Chapter 3: Oil and Oil Products

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Key headlines

Oil formed 38 per cent of total energy demand in 2022. Following the upward trend since lows in 2020, demand for petroleum products increased by 10 per cent in 2022 compared to 2021. Much of this growth came from the transport sector, with road fuels accounting for a fifth of all UK energy demand in 2022.

In 2022, UK production of primary oils fell to an all-time low at 38 million tonnes. This was 8 per cent lower than in 2021 and the UK continued being a net importer of primary oils, at 16 million tonnes, the highest since 2015. Low production was a result of several factors, including extensive summer maintenance, and in 2022 the UK had record low crude oil exports.

Refinery production increased by 12 per cent on last year at 54 million tonnes. However, this remains half of the peak production in 1998.

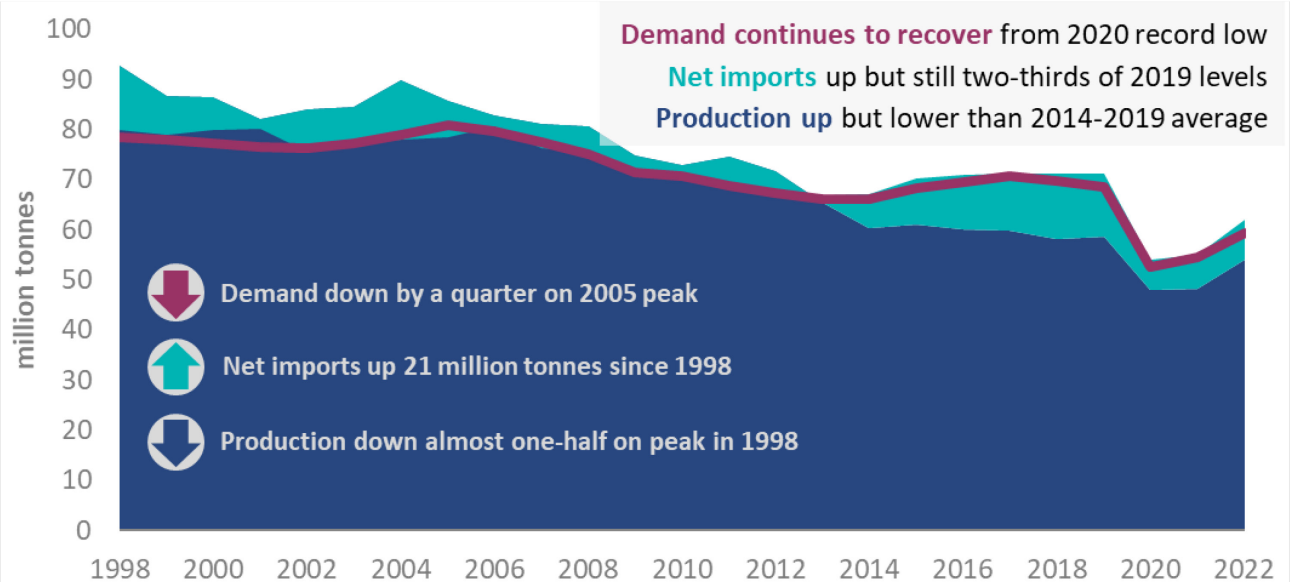
Oil product demand grew by 9.2 per cent in 2022, with trends mixed by sector. Whilst overall industry demand fell, the sectors most impacted by the Covid-19 pandemic saw increases in demand. The food and beverage industry increased by 11 per cent as more people ate out, car fuel use increased by 3.3 per cent, and jet fuel demand doubled as people travelled more.

The commercial sector increased by 5.8 per cent on 2021, but domestic consumption decreased by 4.0 per cent due to warmer conditions. Despite the increased productivity in 2022, the agricultural sector saw a decrease in demand of 3.3 per cent. This was due to the increase in energy cost which saw a decrease in use of fertiliser, a product which is energy intensive to produce.

Jet fuel demand doubled in 2022 compared to 2021, when it was at its lowest point since 1983 following the Covid-19 pandemic restrictions. Most global restrictions on international travel had been lifted by the start of 2022, causing an increase in demand for flights. However, demand remains down over a fifth compared to pre-pandemic levels.

