

# Chapter 2: Solid Fuels and Derived Gases

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## Key headlines

**Demand for coal rose slightly in 2021, by 2.8 per cent to 7.3 million tonnes** compared to 2020. This was driven by an increase in consumption by electricity generators from last year's record low when strong winds and lower electricity demand reduced the need for fossil-fuelled generation.

**Consumption of coal for electricity generation rose 14 per cent to 2.7 million tonnes in 2021**, although this was from a record low baseline in 2020. The increase was partly due to a fall in renewable electricity generation under less windy conditions and maintenance outages in nuclear plants. This was a temporary deviation from the prevailing downward trend in coal-fired electricity as the generation mix has shifted towards other fuels and the Government remains committed to phasing out coal-fired generation by October 2024.

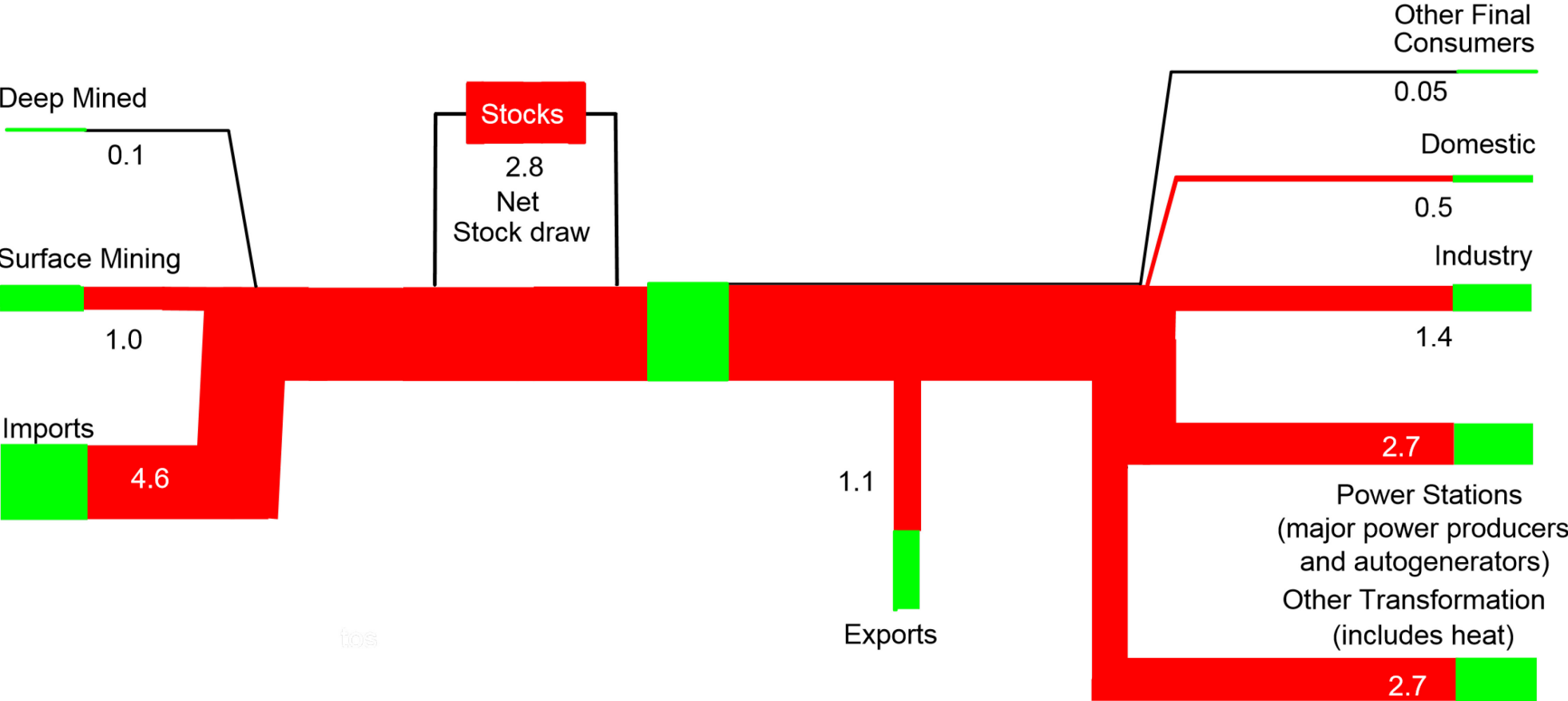
**Production of coal fell to another record low, down 37 per cent from 2020** to 1.1 million tonnes. Surface mining production fell to a record low of 1.0 million tonnes due to mine closures, production restrictions due to Covid-19 and flooding. In the last ten years, UK coal production has fallen by 94 per cent.

