Chapter 1: Energy

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Key headlines

Energy production fell by 8.3 per cent to a record low level. Oil production fell by 11 per cent to the lowest level since the late 1970s and is down by 36 per cent on pre-pandemic (2019) levels. Nuclear output fell by 15 per cent, to levels last seen in the 1960s, due to reduced capacity and outages and coal reached another record low. Wind, solar and hydro output rose by 2.2 per cent to a record high level due to increased capacity and output from offshore wind and solar.

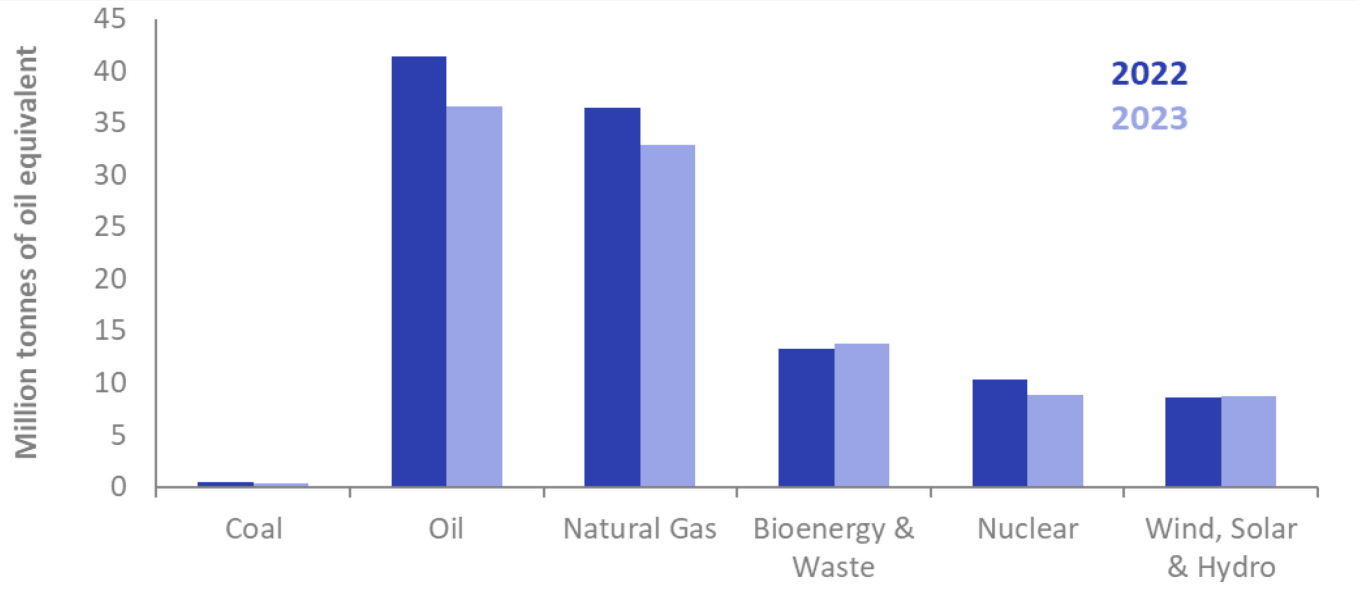
Energy consumption in 2023 remained low, down 1.1 per cent on 2022 and down 11 per cent on 2019. Consumption levels in 2023 fell for all sectors except for transport due to warm weather as well as the impact of higher energy and other prices. Domestics sector consumption fell by 6.0 per cent and industrial sector consumption fell by 1.1 per cent, with both sectors at levels not seen in over fifty years.

Transport demand rose by 3.6 per cent compared to last year but remains 6.5 per cent below pre-pandemic (2019) levels. **Aviation fuel demand rose by 16 per cent**, but is still 7.2 per cent below 2019 levels.

Net imports rose by 6.8 per cent. Imports fell by 6.5 per cent with electricity imports at a record high level, and exports fell by 17 per cent with crude oil exports at a record low level. The UK reverted to being a net importer of electricity in 2023 after being a net exporter in 2022 for the first time in over 40 years. The UK's net import dependency stood at 40.8 per cent, up from 37.0 per cent in 2022.

The bulk of the UK's energy imports, over 90 per cent, comprise oil and gas and **Norway is the UK's primary supplier of energy imports**. The largest share of oil imports in 2023 arrived from the United States, whilst Norway provides the largest share of gas imports.

