increased by 9.0 per cent, though from a relatively low base (0.5 mote).**

The renewable energy flow chart overleaf summarises the flows of renewables from fuel inputs through to consumption for 2019 and includes energy lost in conversion. The data are sourced from the commodity balance Table 6.1 and Table 6.4 for electricity outputs.

It also shows net imports for those renewable fuels which are transportable; utilising natural resources such as wind, solar and hydro are localised in nature resulting in a high proportion of domestically produced renewable sources which in 2020, represented approximately 80 per cent of renewable demand. Excluding primary generation and biogases, net imports represent around half of the demand, the majority of which is wood pellets used in electricity generation.

Renewable energy flow chart (Tables 6.1 and 6.4)

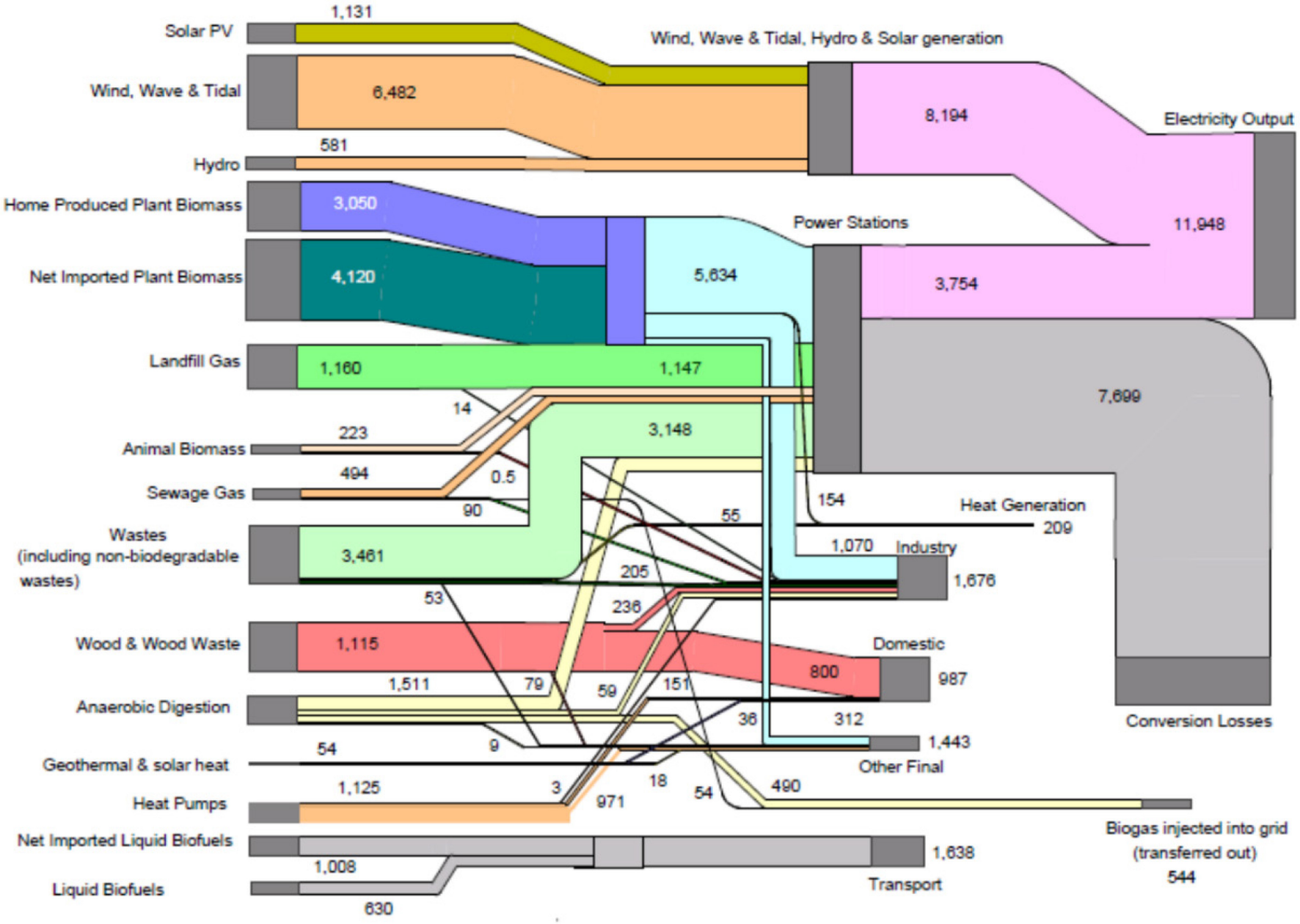
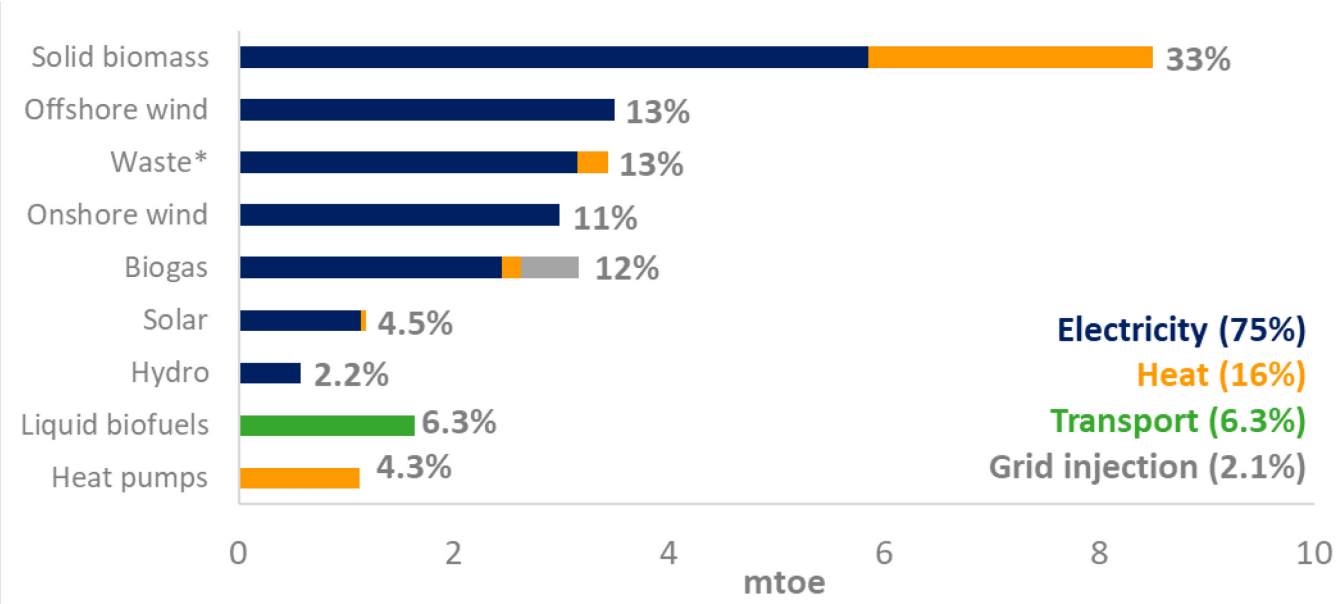


Chart 6.1 shows each of the renewable fuels and the end use of these fuels be that for electricity, heat, transport, or injection of biogas into the national grid.

Chart 6.1 Use of renewable fuels, 2020 (Table 6.6)

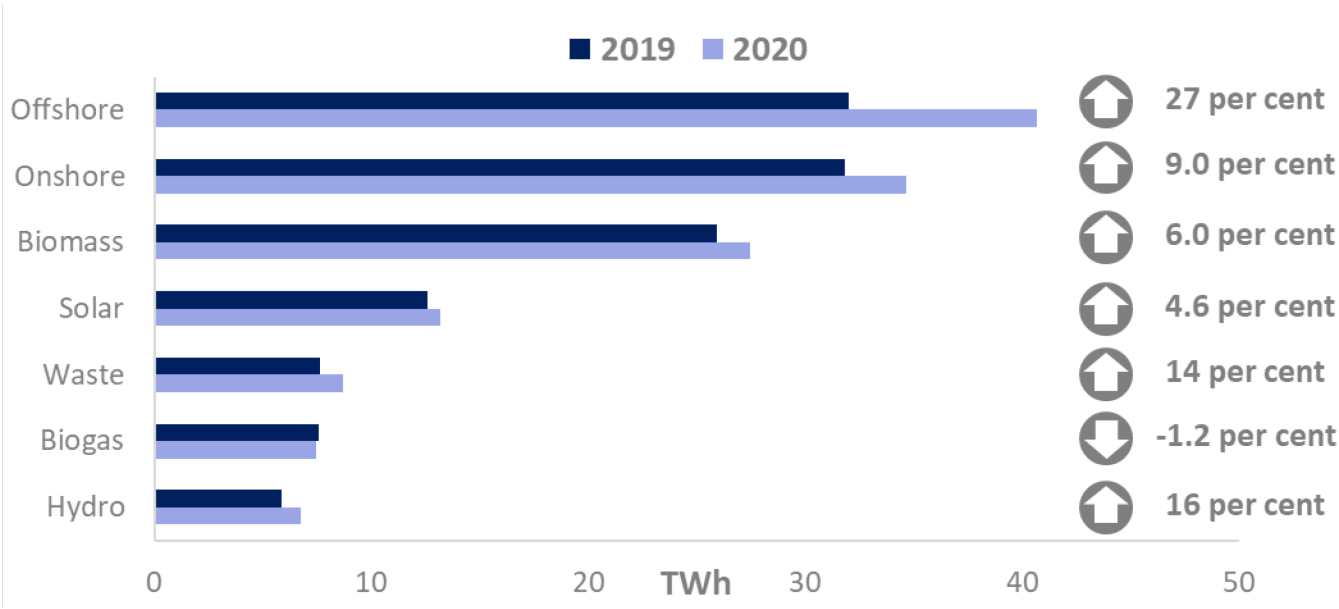


**Including non biodegradable waste*

Solid biomass, including wood, waste wood, animal and plant biomass, represented 33 per cent of total renewable demand in 2020 with approximately two thirds being used in electricity generation and the remaining third to produce heat. Biogas (landfill and sewage gas, and anaerobic digestion) has historically been used in generation and heat but has more recently been injected into the gas grid. Over three quarters, however, is still being used for electricity generation with 17 per cent being injected into the grid (up from 11 per cent in 2016, the first year data became available).