The UK held 8.7 million tonnes of oil stock, which is the equivalent of over 188 days of net imports, exceeding the 90 days required by the International Energy Agency (IEA). **UK stocks of oil decreased by 13 per cent compared to 2021** to a record annual low following an IEA-coordinated release of oil stocks in March and April 2022 due to the Russian invasion on Ukraine.

Chart 3.1 Supply and demand for petroleum products, 1998 – 2022 (DUKES Table 3.2)

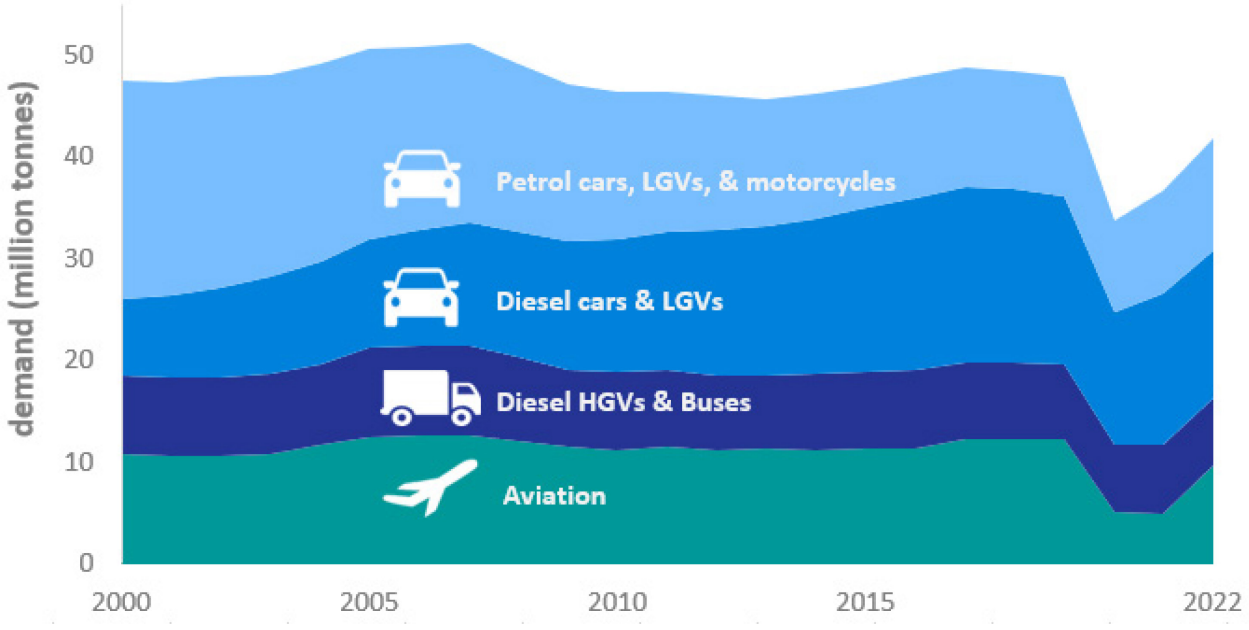


In 2022, total demand for petroleum products increased by 10 per cent on 2021 (total demand includes energy industry use and transformation). Much of this growth was from an increased demand in the transport sector, which was up 15 per cent on 2021, as demand for key road fuels increased and jet fuel demand doubled due to a year of no Covid-19 restrictions.

In 2022, refinery production was up 12 per cent compared to 2021, at 54 million tonnes, but nearly halved since peak production in 1998[1]. This is below the average of around 60 million tonnes between 2014 and 2019. Whilst demand increased refinery production remained low for several reasons including significant maintenance in the summer of 2022.

The UK remained a net importer of products at 7.9 million tonnes in 2022, 1.1 million tonnes higher than in 2021. The UK became a net importer in 2013 and had peak net imports in 2018 at 13 million tonnes. Overall, product imports and exports increased in 2022 by 16 and 15 per cent respectively compared to 2021.