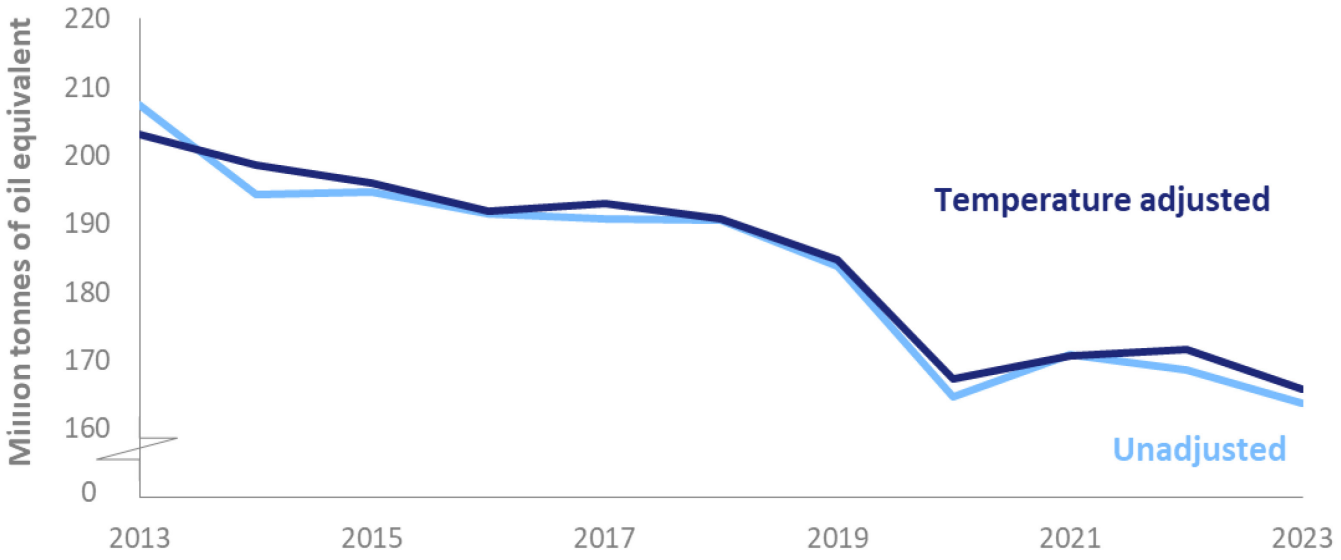
Chart 1.1 Production by fuels, 2022 and 2023 (DUKES Table 1.1)



In 2023 total production was at a record low level of 101.2 million tonnes of oil equivalent, 8.3 per cent lower than in 2022, and 21 per cent lower than pre-pandemic levels. Production levels for all fuels except bioenergy & waste and wind, solar & hydro are down on 2022, with **coal, oil and nuclear output at record lows for this century**. UK production is 66 per cent below the peak recorded in 1999.

In 2023 coal production fell by 21 per cent to a record low level, whilst production of oil fell by 11 per cent to a record low level, with output down by 36 per cent on pre-pandemic (2019) levels. Natural gas production fell by 9.6 per cent and is down 12 per cent on pre-pandemic levels, whilst nuclear output fell by 15 per cent to a record 21st century low due to reduced capacity and numerous outages throughout 2023 across the UK nuclear fleet. Production of bioenergy and waste rose by 3.4 per cent, **whilst wind, solar and hydro output rose by 2.2 per cent to a record high level** due to increased offshore wind and solar output and capacity.

Chart 1.2 Primary energy consumption, 2013 to 2023 (DUKES Tables 1.1 and 1.1.4)