Although solid biomass accounts for the largest share of renewable fuel, on an output basis (i.e. generation after conversion losses in thermal generation), offshore and onshore wind show a higher share at 29 per cent and 25 per cent respectively in 2020. Chart 6.2 shows the change in generation between 2019 and 2020. With low-capacity growth in 2020 generally, some weather dependent renewable sources showed higher growth rates compared to thermal generation due to favourable wind speeds and rainfall.

Chart 6.2 Growth in generation by fuel 2019 – 2020 (Table 6.4)



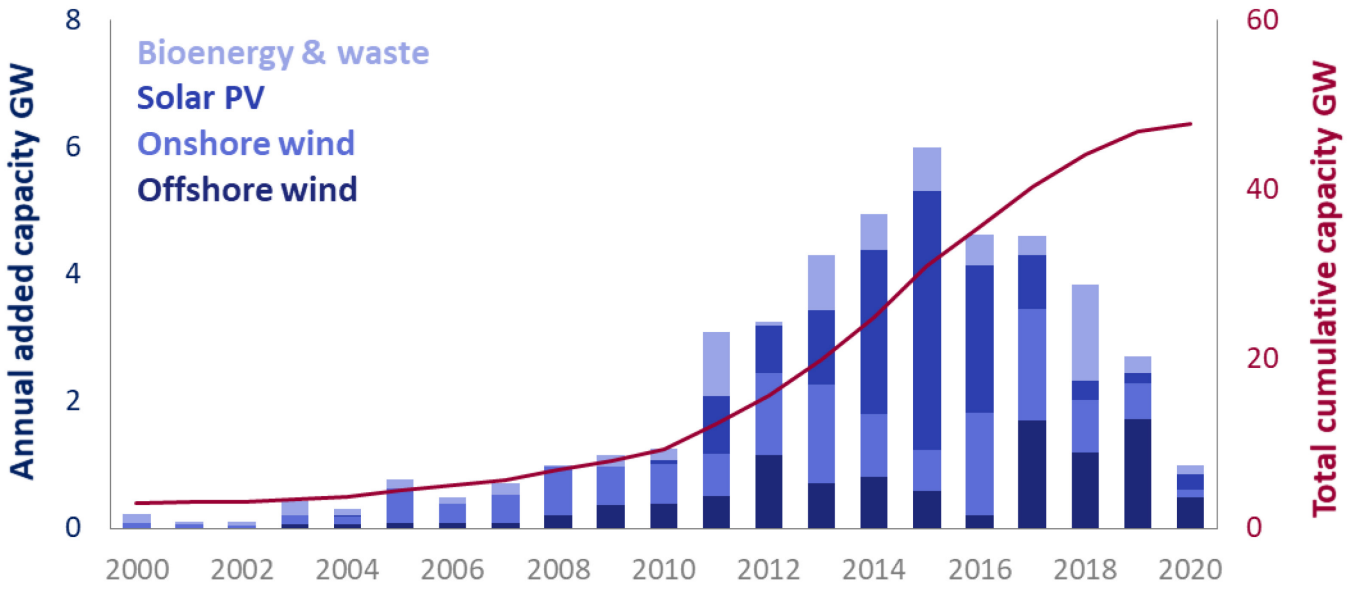
Offshore wind generation showed the highest increase in both absolute and percentage growth terms (by 8.7 TWh or 27 percent), with onshore also growing strongly (by 2.9 TWh, or 9.0 per cent). Although offshore wind did see some added capacity during 2020 (0.5 GW, or 5.0 per cent), the dominant effect on wind generation was the exceptionally high windspeeds particularly during the first quarter when Storms Ciara and Dennis hit the UK.

Generation from hydro also increased in 2020, by 0.9 TWh to 6.8 TWh, a 16 per cent rise. Installed capacity for hydro is stable and the additional growth was due to higher levels of rainfall compared to 2019. Energy from waste plants increased their capacity in 2020 which provided an additional 0.5 TWh in generation (1.1 TWh including non-biodegradable waste).

Only biogas saw a reduction in generation due to falling extraction rates at landfill gas sites, generation reached a peak in 2011 and has fallen by 34 per cent since then to 3.5 TWh.

Chart 6.3 shows the growth in new capacity over time. **New capacity reached a peak in 2015** when a total of 6.0 GW was installed, 4.1 GW of which was in solar PV. In 2020, just 1.0 GW was installed though some projects may have been deferred due to Covid-19 restrictions. Chart 6.3 shows new capacity in the year of installation by technology compared to the cumulative total capacity.

Chart 6.3 Annual added capacity 2000 to 2020 (Table 6.4)



Prior to 2011, solar PV capacity formed a very small part of the renewable energy mix representing just 1.0 per cent of total capacity. However, since then and up until 2017, it increased significantly with capacity added during those years accounting for 87 per cent of the current installed capacity. Although growth has slowed since 2017, solar PV's share of the renewable mix stands at 28 per cent in 2020. Growth in new wind sites has been more stable particularly onshore wind, though it has slowed markedly over recent years with just 0.1 GW added in 2020, an increase less than one per cent. Offshore wind has seen higher levels of new capacity in recent years with almost half being installed since 2016. Wind now represents over half total installed capacity (see wind map on next page showing location by capacity band).

Despite the slowdown in new capacity, the overall picture of increasing generation since 2000 remains positive with new records regularly being set including total generation in 2020 which at 134.6 TWh was 13 per cent higher than in 2019. Chart 6.4 shows how each technology has contributed to this strong growth.