Chart 3.2 Annual demand for transport fuels since, 2000 - 2022[2]

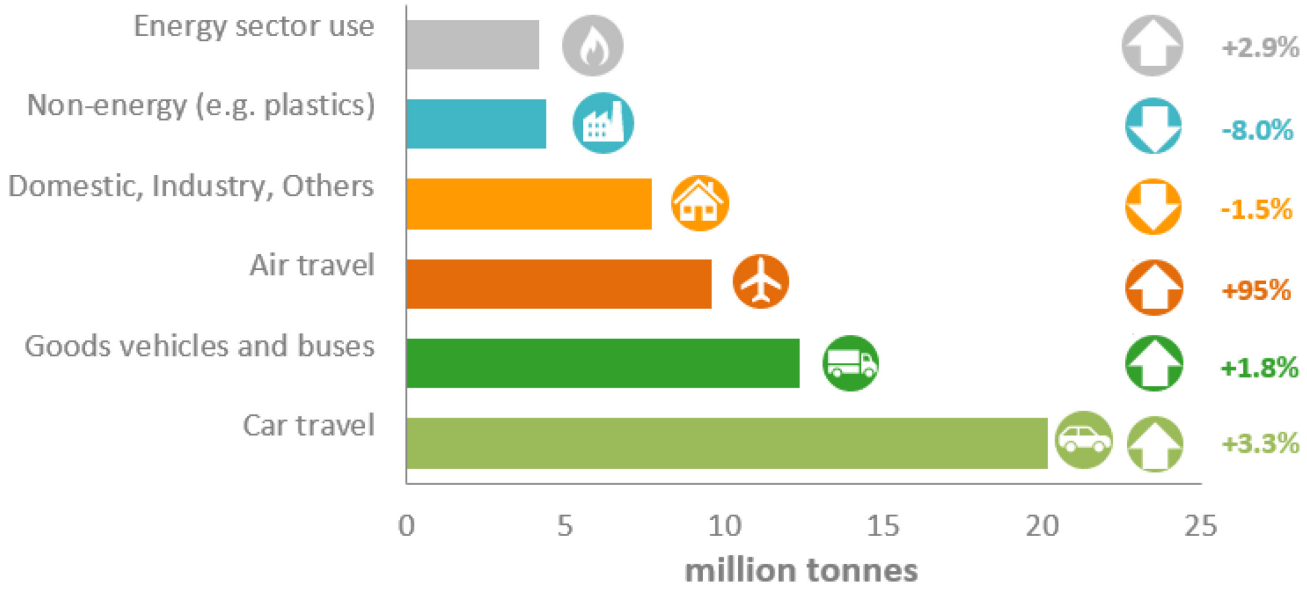


[1]See Annex 2 for a map and further detail on UK refinery nameplate capacities in the methodology note.
[2] See UK Energy in Brief for detailed breakdown of fuel consumption by vehicle type.

The transport sector is the primary use for petroleum products in the UK, in 2022, accounting for almost three quarters of product demand. Demand for petrol increased by 7.7 per cent and diesel remained stable compared to 2021. Overall fuel use by cars has increased by 2.5 per cent in 2022 and heavy good vehicles and bus fuel demand has remained stable[2].

Demand for jet fuel doubled in 2022 compared to 2021, reflecting the increase in demand for international travel. Whilst 2021 saw some Covid-19 international travel restrictions, most international restrictions had been lifted for the whole of 2022. Demand for jet fuel reached 9.6 million tonnes, up on the 4.9 million tonnes in 2021, which was the lowest level since 1984. However, demand is still down 22 per cent compared to pre-pandemic levels in 2019.

Chart 3.3 Oil consumption in the UK, 2022 (DUKES Table 3.2)



Oil consumption trends in 2022 were mixed across sectors, despite the 9.2 per cent increase in total oil product demand. In 2022 most minor sectors saw a decrease in oil consumption, but this was countered by a larger increase in demand in sectors such as energy use, including petroleum refineries, oil and gas extraction, and transport. Whilst overall industrial consumption fell, there were increases in some sectors such as the food and beverage sector (up 11 per cent), and construction (up 5.8 per cent). Chemical industry use was down by 9.8 per cent because plants have closed, and production has been halted at several sites following maintenance. Vehicle manufacturing has been impacted by supply chain issues, specifically the global shortage of computer chips, as well as factory closures, leading to a 4.0 per cent fall in energy used.