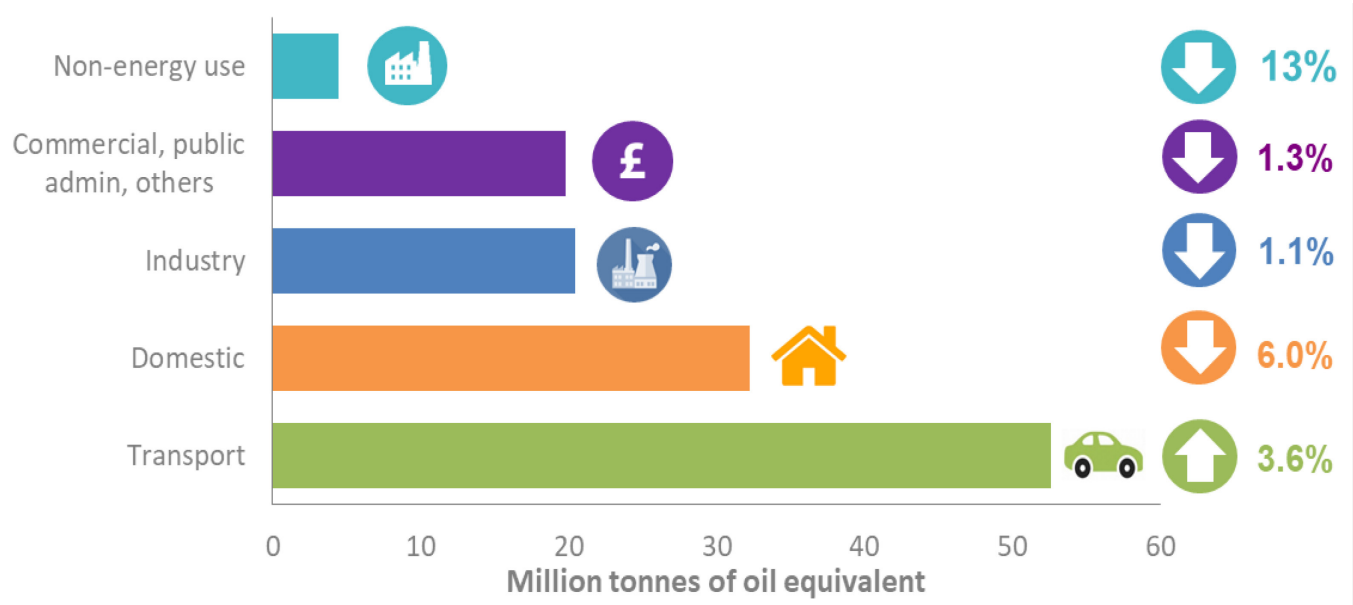
In 2023 total primary energy consumption was 163.8 mtoe, 2.9 per cent lower than in 2022, with near record high temperatures and higher energy and other prices a key factor in the reduced consumption levels.

Primary energy consumption includes use by consumers, fuel used for electricity generation and other transformation activities. On a seasonally adjusted and annualised rate that removes the impact of temperature on demand, consumption was 165.9 mtoe, 3.3 per cent lower than in 2022. Consumption levels on both an unadjusted and adjusted basis were lower than in 2020, when consumption levels were severely impacted by the Covid-19 pandemic.

In 2023 total primary energy consumption levels fell for all fuels except oil, bioenergy & waste, wind, solar and hydro and imports of electricity. Consumption of oil rose by 2.4 per cent, with sales of petrol and diesel down around 10 per cent on (2019) levels. Aviation fuel sales were up significantly on 2022 but remain below pre-pandemic levels. Consumption of bioenergy & waste rose by 1.1 per cent. Primary electricity consumption rose by 6.5 per cent, within which nuclear fell by 15 per cent due to outages, wind, solar and hydro rose by 2.2 per cent, and net imports rose significantly as the UK reverted to being a net importer of electricity after being a net exporter in 2022 for the first time in more than 40 years.

Consumption of coal and other solids fell by 14 per cent due to limited demand from electricity generators, whilst natural gas consumption fell by 10 per cent as electricity generators made more use of renewable sources and households reduced consumption for heating due to higher energy and other prices and warm temperatures.

Chart 1.3 Final energy consumption by sector, 2023 (DUKES Table 1.1)