Map of UK wind capacity 2020

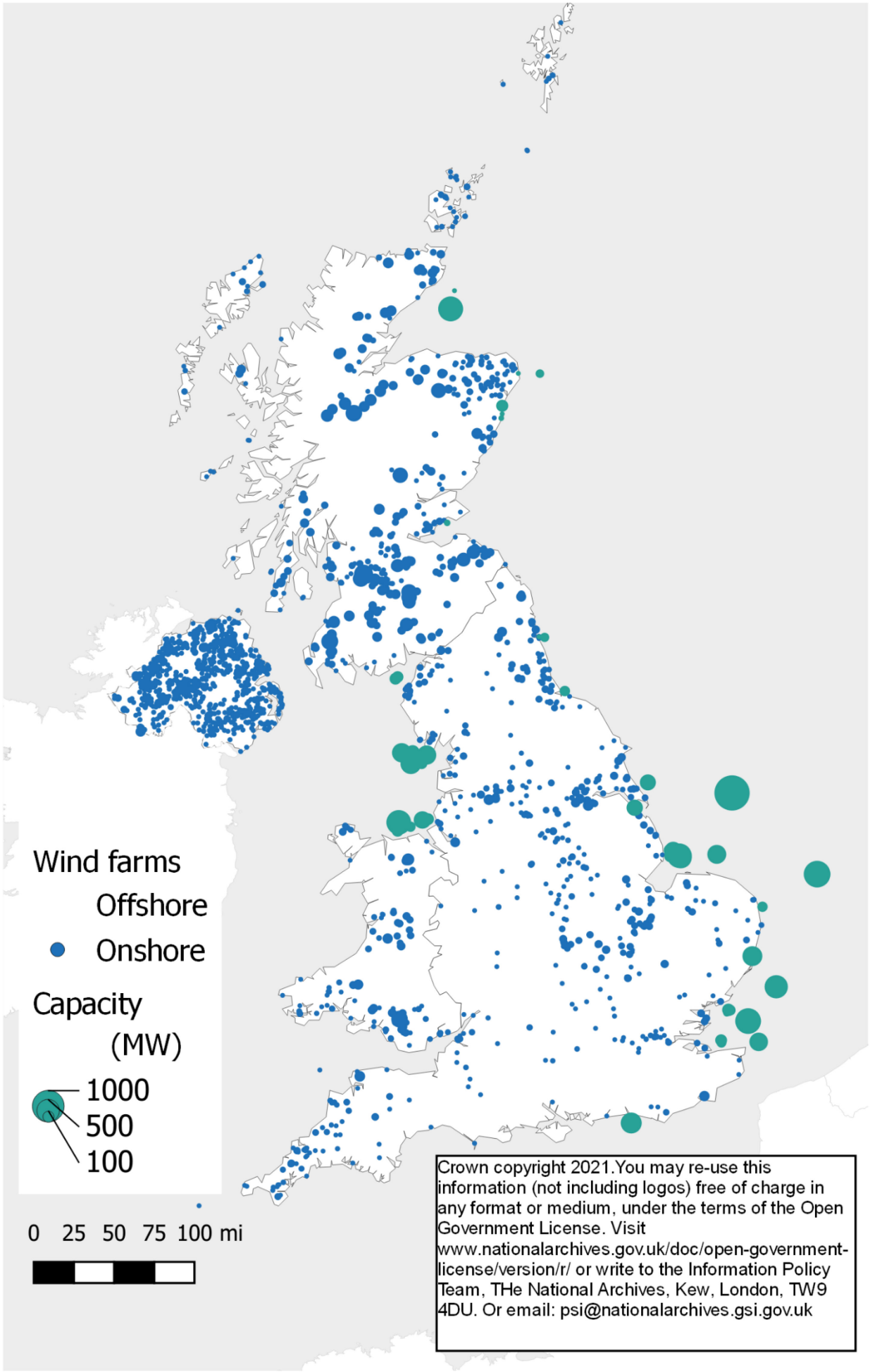
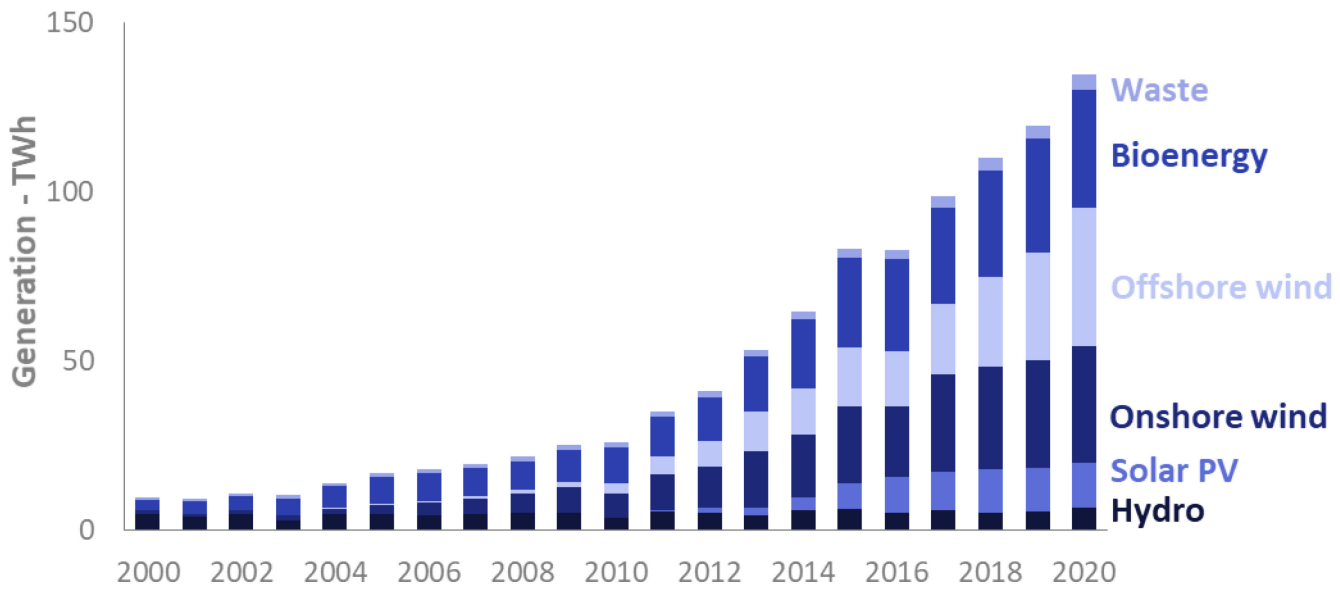


Chart 6.4 Trends in generation by technology 2000 to 2020 (Table 6.4)

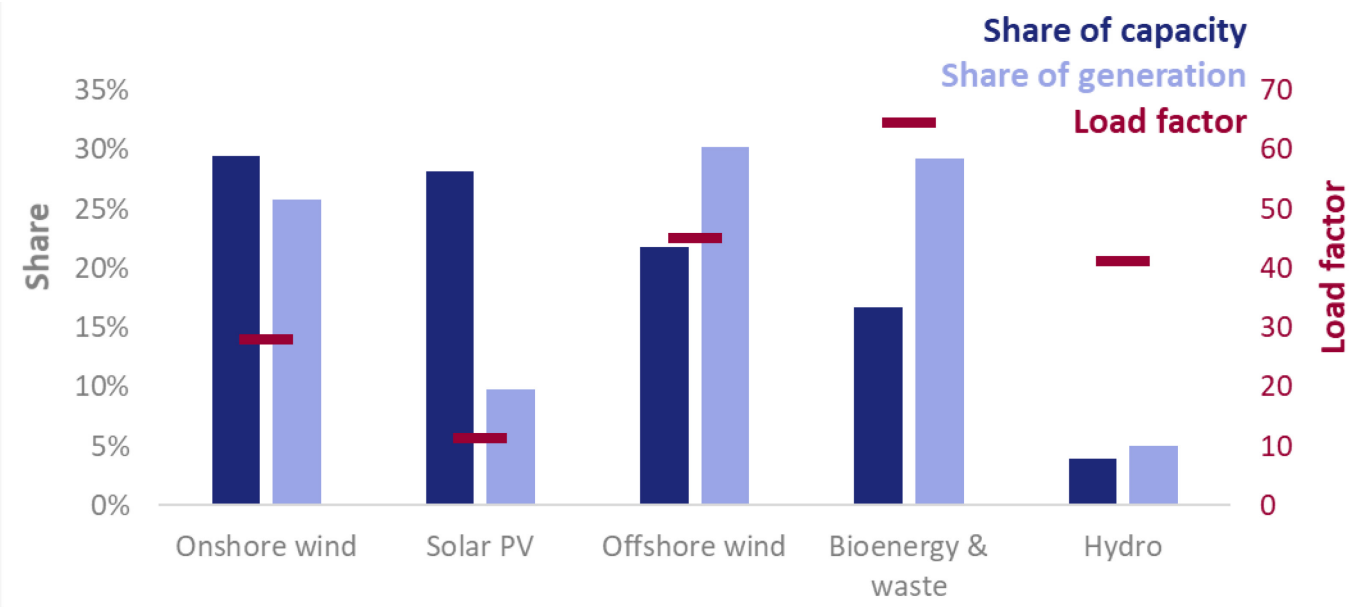


Hydro is a mature technology and generation tends to fluctuate from year to year in line with rainfall. In contrast, solar PV generation only started proliferating from 2012 reflecting the surge in new capacity incentivised via the Feed in Tariff (FiT) support scheme, increasing its share of renewable generation from 3.3 per cent in 2012 to 9.8 per cent in 2020.

Bioenergy saw rapid growth in the years from 2012 as several large power stations converted from coal to plant biomass. Generation from biogas had been fairly stable initially with some generation from landfill and sewage gas plants but as extraction rates have declined at landfill sites, increasing amounts of anaerobic digestion have offset this decrease.

Technologies with a high share of capacity do not necessarily have the highest share of generation because generation is dependent on the load factor. Load factors are the ratio of how much electricity was generated as a proportion of the total generating capacity**.** Within renewables, load factors can be heavily influenced by weather conditions, wind speeds on wind load factors, sun hours for the load factor for solar PV and, to a lesser extent, rainfall on load factor for hydro. Chart 6.5 compares the key technologies' share of capacity and generation alongside the load factor for 2020.