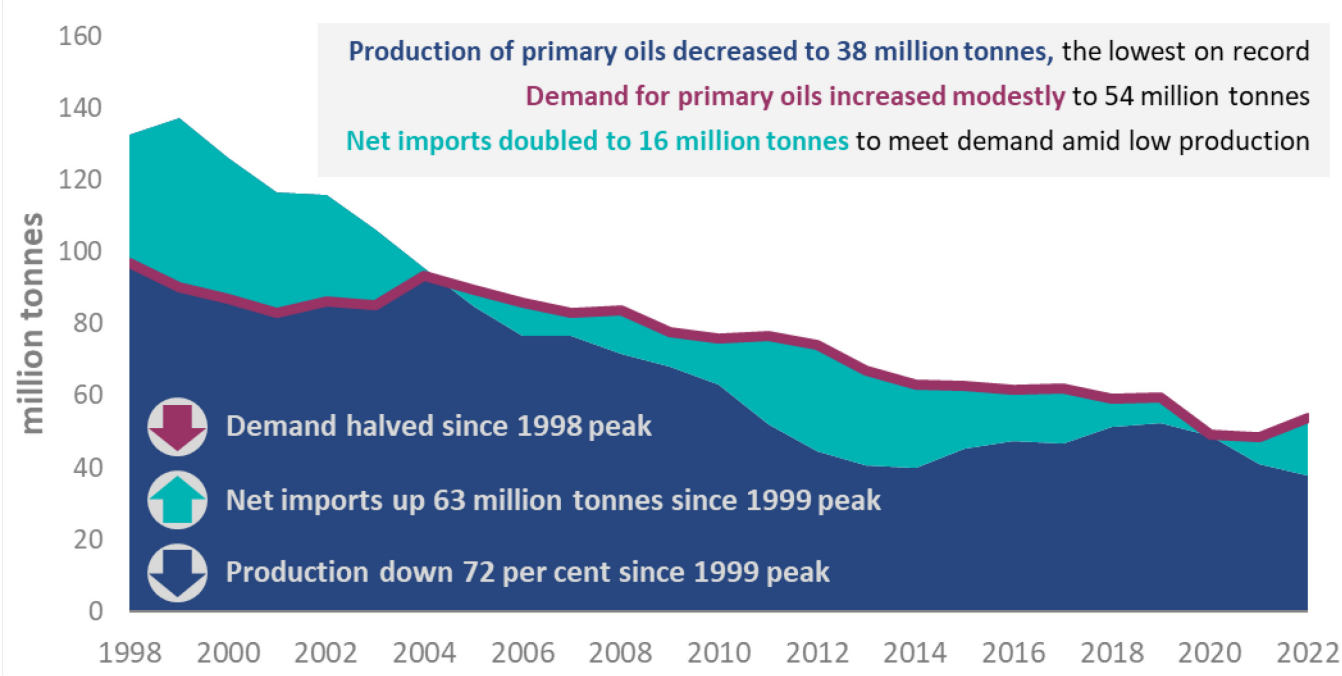
In 2022, demand for oil by the commercial sector increased by 5.8 per cent compared with 2021. This reflects the lack of operating restrictions on UK businesses in 2022 compared to 2021 where there were restrictions due to Covid-19 in the first half of the year. Despite favourable growing conditions for cereals and other crop products, the agricultural sector saw a decrease in demand of 3.3 per cent due to an increase in energy prices which impacted fertiliser sales[3]. In 2022, domestic consumption decreased by 4.0 per cent, in line with warmer temperatures (Energy Trends Weather Statistics).

In 2022, non-energy use of oil products was down by 8.0 per cent, following the sharp decrease also seen last year. While non-energy demand for propane and butane remains relatively stable, demand for naphtha remains supressed, and in 2022 ethane fell by 38 per cent to 375 thousand tonnes. Reduced demand for

[3] see DEFRA Total Factor Productivity Statistics

these petrochemical feedstocks is the result of a 2-year closure of a major plant at Teesside, which has now attracted investment for it to run on hydrogen following national and international Net Zero policies[4].

Chart 3.4 Supply and demand for primary oils, 1998 – 2022 (DUKES Table 3.1)



