

# Chapter 1: 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.

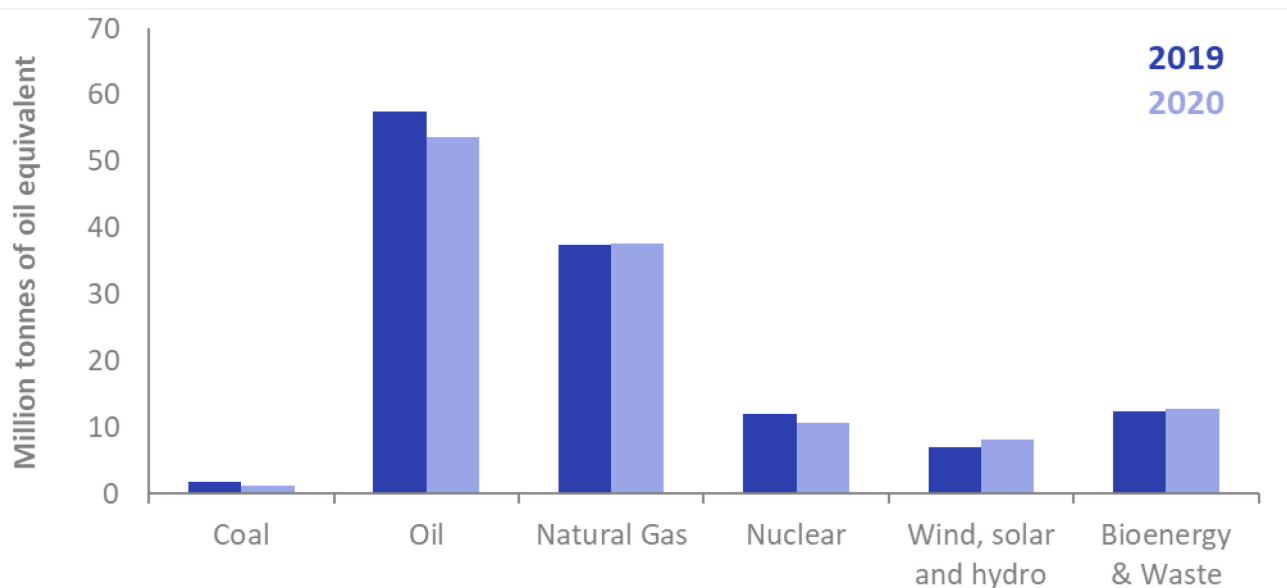
**Low carbon generation also reached a record high of 59.3 per cent** despite a drop in nuclear output due to maintenance outages.

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.

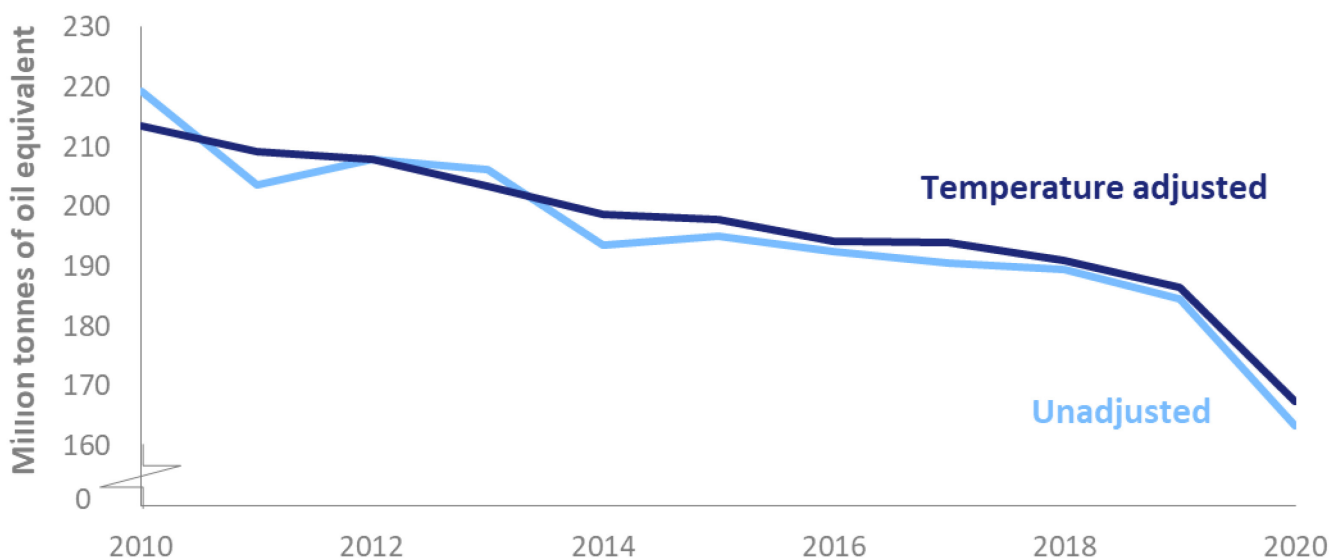
**Chart 1.1 Production by fuels, 2019 and 2020** ([DUKES Tables 1.1-1.3](#))