**Coal imports rose 1.7 per cent in comparison with 2020** to 4.6 million tonnes in 2021. Net imports accounted for 48 per cent of supply in 2021. Three countries accounted for 78 per cent of total coal imports: Russia (43 per cent), the USA (24 per cent) and Australia (11 per cent).

In 2021, coal comprised 2.8 per cent of UK energy demand, down slightly from 2.9 per cent in 2020 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 visualising 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 2021 (million tonnes)

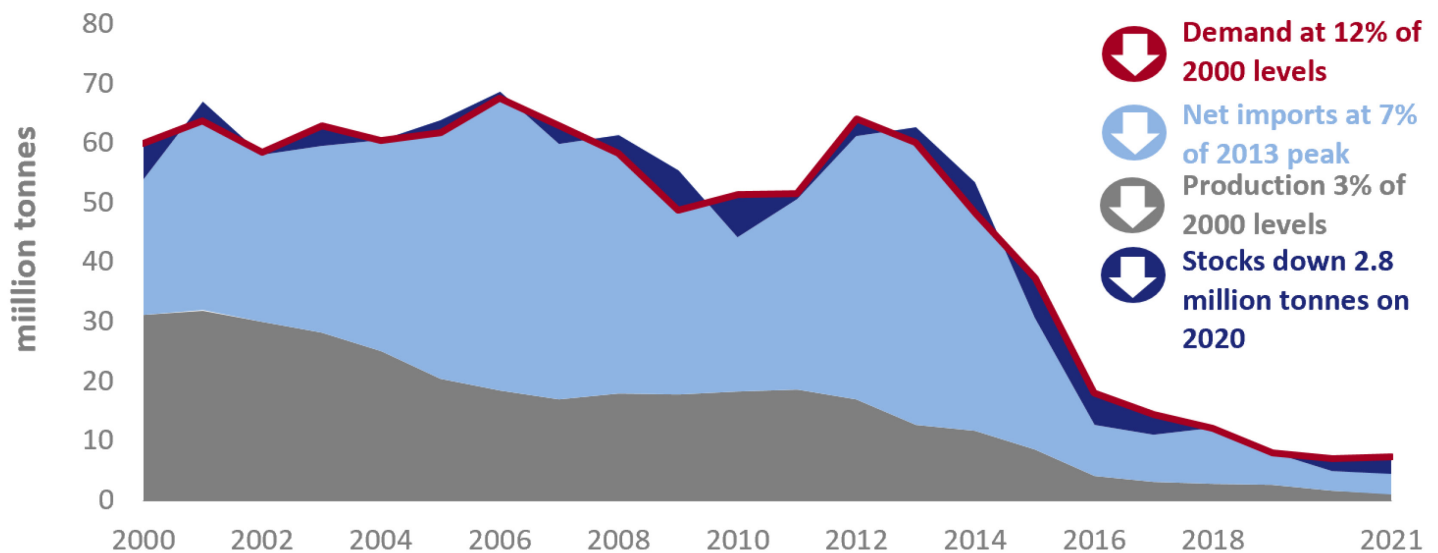


**Note:**

This flow chart is based on the data in Tables 2.1 and 2.2. 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 94 per cent in the past ten years.** In 2021, coal production fell to a record low of 1.1 million tonnes, down 37 per cent on 2020 (Chart 2.1). In that period 14 per cent of demand was met by domestic production, 48 per cent by net imports and 38 per cent was drawn from stocks.