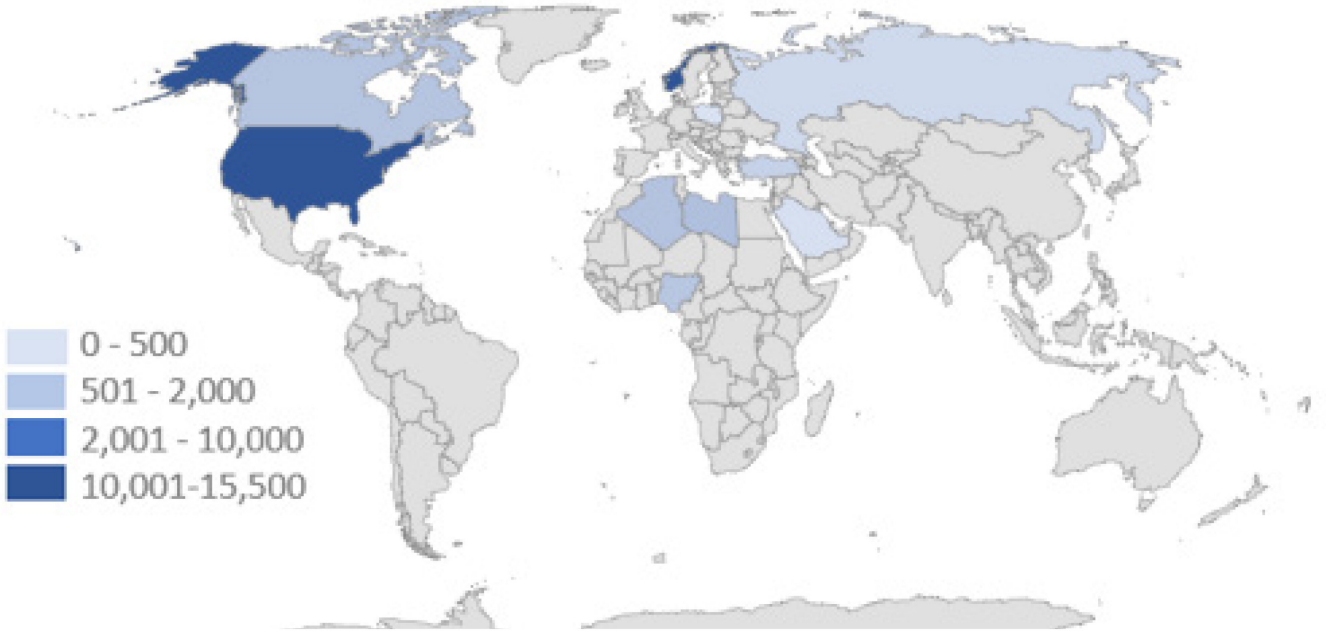
In 2022, UK production of primary oils fell to an all-time low at 38 million tonnes, this was 8 per cent lower than in 2021. Contributing factors included extensive summer maintenance in 2022 which reduced production volumes for the remainder for the year.

Demand for primary oils increased by 12.4 per cent compared to 2021. Due to continued low production and refinery maintenance, exports decreased by 10 per cent to 31 million tonnes, compared to peak exports of 90 million tonnes in 2000. Imports increased by 12 per cent on 2021 to help meet demand. The UK returned to being a net importer of primary oils at 16 million tonnes, the highest net imports of primary oil since 2015.

In 2022, refineries took receipt of 7.1 million tonnes of crude produced from the UK Continental Shelf (UKCS), meeting 13 per cent of refinery demand. (see Energy Trends Table 3.10). The UK is reliant on imports to meet refinery demand for specific crude types.

[4] Sabic, Annual Report 2021 https://www.sabic.com/en/reports/annual-2021/strategic-report/future-plans-and-investment

Map 3A Sources of UK crude oil imports 2022 (thousand tonnes, DUKES Table 3.7)



Crude oil imports increased by 16 per cent in 2022 compared with 2021, as demand for oil increased and production decreased. Crude import levels remain 4.5 per cent lower than pre-pandemic levels in 2019.