**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](#))

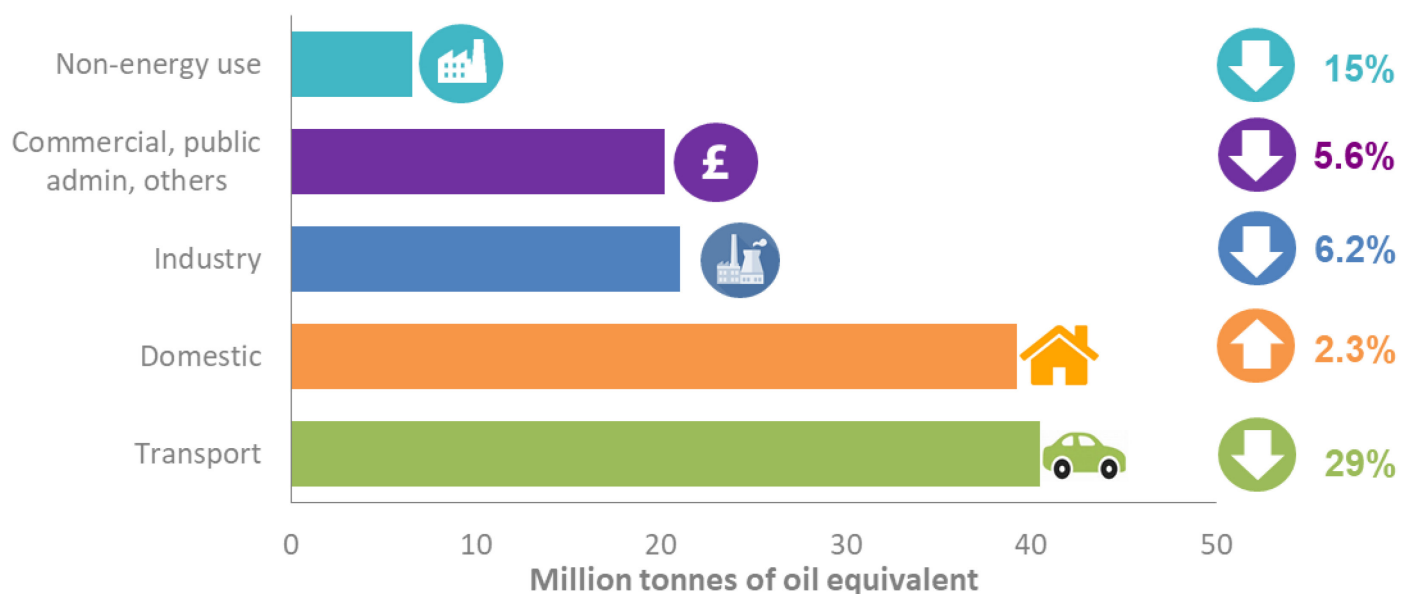


**In 2020 total primary energy consumption was 163.3 mtoe, 11 per cent lower than in 2019, and to levels last seen in the 1950s.**

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](#))



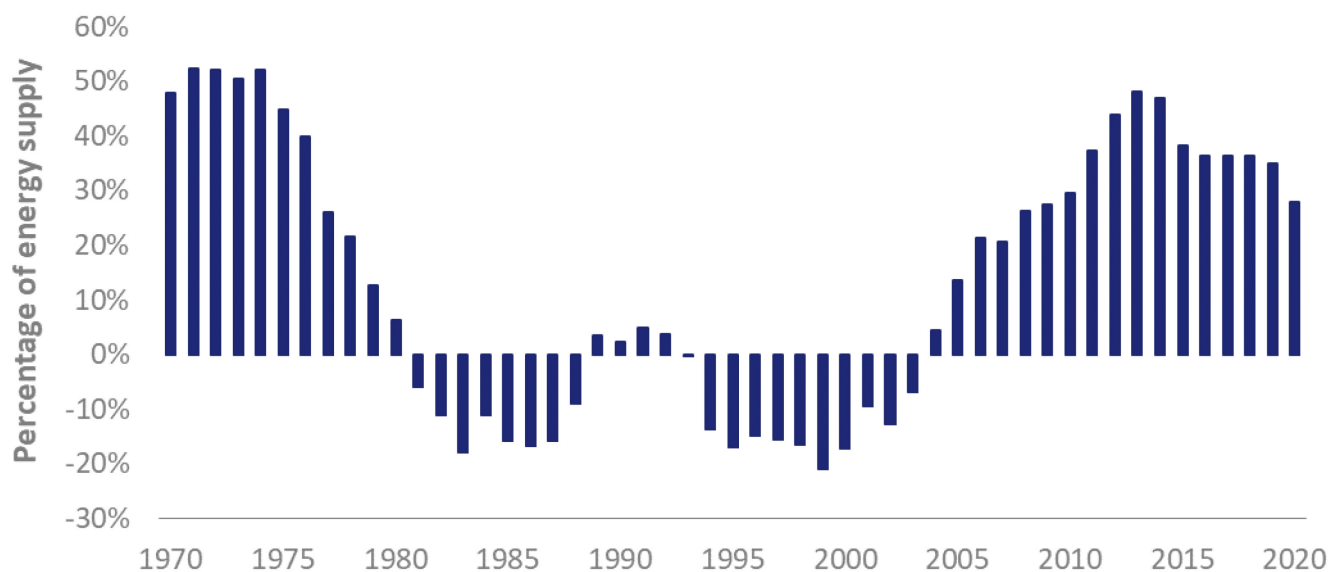
**In 2020 total final energy consumption including non-energy use was 127.5 mtoe, 13 per cent lower than in 2019, again matching demand levels from earlier decades.**

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<sup>1</sup>, 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.

<sup>1</sup> Net imports as a proportion of primary supply (including an addition for the energy supplied to marine bunkers).



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