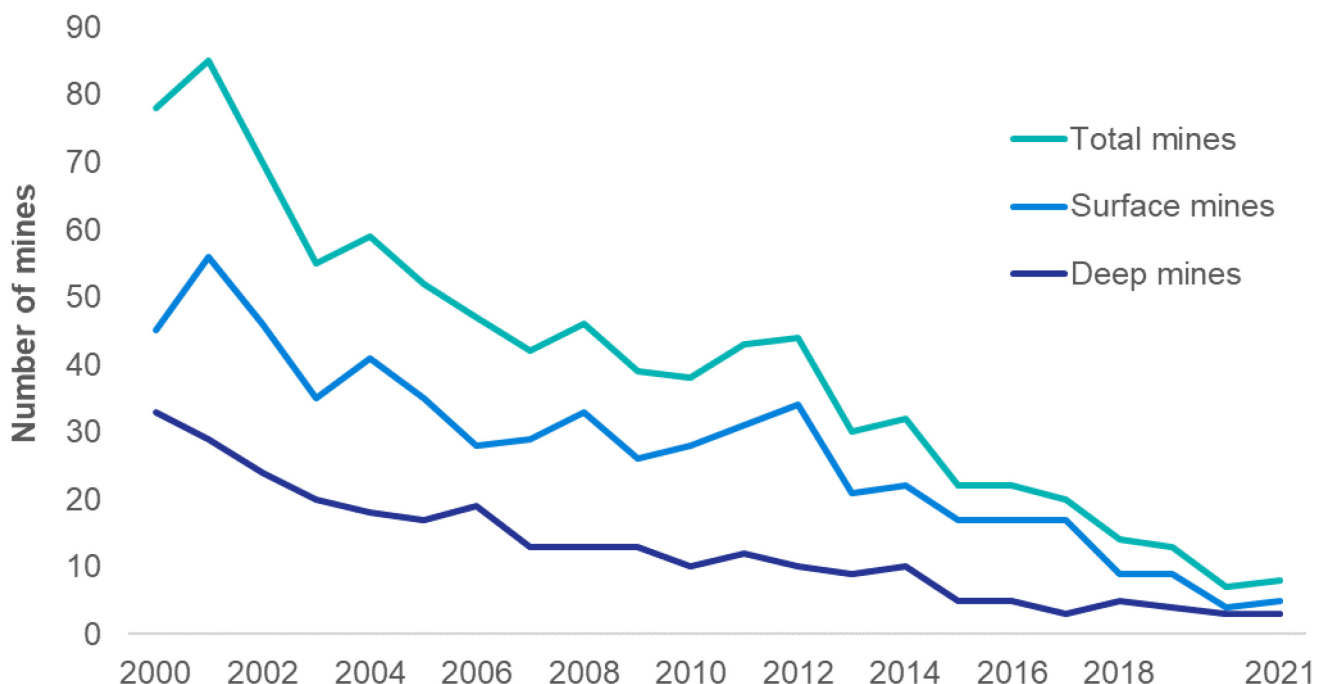
**Chart 2.1 UK coal supply and demand, 2000 – 2021** ([Table 2.1](#))



Deep mined production fell to 94 thousand tonnes, comprising 8.9 per cent of production in 2021. Eight deep mines remained open after one closed in 2021 and another was under care and maintenance. Five deep mines reported coal production in 2021. This compares to 2015 when deep mined production provided nearly a third of total coal production, and when the last three large deep mines closed – Hatfield, Thoresby and Kellingley.