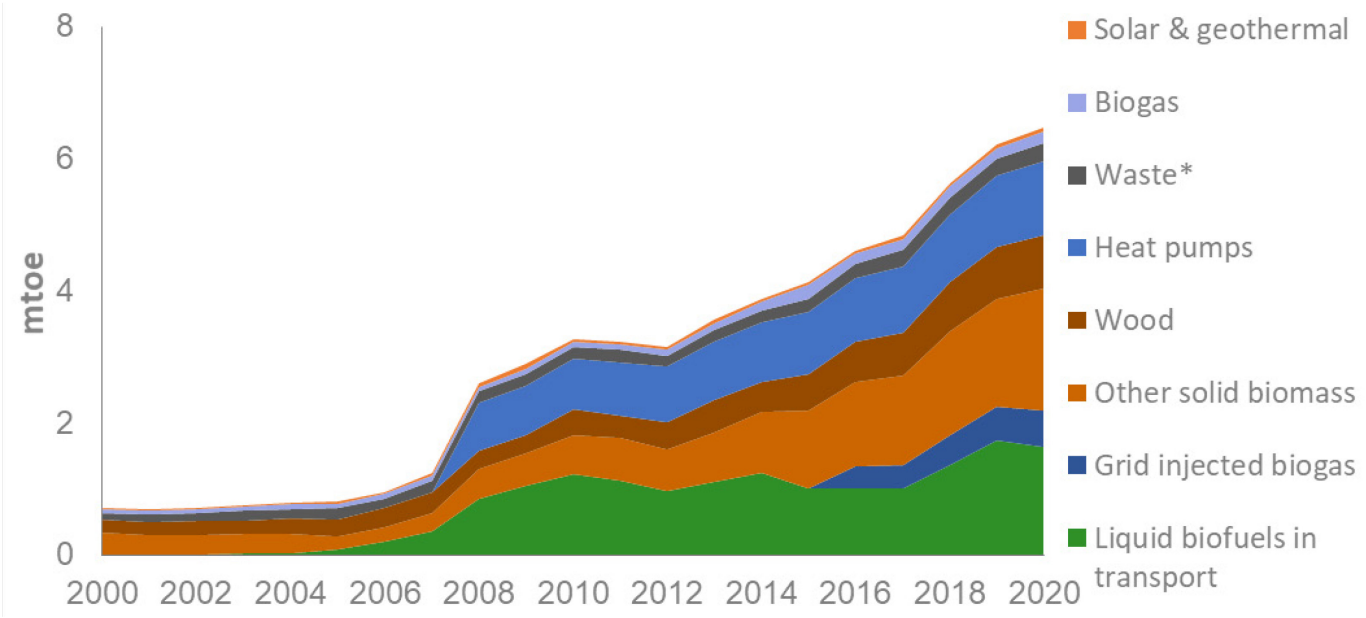
Chart 6.5 Relative share of capacity and generation and load factors 2000 (Table 6.5)



Thermal generation such as bioenergy and waste tend to have high load factors as indicated by the relatively high share of generation compared to capacity. Conversely, solar PV has a very low load factor due to limited hours of sunlight.

In 2020, the load factor for overall renewables was the highest ever reported. On an unchanged configuration basis, where only sites operating for the full year are included, the load factor was 41.6 per cent, the highest since 2008. Favourable weather conditions such as strong wind speeds and high rainfall contributed to the increase, and potentially increasing efficiencies in thermal generation.

Chart 6.6 Other renewable fuel uses; heat, transport, and grid injected biogas (Table 6.6)



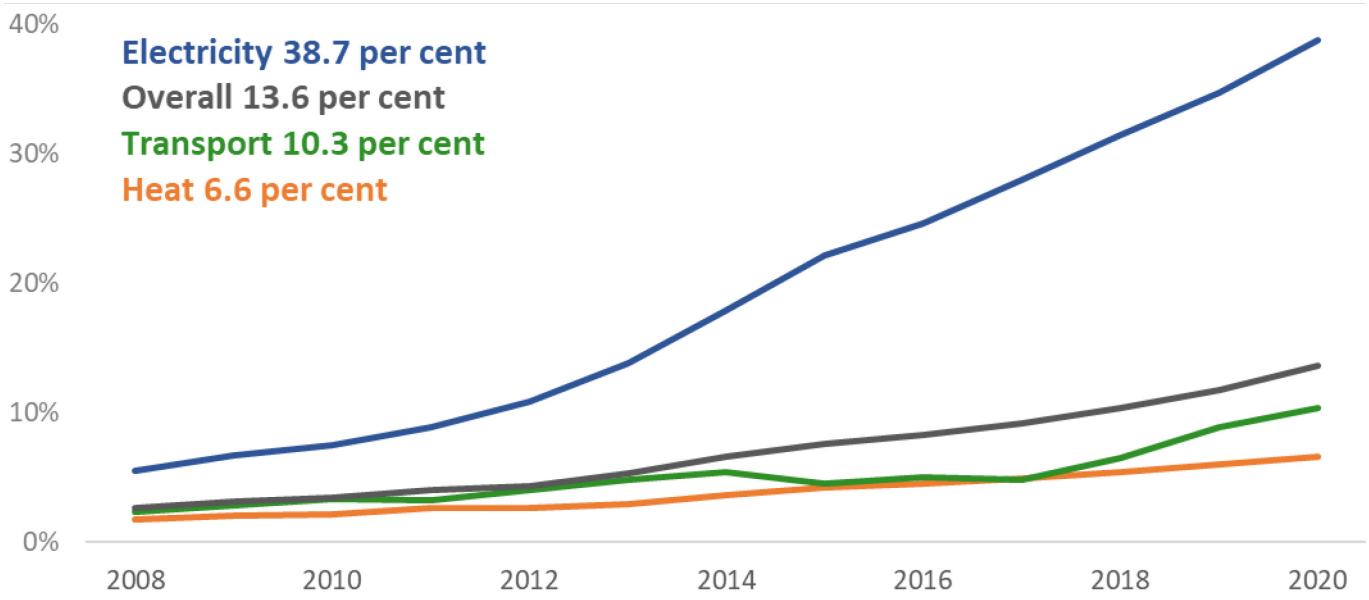
**Including non biodegradable waste*

Whilst electricity generation represents three quarters of renewable fuel demand, heat also accounts for a sizable proportion (16 per cent) with liquid biofuels (6.3 per cent) and of increasing importance, biogas injected into the grid (2.1 per cent). Between 2019 and 2020, renewable heat increased by 7.6 per cent with most of the increase in plant biomass though heat pumps also increased by 4.1 per cent with new installations.

Liquid biofuel in transport fell in 2020 by 5.6 per cent. Liquid biofuels are blended with diesel and motor spirit and the drop in demand is due to markedly lower demand for transport fuels due restrictions arising from the Covid-19 pandemic.

Until 2016, only minimal amounts of biogas from anaerobic digestion sites were injecting into the grid; with support from the Renewable Heat Incentive, it is of increasing importance in the renewable energy mix increasing by 9.0 per cent in 2020. It also now includes some sewage gas being injected (still just representing 10 per cent but increasing at a higher rate than anaerobic digestion sites).

Chart 6.7 Renewable energy as a proportion of total final consumption (Table 6.7)



Progress in the growth of renewable energy as a proportion of final consumption was separately monitored as part of a European Union Directive, the Renewable Energy Directive (RED). The RED set the UK a target to derive 15 per cent of total energy consumption by 2020 from renewable sources. The overall target covered electricity[6], heat[7], and transport, there was a separate target for transport to derive 10 per cent from renewable sources, including liquid biofuels and renewable electricity. The final outturn for the RED was **13.6 per cent against the 15 per cent overall target and 10.3 per cent for transport, an 11 percentage point increase since 2008.**

[6] The proportion of renewable electricity using RED methodology was 38.7 per cent, lower than the 43.1 per cent referenced in the key points section. This is due to the 'normalised' methodology in the RED, whereby wind generation is calculated using an average of the load factors.

[7] Domestic wood consumption has been revised downwards following new estimates arising from a Defra study on domestic consumption. This resulted in a change from 2,241 ktoe to 733 ktoe in the 2018 reference year which has been applied to the time series to 2008. The heat pump series has also been back corrected to 2008, removing a previous step change in 2015. The methodology note (link) provides further detail.

Chapter 7: Combined Heat and Power (CHP)

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Key headlines

In 2020, there were 2,659 CHP sites, 81 more than in 2019. This represented an additional 50 MW of electrical capacity, a 0.8 per cent increase.

CHP qualifying output represented 7.7 per cent of total electricity generation, a 0.4 percentage point increase on 2019.

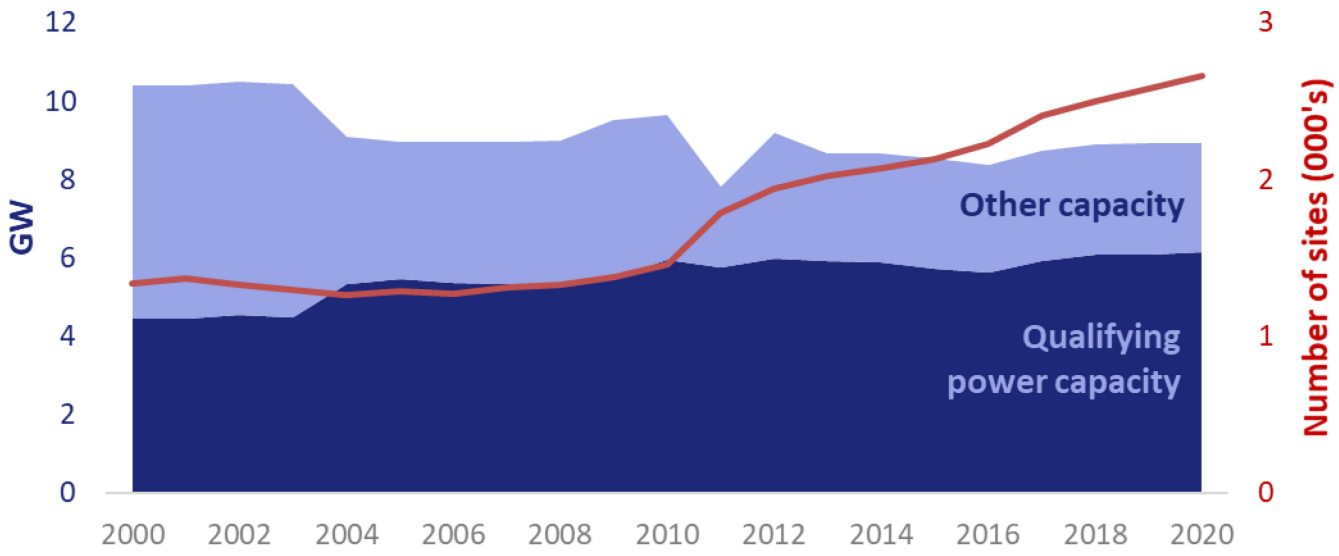
Gas continues to be the main fuel consumed in CHP plants (almost three quarters of fuel input), representing 8.5 per cent of gas demand.