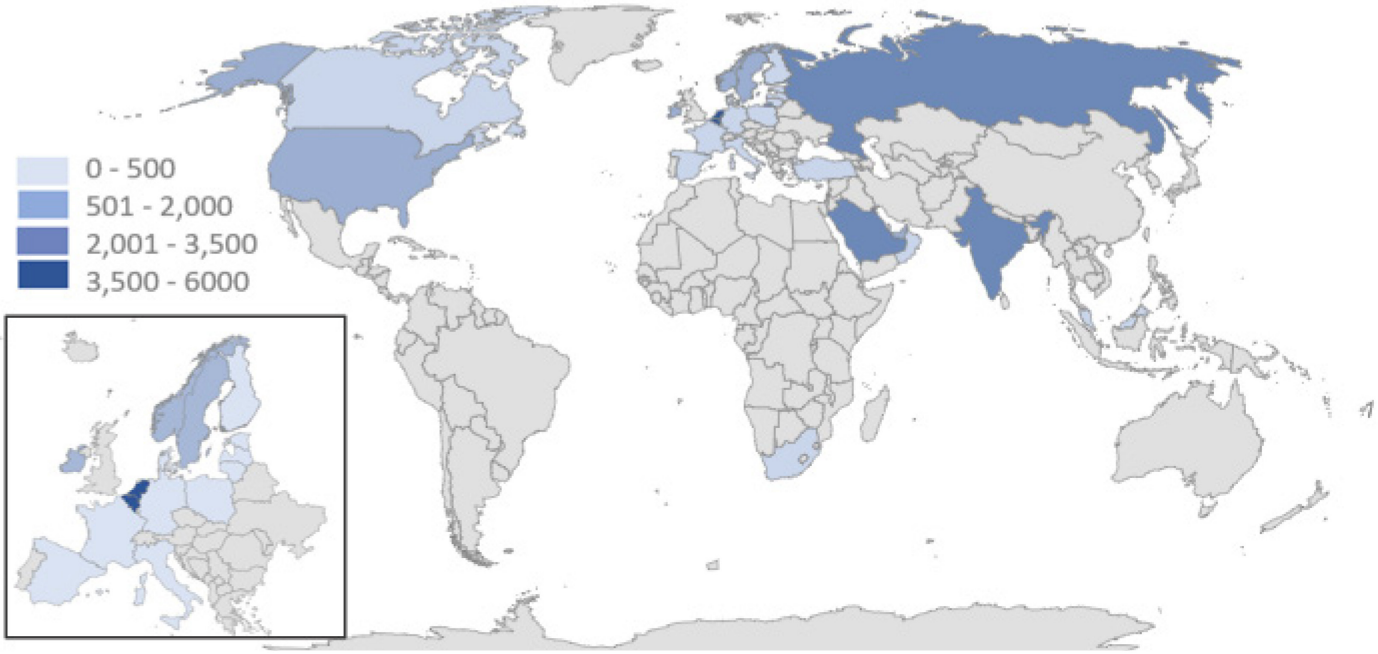
In 2022, the United States overtook Norway as the UK's largest crude import source. Imports from the United States were up 37 per cent on 2021, as global oil trade reconfigured itself to replace Russian oil imports due to sanctions introduced at the end of 2022 following Russia's illegal invasion of Ukraine. Crude imports from the United States accounted for over a third of all crude oil imports in 2022.

Norway was the second largest import source of crude due to its proximity and shared infrastructure in the North Sea. Imports of crude from Norway were up 5.6 per cent compared with 2021, accounting for a third of total crude imports. However, Norway's share of crude imports has decreased in recent years from the high of 62 per cent in 2016.

Prior to the ban against Russian oil introduced on 5th December 2022, importers sought different crude sources. Russian crude oil imports dropped by 82 per cent in 2022 and made up only 1.2 per cent of crude imports in 2022 compared with 7.7 per cent in 2021.

Imports from current OPEC countries have decreased following the peak in 2013 and accounted for 15 per cent of the UK's crude imports in 2022, decreasing by 5.3 per cent on 2021. The UK exports a substantial amount of crude oil, however this decreased by 10 per cent in 2022 compared with 2021, in line with reduced production (Table 3.8).

Map 3B Sources of UK petroleum product imports 2022 (thousand tonnes, DUKES Table 3.7)