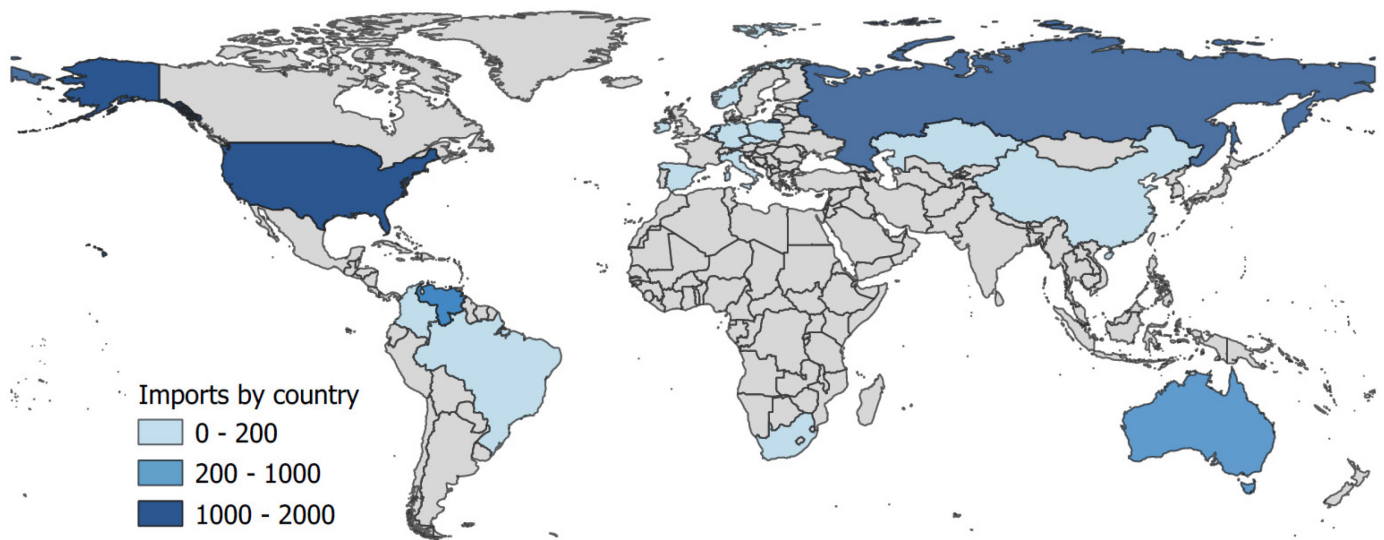
Surface mine production was down 39 per cent to a new record low of 1.0 million tonnes due to mine closures, production restrictions due to Covid-19 and flooding. Just three surface mines are still operating in the UK.

**Chart 2.2 Number of coal mines producing in the UK, 2000 – 2021** ([Table 2.5](#))



**Net imports of coal also fell substantially, down 93 per cent from the peak in 2013.** This is again a result of the sharp fall in demand for coal. In 2021, net imports rose by 7.9 per cent from 2020 levels to 3.5 million tonnes. This reduction in imported coal 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 2021 net imports accounted for 48 per cent of the UK's supply, up 10 percentage points from the proportion in 2000.

**Map 2A showing UK Coal Imports in 2021 (thousand tonnes)**



For more detail on coal imports and exports see [DUKES tables 2.7, 2.8](#)

Steam coal imports were 1.0 per cent higher at 2.4 million tonnes in 2021 compared to 2020. Russia was the largest provider of UK's steam coal (46 per cent), followed by the USA (16 per cent) and Venezuela (13 per cent). Steam coal accounted for 53 per cent of total coal imports. Coking coal imports were up 2.6 per cent at 2.1 million tonnes compared to 2020. The increase was mainly due to the 60 per cent rise 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 1.7 million tonnes in 2021, which was 62 per cent lower than in 2020.