In 2020, renewable fuel accounted for 15 per cent of total CHP fuel, similar to 2019.

Emissions savings from cogeneration (compared to generating electricity and heat separately) was 9.66 $MtCO_2$ in 2020 compared to all fossil fuels, 3.14 $MtCO_2$ when including renewables and nuclear.

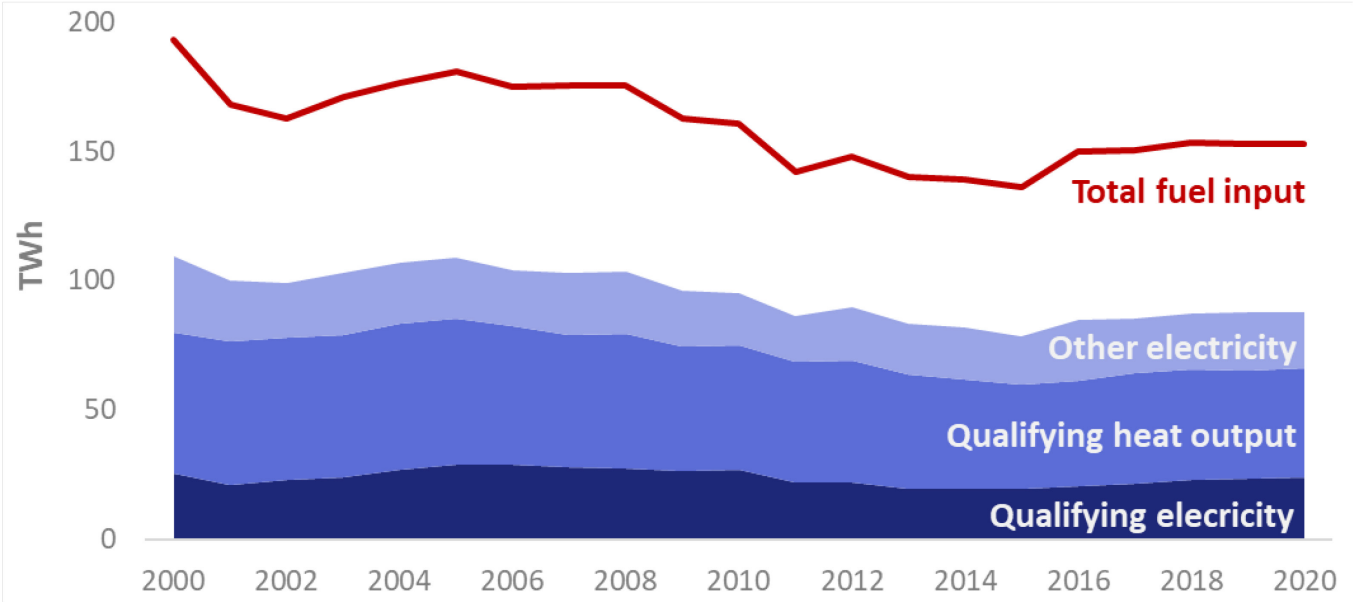
CHP, sometimes referred to as cogeneration, is the simultaneous generation of electricity and heat resulting in improved efficiencies when compared to meeting electricity and heat demands separately. The data for this section is primarily collected in support of the CHP Quality Assurance programme (CHPQA) but is supplemented with other sources to provide as comprehensive a picture as possible for UK CHP statistics. The CHPQA programme assesses and certifies schemes eligible for various incentives; not all output from a scheme is eligible, but where it is, it is referred to as 'good quality', or qualifying. Chart 7.1 shows the qualifying and other (non-qualifying) capacity compared to the number of schemes.

Chart 7.1 Comparison of total and qualifying electrical capacity from 2000



Since 2000, the number of schemes has almost doubled and although total capacity has fallen by 14 per cent, qualifying capacity has increased by 38 per cent resulting in its share increasing from 43 per cent in 2000 to 69 per cent in 2020. Chart 7.2 shows CHP outputs qualifying and non-qualifying compared to total fuel input.

Chart 7.2 Comparison of total fuel and CHP outputs from 2000

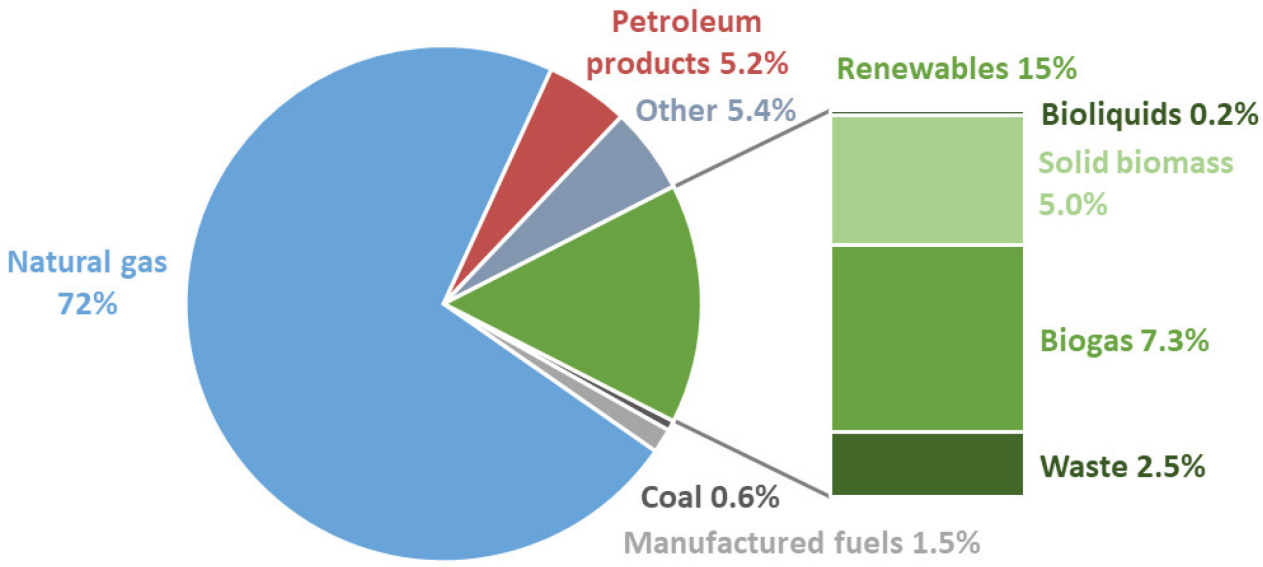


In 2020, three quarters of CHP outputs were deemed to be qualifying, around two thirds of which was heat. Although not a perfect relationship, CHP outputs tend to be driven by the underlying difference between the price of gas and electricity, the spark gap; the larger the gap, the cheaper gas is relative to electricity which makes cogeneration more economically viable. This explains the decline from 2006 to 2015 and the subsequent turnaround following a widening of the spark gap in 2013.

The efficiency of CHP schemes in 2020 is estimated at 69.1 per cent for qualifying electricity and heat. This compares with 48.5 per cent when taking into account qualifying electricity only, in line with the overall electricity efficiency for combined cycle gas turbines (Table 5.10), the leading CHP technology accounting for half of all schemes.

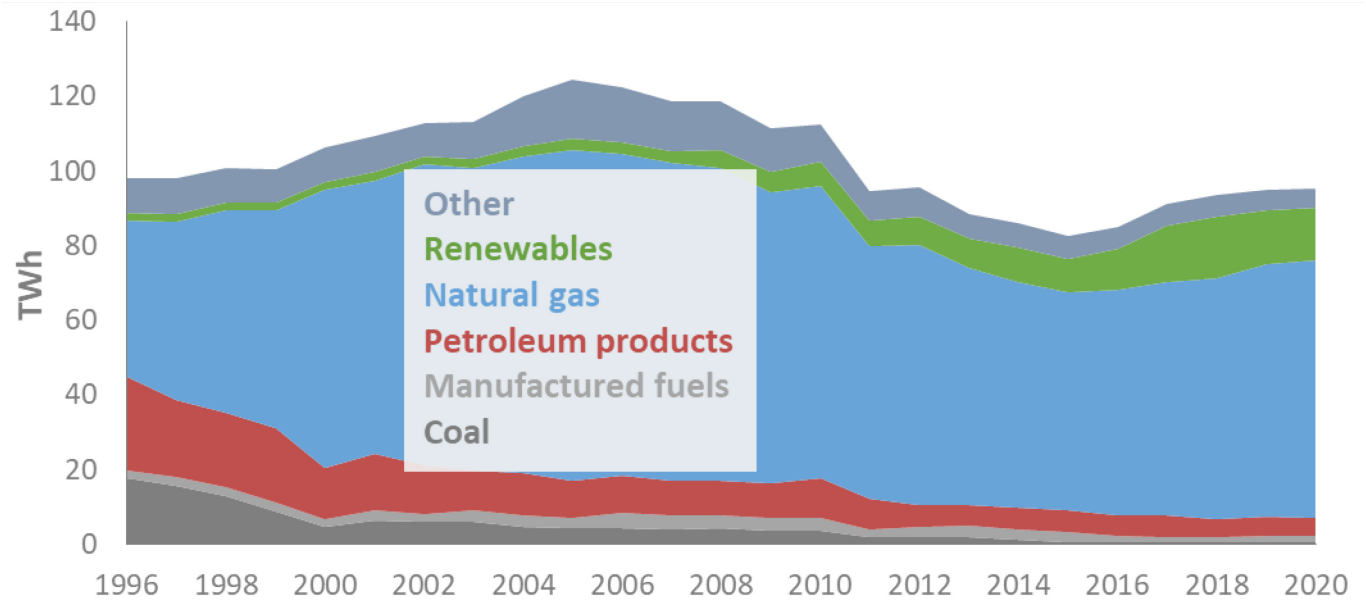
Gas remains the main fuel consumed by CHP schemes representing 72 per cent of the total in 2020, with renewables accounting for the next highest share at 15 per cent. Fossil fuels other than gas now account for just 7.5 per cent.