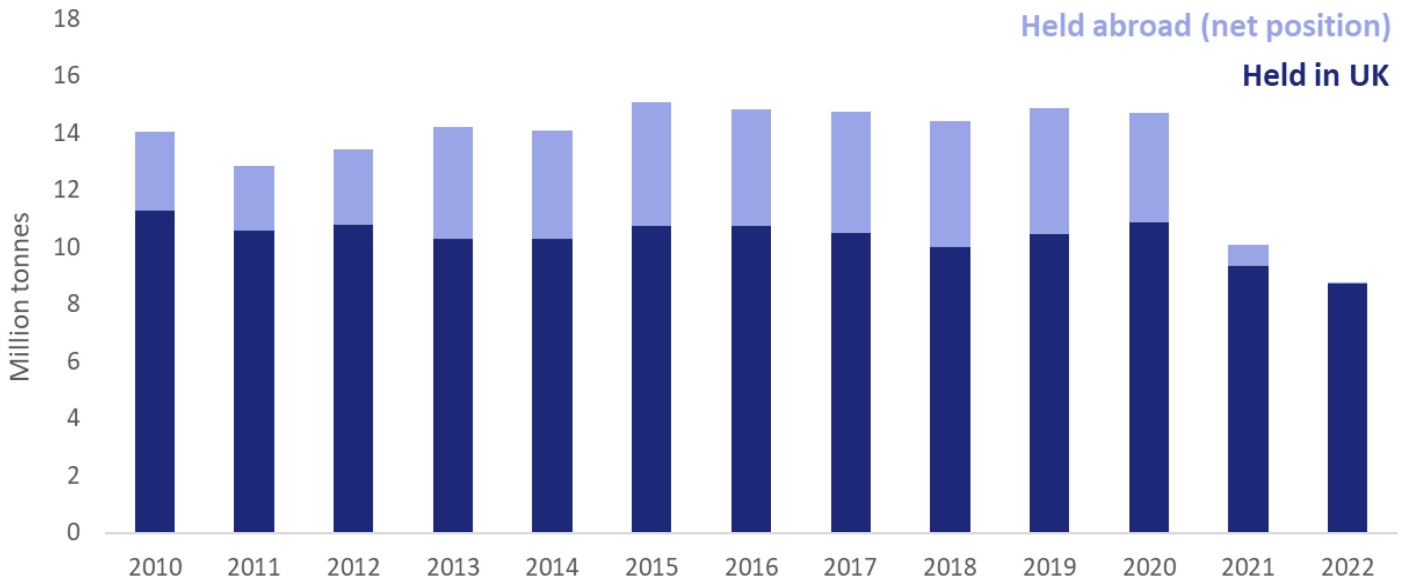


Map 3B shows UK imports of petroleum products by source in 2022. **The Netherlands is a major oil trading hub and as such is the principal source of product imports for the UK.** Whilst the Netherlands remained the largest import source of products at 19 per cent, Belgium was the second largest import source, representing 13 per cent of product imports, replacing Russia who was second largest in 2021. Russian imports have dropped from 22 per cent of the total imports to 6.8 per cent in 2022 and decreased to zero by the end of the year. Indian imports have more than doubled as importers find new sources of petroleum products.

Imports of petroleum products increased 16 per cent in 2022 compared to 2021, reflecting the increase in demand and decrease in production. Diesel held the largest share of product imports, making up 46 per cent of the total product imports and quantities have increased by 10 per cent on 2021. Russia was a major import source for diesel before the invasion of Ukraine, making up over a third of diesel imports in 2019. In 2022, Russia made up only 15 per cent of diesel imports ahead of the ban implemented in December, and subsequently indigenous production of diesel increased by 14 per cent in 2022 compared to 2021. Petrol imports increased by 4.1 per cent in 2022.

Imports of jet fuel, the second largest share of product imports, increased by 78 per cent in 2022 as demand for international travel continued to recover. Jet fuel made up a quarter of all product imports in 2022, as demand for jet fuel doubled in the UK. The main imports source for jet fuel were Gulf Cooperation Council countries such as Kuwait, United Arab Emirates, and Saudi Arabia.

Chart 3.5 UK oil stocks, 2010 – 2022 (DUKES Table 3.5)