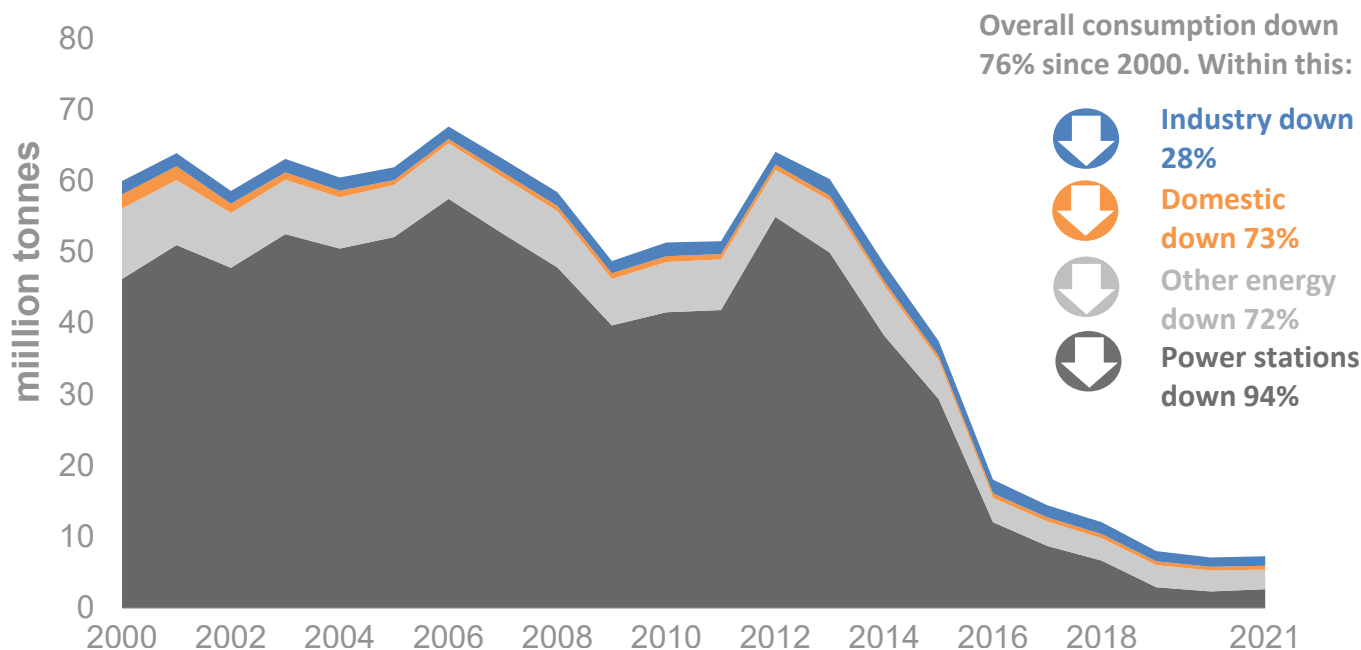
**As of June 2022, the Coal Authority estimates that overall there are 3,814 million tonnes of coal resources,** including prospects (Table 2.6). Of the economically recoverable and minable coal resource in current operations (including those in the planning or pre-planning process), 986 million tonnes is in underground mines and 46 million tonnes in surface mines. Overall England had an 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 2.6 gives details of the resource assessment by England, Scotland and Wales as at 21 June 2022.

**Demand for coal rose by 2.8 per cent to 7.3m tonnes in 2021, compared to 2020 (table 2.2).** Much of this increase was driven by the 14 per cent rise in coal-fired generation to 2.7 million tonnes, although this was from a low baseline following record periods without coal generation in Great Britain in 2020. Less favourable weather conditions for renewable generation alongside maintenance outages in nuclear plants contributed to the mild rise in coal use. This is a temporary deviation from the prevailing downward trend as the electricity generation fuel mix has shifted towards other sources of fuel as coal is being phased out. Final consumption by industry rose by 4.7 per cent, and transformation for coke manufacture and in blast furnaces fell by 6.3 per cent.