Chart 7.3 Fuel mix in 2020 (Tables 7.2 and 7.9)



Over the longer term, the fuel mix has changed little since 2000 following rapid changes between 1996 (the first year data became available) and 2000. Chart 7.4 shows this long-term trend with the increasing share of natural gas evident alongside the falling use of coal.

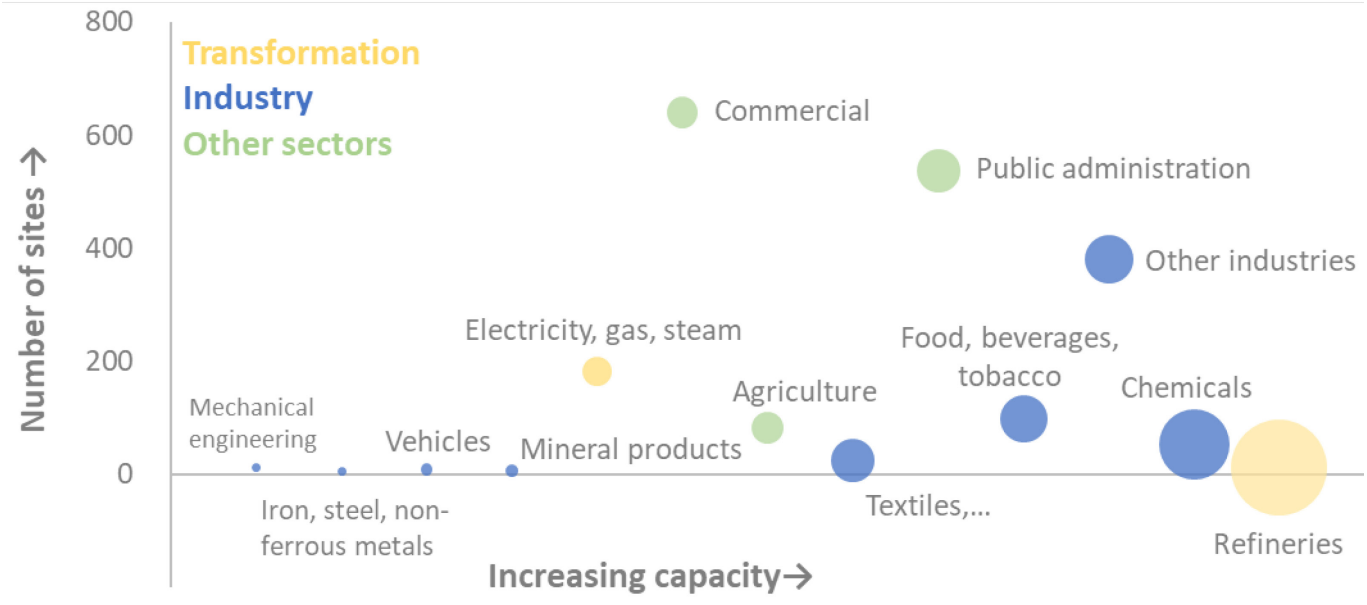
Chart 7.4 Trends in fuel demand for CHP 1996 to 2020 (Table 7.9)



In 1996, natural gas' share was just 43 per cent. By 2000, it had risen to 70 per cent and has remained fairly consistent since. Conversely, coal and manufactured fuels' share represented 20 per cent in 1996 but had plummeted to 6.3 per cent by 2020. Use of renewables was stable at around 2 per cent until as recently as 2008 but has steadily increased to a maximum of 18 per cent in 2018, though it has fallen off slightly to 15 per cent in 2020.

CHP is deployed across a variety of sectors including power generation, refineries, industry and commercial. Chart 7.5 shows the relationship between capacity by sector and the number of schemes.

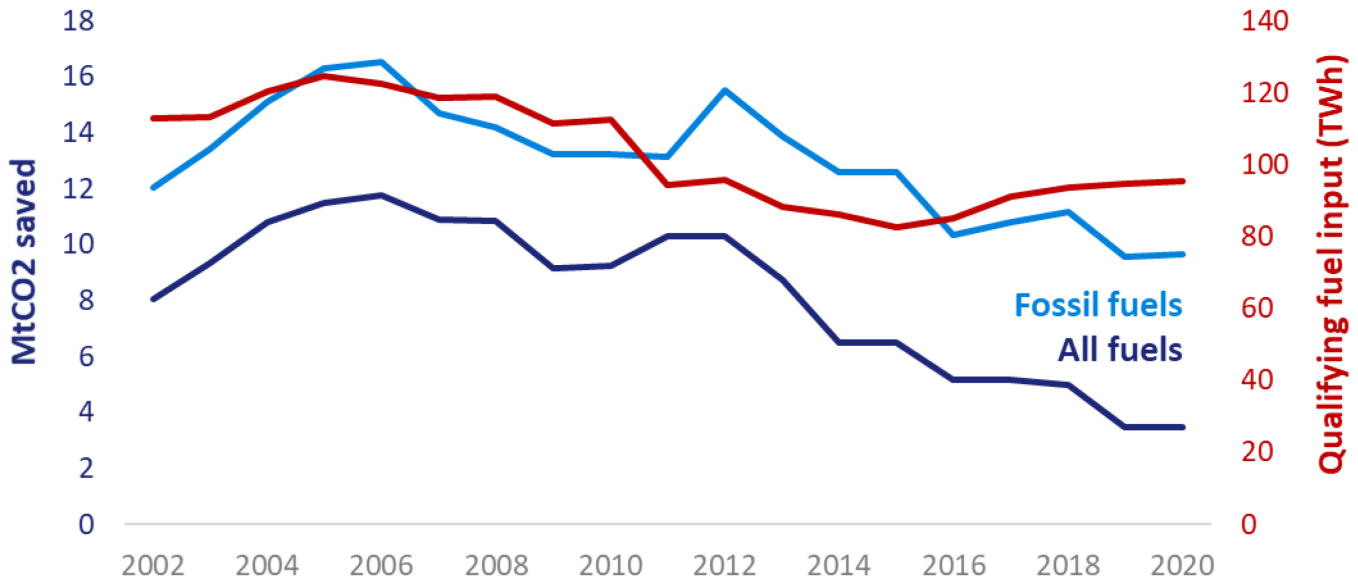
Chart 7.5 CHP capacity and proliferation by sector (Table 7.8 (b))



Although refineries account for the largest share of capacity, 36 per cent, it represents just 0.6 per cent of the number of sites. In contrast, the commercial sector has 31 per cent of the sites but accounts for just 3.8 per cent of the capacity.

The efficiency gains through cogeneration offer emissions savings, the key driver behind government support for CHP. An estimate of these savings is shown in Table 7.11, a new table included this year to show a longer time series. Total emissions from CHP are dependent on the fuel consumed by schemes but the emissions saved are additionally dependent on the fuel mix of the electricity displaced, i.e., the carbon intensity of the grid which is falling due to the increasing proportions of primary nuclear and renewables from wind, solar, and hydro. This in turn results in lower emissions saved as CHP schemes are limited to fuels producing heat as well as electricity, a higher proportion of which are fossil fuels.