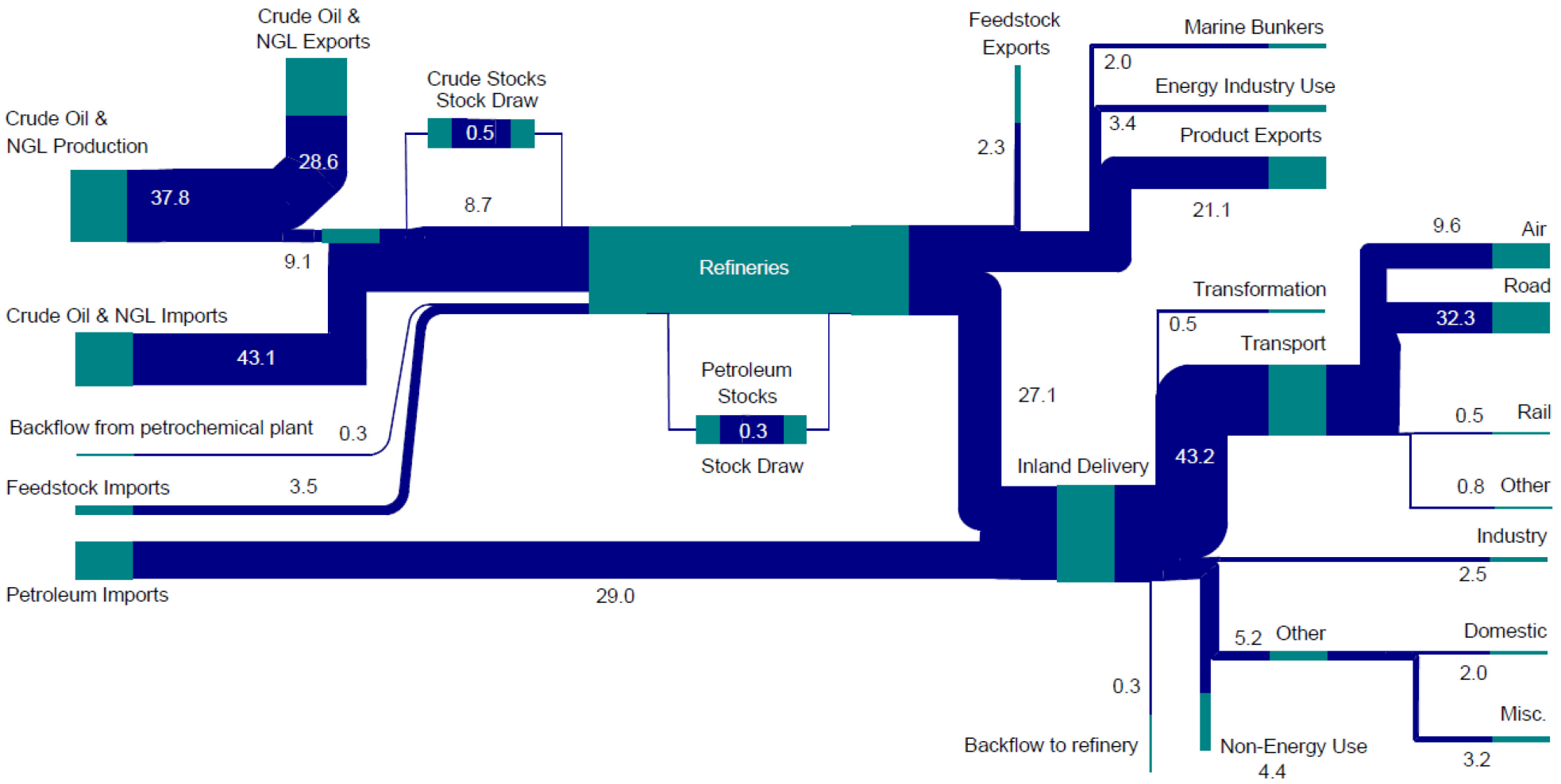
The UK government is required to hold stocks of oil which can be released in the event of severe disruption to global supply. The UK receives this obligation as a member of the International Energy Agency (IEA) and meets the obligation by directing companies to hold minimum levels of stocks. In March and April 2022, the UK participated in an IEA co-ordinated release of oil stocks in response to Russia's invasion of Ukraine. This led UK obligations to be lowered by 6.6 million barrels. Prior to this, the UK has released stocks following agreement between IEA Members only three times: in the lead up to the Gulf War in 1991; following the impact of Hurricanes Rita and Katrina in the US in 2005; and during civil disruption in Libya in 2011.

At the end of 2022, the UK held 8.7 million tonnes of stocks (DUKES Table 3.5) the equivalent of 188 days of net imports, which is substantially higher than the required 90 days of net imports set by the IEA. However, this represented a record annual low as the UK released oil stock as part of the IEA's collective actions. Companies may choose to hold stocks within the UK or abroad via legal agreements with other countries. A large component of the fall in UK stock was the release of volumes held elsewhere in Europe.

The record annual low in 2022 followed a previous fall in stock levels between 2020 and 2021. This reflected the UK's move from being obligated to hold stocks as a member of both the IEA and European Union (EU), to holding stocks as a member of the IEA only. The IEA stocking obligation is historically lower than that of the EU, as it is based on imports rather than consumption. As such companies were directed to hold less stock. For further details and more recent data, please see Energy Trends Table 3.11.

The flow chart below shows the movement of primary oils (on the left) into refineries which are then transformed and consumed by various sectors of the UK economy (on the right), in addition to trade. The widths of the bands are proportional to the size of the flow they represent.

Petroleum flow chart 2022 (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.

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