**Despite the increase in coal generation in 2021, the longer-term trend remains downwards.** A reduction in generation capacity contributed to the downwards trend in coal consumption. Most of the UK's coal-fired power plants have closed in recent years and the Drax coal units were mothballed at the end of March 2021, leaving just three coal plants operational in the UK. Coal use has declined since the early 1970's as new fuels (gas and renewables) entered the market and coal use for electricity generation is expected to cease completely by October 2024.

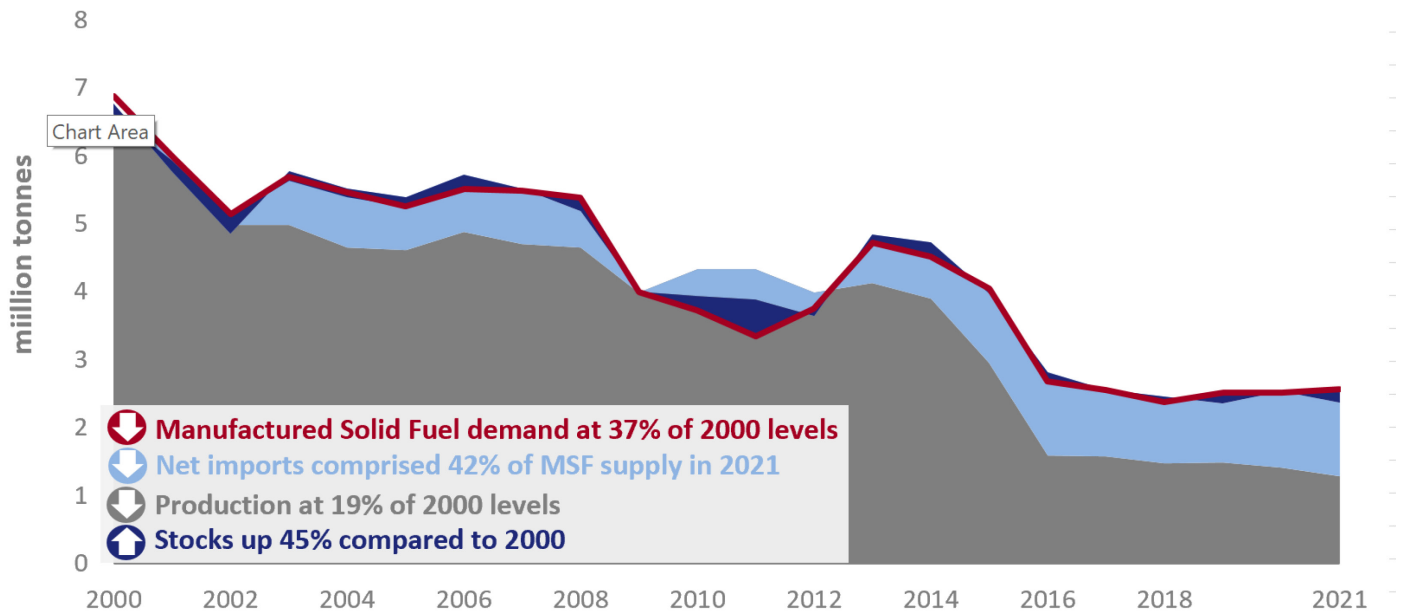
**Chart 2.3 Coal consumption, 2000 – 2021** ([Table 2.2](#))



The iron and steel industry is one of the main non-generation users of coal, for coke manufacture, blast furnaces and direct consumption. In 2021 it used 2.6 million tonnes of coal, half of what it used in 2015 (5.2 million tonnes). In terms of total share, it comprised 36 per cent of UK coal consumption in 2021, up from 14 per cent in 2015.