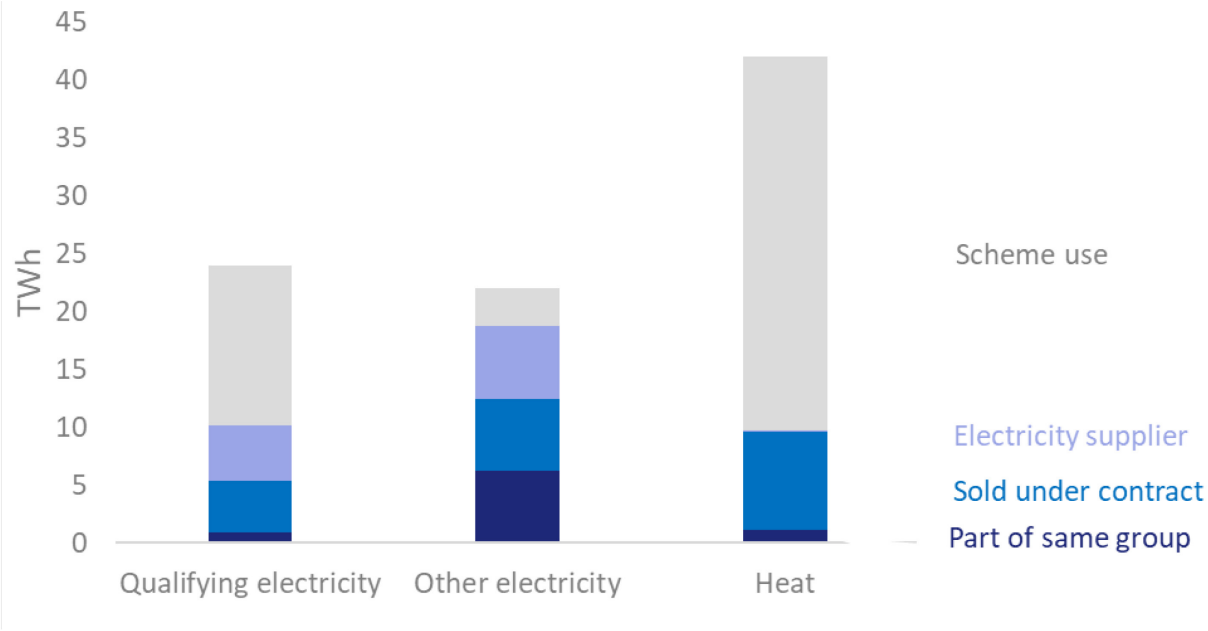
Chart 7.6 Emissions saved through qualifying CHP 2002-2020



Although to a lesser extent, carbon savings are also falling when compared to grid generation from fossil fuels only. This reflects the comparatively larger shift from higher to lower carbon content fossil fuels (such as from coal to gas) for grid generation relative to CHP fuels.

In 2020, 30 per cent of qualifying outputs (heat and electricity) were exported with the remaining 70 per cent being used within the same site. Exports are classified as being either exported to a consumer within the same qualifying group of companies, to an electricity supplier, or sold under contract (i.e. to a consumer not part of the same group). Chart 7.7 shows a comparison for exports compared to own use by heat, qualifying and other electricity generation.

Chart 7.7 CHP exports and own use 2020



Less than half of qualifying electricity is exported (42 per cent) with the majority being split between power suppliers and sold under contract. Other generation, however, is mostly exported (85 per cent) with exports fairly evenly distributed across the output sectors. Heat is mostly consumed within the CHP scheme but of the heat which is exported, the majority is sold under contract (this heat is reported under the 'heat sold' column in DUKES Table 1.1).

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Chapter 7 Combined heat and power

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7.2 Fuel used to generate electricity and heat in CHP installations
7.3 Fuel used by types of CHP installation
7.4 CHP - electricity generated by fuel and type of installation
7.5 CHP - electrical capacity by fuel and type of installation
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7.8 CHP capacity, output, and total fuel use by sector
7.9 CHP - use of fuels by sector
7.10 Large scale CHP schemes in the United Kingdom, December 2019
7.11 CHP – savings of carbon dioxide emissions

CHP long term trends

7.1.1 Combined Heat and Power: capacity, generation, and fuel use
7.1.2 Combined Heat and Power: capacity and electricity generation by capacity band

Symbols used in data tables

.. not available - nil or not separately available r revised since the previous edition

Individual entries in the tables are rounded independently and this can result in totals, which are different from the sum of their constituent items. Some of the data shown in this Digest may contain previously unpublished revisions and estimates of trade from HM Revenue and Customs and the Office for National Statistics. These data are included in Annex G.

Annexes and annex tables

Full annex documents and tables can be found by visiting the DUKES collection page.

Annex A: Energy and commodity balances, conversion factors, calorific values and density of fuels

A.1 Estimated average calorific values of fuels 2020
A.2 Estimated average gross calorific values of fuels 1980, 1990, 2000, 2010 and 2018 to 2020
A.3 Estimated average net calorific values of fuels, 1980, 1990, 2000, 2010 and 2018 to 2020
A.4 Estimated average density of fuels 2002 to 2020

Annex B: Glossary and acronyms

Annex C: Further sources of UK energy publications

Annex D: Major events in the energy industry

Annex E: Energy and the environment

E.1 Gas flared and vented by oil and gas fields and terminals

Annex F: Oil and gas resources

F.1 Crude oil and Natural Gas Liquids production
F.2 Gas production
F.3 Natural Gas Liquids net production
F.4 Disposals of crude oil

Annex G: Foreign Trade

G.1 Imports and exports of fuels
G.2 Imports and exports of solid fuels
G.3 Imports and exports of crude oil and petroleum products
G.4 Imports and exports of crude oil by country
G.5 Physical imports and exports of gas
G.6 Imports and exports of wood pellets and other wood
G.7 Value of imports and exports of fuels

Annex H: Flow charts

Annex I: Energy balance net calorific values

I.1 Aggregate energy balance: net calorific values, 2004 to 2020

Annex J: Heat reconciliation

J.1 Heat sold reallocation, 1999 to 2020

Additional information

This section outlines the key principles when presenting energy statistics to help you understand the balance data tables. More information can be found in Annex A: Energy and commodity balances, conversion factors, calorific values and density of fuels. Annex B contains a glossary, which provides definitions of technical terms used. Annexes A and B can be accessed from the main DUKES page.

Balance principles

Balances are divided into two types, each of which performs a different function:

1. Commodity balance - a balance for each energy type that uses specific measurement units usually associated with that commodity. It shows the flow of the commodity from its sources of supply through to its final use. Commodity balances are presented in the individual fuel chapters of this publication.
2. Energy balance - presents the commodity balances in a common unit and places them alongside one another in a manner that shows the dependence of the supply of one commodity on another. The energy balance format is used in Chapter 1.

Both types show the flow of the type of energy from its supply through to its final use. The following sections give an overview of the supply and demand flows shown in each type of balance.

Supply to the energy balances

Production
This covers indigenous production and generation or manufacture of energy using other energy sources as fuel (for example, heating water using gas to produce steam turbine electricity).

Other sources
This covers sources that do not represent “new” supply. These may be recycled products, recovered fuels (slurry or waste coal), electricity from pumped storage plants, or transfers of ethane, propane, and butane from gas stabilisation plants at North Sea terminals.

Imports and exports
These figures relate to energy moving into or out of the UK. Exported commodities are produced in the UK and imported commodities are for use within the UK. The figures thus exclude commodities that move into and out of HM Revenue and Customs bonded areas.

Marine bunkers
These are deliveries of fuels (usually fuel oil or gas oil) to ships of any flag for consumption during their voyage to other countries.

Stock changes
Additions to and withdrawals from stocks held by producers and transformation industries correspond to withdrawals from (- sign) and additions to supply (+ sign), respectively.

Transfers
A movement of a fuel out of one type is shown with a negative sign, to indicate that it has been withdrawn from supply. The movement into the other fuel is shown as a positive. The transfers row would ideally sum to zero, but differences in calorific values can result in non-zero values. There are several reasons why quantities may be transferred from one commodity balance to another:

- a commodity may no longer meet the original specification and be reclassified.
- the name of the commodity may change through a change in use.
- to show quantities returned to supply from consumers. These may be by-products rather than fuels.

The total supply available for national use is obtained by summing these flows in the balance.

Statistical differences

Any excess or shortfall in supply compared to demand is shown as a statistical difference. A negative figure indicates that demand exceeds supply. These arise because data has been gathered from a variety of independent sources and reflect differences in timing, in definition of activity or commodity. Differences also arise in the measurement of the flow of the commodity. A non-zero statistical difference is normal and, within reason, is preferable to a statistical difference of zero, which would suggest that a data provider has adjusted a figure to balance the account.

Demand in the energy balances

The demand section is divided into demand for transformation, for use in the energy industries, and a section covering uses by final consumers.

Transformation
This covers processes and activities that transform the original primary (and sometimes secondary) commodity into another type. Most transformation corresponds to an industry whose main business is to manufacture a particular type of energy such as electricity generators. Some activities produce another commodity as a by-product. All are included in the energy balances.

Electricity generation
Quantities of fuels burned for the generation of electricity. The activity is divided into two parts, covering the major power producers (for whom the main business is the generation of electricity) and autogenerators (who produce electricity as a by-product of another process). Where a generator uses combined heat and power plant, the figures include only the part of the fuel use corresponding to the electricity generated.

Heat generation
Quantities of fuel burned to generate heat that is sold under contract to a third party. This includes heat that is generated and sold by combined heat and power plants and by community heating schemes (also called district heating).

Petroleum refineries
Crude oil, natural gas liquids and other oils needed by refineries for the manufacture of finished oil products.

Coke manufacture and blast furnaces
Quantities of coal for coke ovens and all fuels used within blast furnaces. The consumption of fuels for heating coke ovens and the blast air for blast furnaces are shown under Energy industry use.