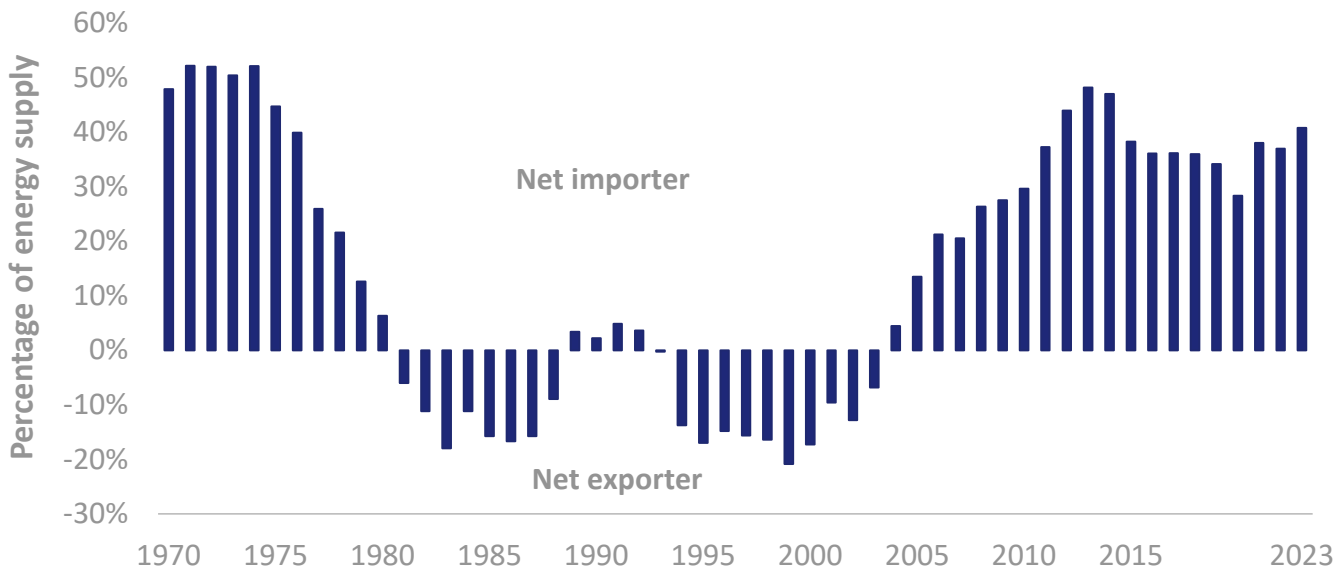
In 2023 total final energy consumption including non-energy use was 129.5 mtoe, 1.1 per cent lower than in 2022, and 11 per cent lower than pre-pandemic (2019) levels.

Except for transport, consumption levels in 2023 all fell due to continued high temperatures and high energy and other prices.

Domestic sector consumption fell by 6.0 per cent to the lowest level in over 50 years, with average temperatures in 2022 broadly similar to the record temperatures seen in 2022 as well changes in consumer behaviour arising from higher prices. Transport sector consumption rose by 3.6 per cent, with road transport (petrol and diesel) consumption rising by 0.2 per cent and air consumption rising by 16 per cent, but still remaining 7.2 per cent below pre-pandemic (2019) levels. Industrial sector consumption fell by 1.1 per cent, again to the lowest level in at least 50 years, and service sector consumption fell by 1.3 per cent with the impact of higher energy and other prices likely a key factor in the reduced consumption levels.

Final energy consumption excluding non-energy use fell by 0.6 per cent, whilst on a temperature corrected basis consumption fell by 2.1 per cent with falls in all sectors except transport. Domestic consumption fell by 7.8 per cent, industrial consumption fell by 5.1 per cent, and other services consumption fell by 2.2 per cent; transport consumption rose by 3.5 per cent.

Chart 1.4 Net import dependency, 1970 to 2023 (DUKES Table 1.1.3)



In 2023 net import dependency was 40.8 per cent[1], 3.8 percentage points higher than in 2022.

Imports in 2023 at 137.4 mtoe were 6.5 per cent lower than in 2022, and 24 per cent lower than their peak in 2013. Gas imports fell 20 per cent from the record levels seen in 2022. Pipeline imports fell 16 per cent as the interconnectors to Belgium and the Netherlands were used to export rather than import for the majority of the year, whilst Liquefied Natural Gas (LNG) imports fell 24 per cent. In 2022 the UK's substantial LNG regasification infrastructure had operated as a land-bridge for increased imports, which were then exported to mainland Europe to help reduce its dependence on Russian gas.

Exports in 2023 at 68.0 mtoe were 17 per cent lower than 2022 but are still 3.3 per cent higher than the record 21st century low level of 2021. Electricity exports more than halved in 2023, with the UK a net importer again after being a net exporter for the first time in over 40 years in 2022 to help meet demand in France from reduced nuclear output there.

Net imports at 69.5 mtoe were 6.8 per cent higher than in 2022 and accounted for 40.8 per cent of consumption in 2023, up from 37.0 per cent in 2022 and at the highest share level since 2014.

Despite net imports rising, the UK decreased its use of fossil fuels. The main fossil fuel sources in the UK are coal, gas and oil. In 2023, the share of primary energy consumption from fossil fuels fell to 76.8 per cent from 78.3 per cent in 2022, whilst that from low-carbon sources stood at 20.7 per cent, down marginally on 2022.

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

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