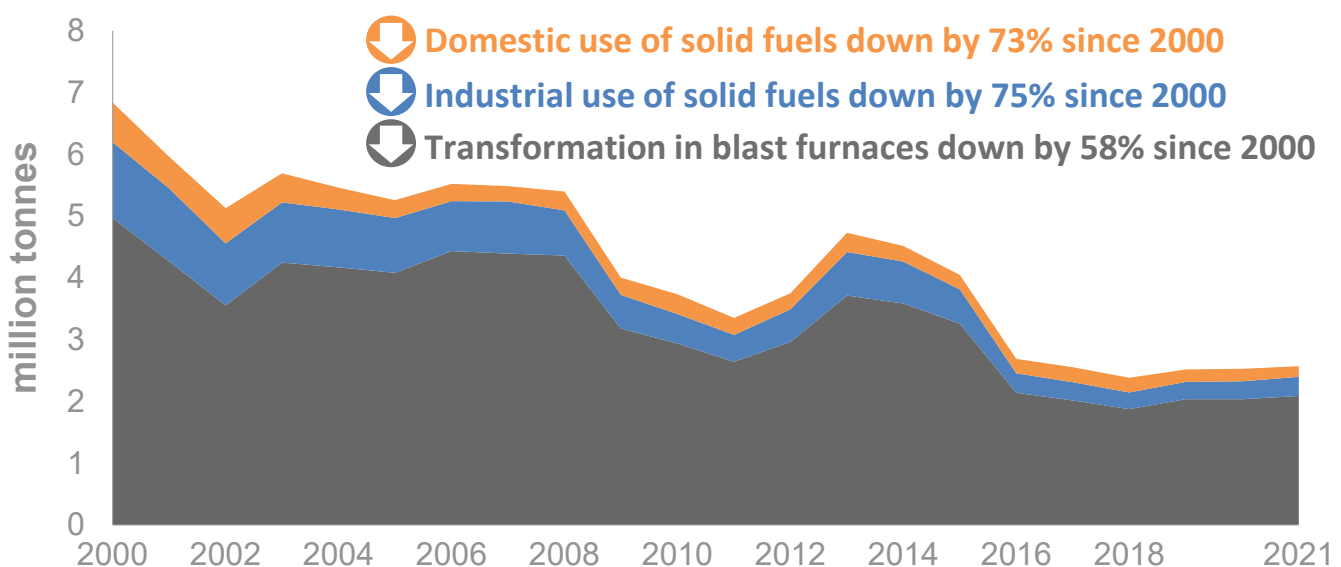
In addition to coal production and consumption, the UK has significant (but decreasing) supply and demand for a range of manufactured solid fuels that are used for domestic, industrial and transformation processes. Coke is the solid product obtained from the carbonisation of coal, principally coking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