Patent fuel manufacture
Coals and other solid fuels used for the manufacture of solid patent fuels.

Other
Any minor transformation activities not specified elsewhere.

Energy industry use
Consumption by both extraction and transformation industries to support the transformation process (but not for transformation itself). Typical examples are the consumption of electricity in power plants, or the use of extracted gases on oil and gas platforms.

Losses
Intrinsic losses that occur during the transmission and distribution of electricity and gas (including manufactured gases). Other metering and accounting differences for gas and electricity are within the statistical difference, as are undeclared losses in other commodities.

Final consumption
This covers consumption of commodities for energy and non-energy uses. The energy disappears from the account after use. Final consumption for energy purposes is divided into use by sector of economic activity. The classification of consumers according to their main business follows, as far as practicable, Standard Industrial Classification codes (SIC 2007). The section on Sector breakdowns below shows the breakdown of final consumers used, and how this corresponds to SIC codes 2007.

Sector breakdowns

Categories for final consumption are defined by Standard Industrial Classification codes 2007:

Category of user	SIC 2007
Fuel producers	05-07, 09, 19, 24.46, 35
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
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 by SIC, defined as deliveries to residential properties

The qualifications to, and constraints on, use of the classification are described in the energy balance methodology note.

Technical information

Methodology

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 very large. Figures relate to the United Kingdom unless otherwise indicated. Further information is available from the Oil & Gas Authority at www.ogauthority.co.uk/.

Standard conversion factors

This Digest uses the tonne of oil equivalent (toe) as the common unit of energy for comparing and aggregating fuels. The following table gives factors for converting between this unit and alternative units of energy found in this and other publications (see Chapter 1, Technical notes and definitions and Annex A).

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

A selection of estimated average gross calorific values for 2020 (see also Annex A)

Fuel category	GJ per tonne	Fuel category	GJ per tonne
Solid fuels		Renewable sources	
Coal		Domestic wood	16.3
All consumers (weighted average)	26.9	Industrial wood	20.3
Power stations (including imports; weighted average)	26.5	Municipal solid waste	9.9
Iron and steel	30.4	Petroleum	
Other industries (weighted average)	26.7	Crude oil (weighted average)	45.7
Imported coal (weighted average)	28.4	Petroleum products (weighted average)	46.2
Exported coal (weighted average)	28.0	Petrol	47.0
Coke	29.8	Gas/diesel oil	45.3
Coke breeze	29.8	Road diesel	45.6
Other manufactured solid fuel	29.6	Fuel oil	43.4
Gases			
Natural gas (produced)	39.9		
Landfill gas	21-25		
Sewage gas	21-25		

Geographical coverage

The geographical coverage of the statistics is the United Kingdom. However, within UK trade statistics, shipments to the Channel Islands and the Isle of Man from the United Kingdom are not classed as exports. Supplies of solid fuel and petroleum to these islands, from the UK, are therefore included as part of United Kingdom inland consumption or deliveries.

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. BEIS's statements of compliance with the Code are available online, as well as the UK Statistics Authority reports on their regular assessments of BEIS's energy statistics. The authority's recommendations have been incorporated into this publication and other BEIS energy statistical publications and outputs.

DUKES tables contain revisions to some of the previously published figures, and where practicable the revised data have been indicated by an 'r'. The 'r' marker is used whenever the figure has been revised from that published in the prior Digest, even though some figures may have already been amended on the published version of the tables. A table showing the size of revisions to key aggregates is shown below. Statistics on energy in this Digest are classified as National Statistics. This means that they are produced to high professional standards as set out in the UK Statistics Authority's Code of Practice for Official Statistics. The Code of Practice requires that all the public bodies that produce official statistics "Publish a revisions policy for those outputs that are subject to scheduled revisions, and provide a statement explaining the nature and extent of revisions at the same time that they are released". The following statement outlines the policy on revisions for energy statistics.

It is intended that any revisions should be made to previous years' data only at the time of the publication of the Digest. In exceptional circumstances previous years' data can be amended between Digest publication dates, but this will only take place when quarterly Energy Trends is published. The reasons for substantial revisions will be explained in the 'Highlights' sheet of the table concerned.

Valid reasons for revisions of Digest data include:

- Revised and validated data received from a data supplier.
- The figure in the Digest was wrong because of a typographical or similar error.
- In addition, when provisional annual data are published in Energy Trends in March, growth rates are liable to be distorted if the prior year's data are constrained, when revisions are known to be required. In these circumstances the prior year's data will be amended for all affected tables in Energy Trends and all affected Digest tables will be clearly annotated to show that the data has been updated in Energy Trends.

All validated amendments from data suppliers will be updated when received and published in the next statistical release.

All errors will be amended as soon as identified and published in the next statistical release.

Data in energy and commodity balances format will be revised on a quarterly basis, to coincide with the publication of Energy Trends.

This year, the revisions window for DUKES has been opened back to 2008 to include more accurate data on the supply and demand of domestic wood and heat pumps in the bioenergy and waste commodity balances.

Revisions since DUKES 2020

Thousand tonnes of oil equivalent	2018	2019	Percentage revisions to 2019 data
Production	-1,119	-2,039	-1.6%
Primary supply	-2,841	-4,990	-2.5%
Primary demand	-2,369	-4,532	-2.3%
Transformation	-57	1,082	-3.3%
Energy industry use	-47	-163	-1.3%
Final consumption	-2,240	-3,122	-2.1%
Industry	185	80	0.4%
Transport	18	-20	0.0%
Other	-2,444	-3,203	-5.1%
Non energy use	0	21	0.3%

Background to the Digest

This issue of the Digest of United Kingdom Energy Statistics (DUKES) continues a series which commenced with the Ministry of Fuel and Power Statistical Digest for the years 1948 and 1949, published in 1950. The Ministry of Fuel and Power Statistical Digest was previously published as a Command Paper, the first being that for the years 1938 to 1943, published in July 1944 (Cmd. 6538).

The current publication consists of seven chapters and four annexes. The first chapter deals with overall energy. The other chapters cover the specific fuels, renewable sources of energy and combined heat and power. The annexes cover conversion factors and calorific values, a glossary of terms, further sources of information and major events in the energy industries.

Where necessary, data have been converted or adjusted to provide consistent series. However, in some cases changes in methods of data collection have affected the continuity of the series. The presence of remaining discontinuities is indicated in the chapter text or in footnotes to the tables.

Chapters 6 and 7 summarise the results of surveys conducted by Ricardo Energy & Environment on behalf of BEIS, which complement work undertaken by BEIS. These chapters estimate the contribution made by renewable energy sources to energy and combined heat and power (CHP) production and consumption in the United Kingdom.

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National Statistics and user engagement

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 United Kingdom Statistics Authority has designated these statistics as National Statistics, in accordance with the Statistics and Registration Service Act 2007 and signifying compliance with the UK Statistics Authority: Code of Practice for Statistics.

The continued designation of these statistics as National Statistics was confirmed in September 2018 following a compliance check by the Office for Statistics Regulation. The statistics last underwent a full assessment against the Code of Practice in June 2014.

Designation can be broadly interpreted to mean that the statistics:

- meet identified user needs.
- are well explained and readily accessible.
- are produced according to sound methods, and
- are managed impartially and objectively in the public interest.

Once statistics have been designated as National Statistics it is a statutory requirement that the Code of Practice shall continue to be observed.

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.

Enquiries about statistics in this publication should be made to the contact named at the start of the relevant chapter. Brief extracts from this publication may be reproduced provided that the source is fully acknowledged. General enquiries about the publication, and proposals for reproduction of larger extracts, should be addressed to BEIS.

The Department for Business, Energy and Industrial Strategy (BEIS) reserves the right to revise or discontinue the text or any table contained in this Digest without prior notice.

Related statistics

The Department for Business, Energy and Industrial Strategy make available other publications related to energy supply and demand that may be of interest. A full list of these and other related energy publications can be found in DUKES Annex C: Further sources of UK energy publications.

Energy Trends
More frequent monthly and quarterly data are available for total energy, solid fuels and derived gases, petroleum, gas, electricity, and renewables:
www.gov.uk/government/organisations/department-for-business-energy-and-industrial-strategy/about/statistics

Energy prices
Monthly and quarterly prices by consumption sector and international comparisons of prices paid:
www.gov.uk/government/organisations/department-for-business-energy-and-industrial-strategy/about/statistics

Energy Flow Chart
Annual publication illustrating the flow of primary fuels from home production and imports to their eventual final uses. They are shown in their original state and after being converted by secondary fuel producers:
www.gov.uk/government/collections/energy-flow-charts.

UK Energy in Brief
Annual publication summarising the latest statistics on energy production, consumption, and prices in the United Kingdom. The figures are taken from this Digest of UK Energy Statistics:
www.gov.uk/government/collections/uk-energy-in-brief

Sub-National Energy Consumption
Annual publication supporting local and regional decision making to deliver national energy policy objectives:
www.gov.uk/government/organisations/department-for-business-energy-and-industrial-strategy/about/statistics

UK Greenhouse Gas Emissions
Show progress against the UK's goals, both international and domestic, for reducing greenhouse gas emissions:
www.gov.uk/government/collections/uk-greenhouse-gas-emissions-statistics

This publication is available from: https://www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes

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