**Chart 2.4 Total manufactured solid fuels supply and demand, 2000 - 2021 (Table 2.3)**



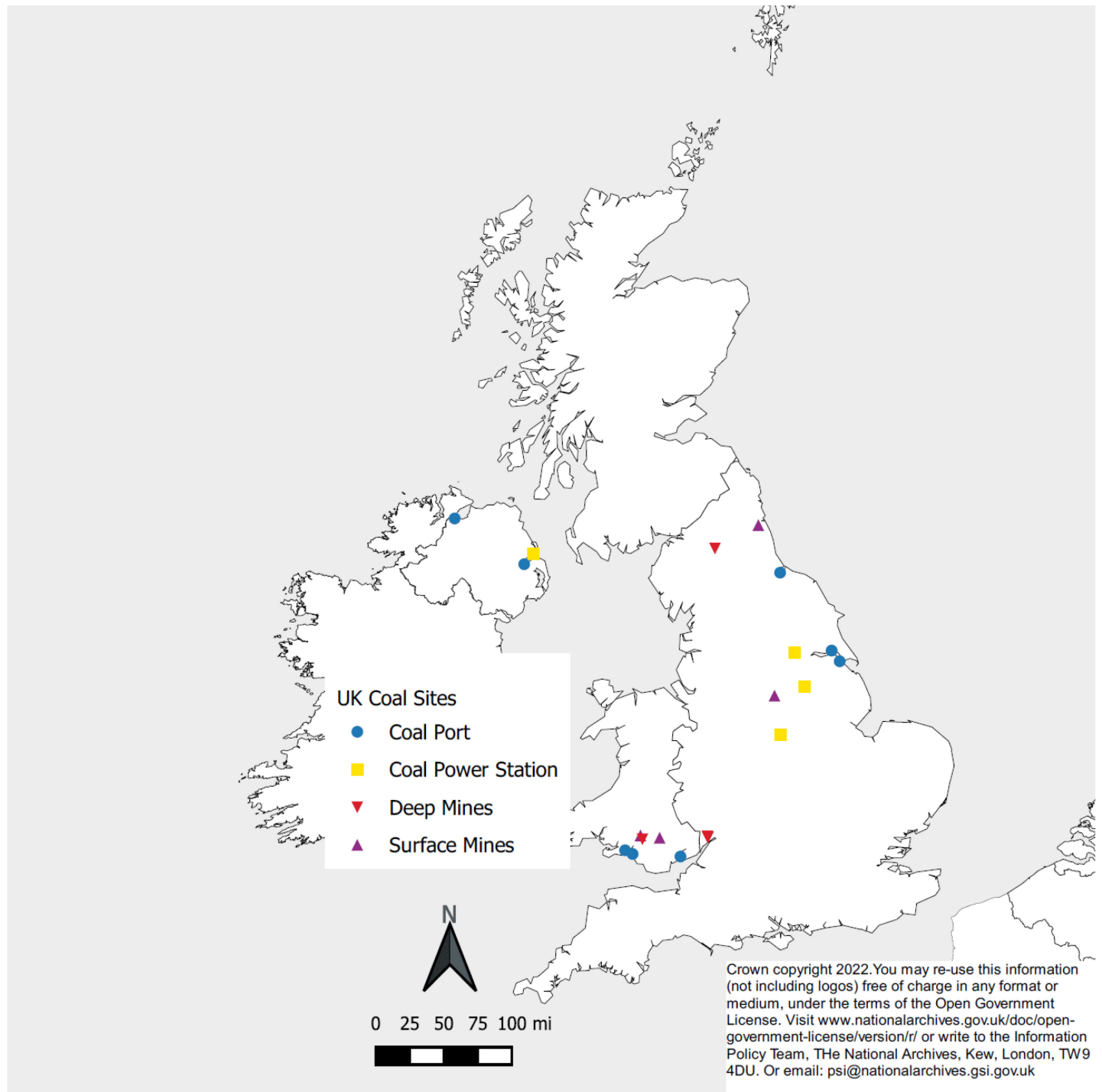
In 2021, indigenous coke oven coke fell by 8.2 per cent to 1.1 million tonnes compared to 2020 (Chart 2.5). It has been relatively stable in the last four years. Monckton Coke and Chemicals, the only dedicated coke plant in the UK closed in December 2014. There has been a fall in steel production in the UK since 2015. Notably, SSI steelworks at Redcar ceased production in mid-September 2015 (with the subsequent closure in October). Coke production continues at other sites and is used at steelworks, mainly Port Talbot and Scunthorpe. Coke breeze production fell 3.9 per cent to 15 thousand tonnes. Other manufactured solid fuels (patent fuels) fell by 14 per cent to 171 thousand tonnes.

**Chart 2.5 Total manufactured solid fuels consumption in the UK, 2000 – 2021 (Table 2.3)**



In 2021, coke oven coke comprised 74 per cent of demand for manufactured solid fuels, with coke breeze at 19 per cent and other manufactured solid fuels at 7 per cent. Almost all coke oven coke and coke breeze in the UK is used in blast furnaces for steelmaking. Volumes have been broadly stable in recent years.

## Map 2B Location of UK coal production sites and ports as at end 2021





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