Chapter 3: Oil and Oil Products

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Key headlines

In 2023, UK production of primary oils fell another 11 per cent to an all-time low of 34 million tonnes, continuing the ongoing pattern of decline from the mature North Sea basin and resulting in new record low exports. Net imports of primary oils increased by 15 per cent to 18 million tonnes.

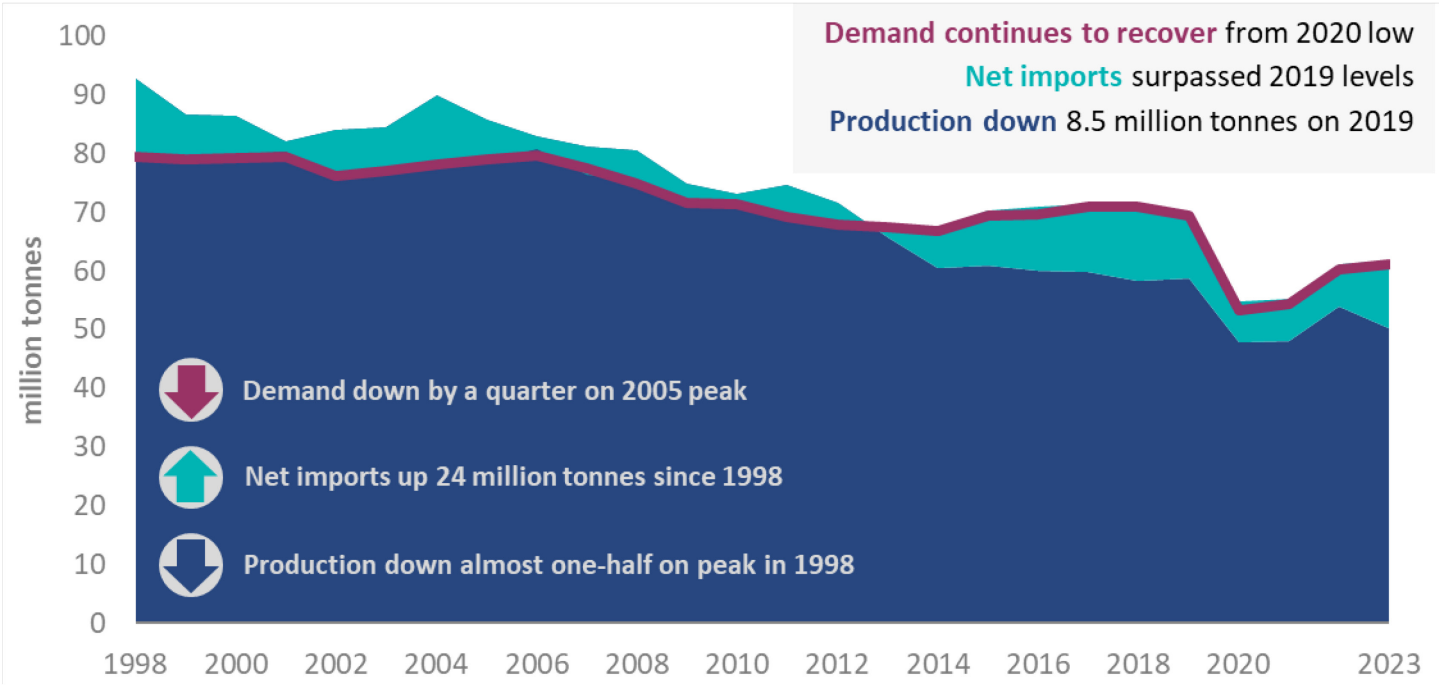
Refinery production decreased by 6.9 per cent on 2022 to 50 million tonnes, around half of the peak production in 1998. The UK was a net importer of products by 11.5 million tonnes in 2023, up by 60 per cent on 2022 and the third highest figure since the UK became a net importer in 2013.

Oil formed 39 per cent of total energy demand in 2023, with overall demand for products up by 1.6 per cent compared to 2022. As air travel continues its recovery following Covid-19, aviation demand saw an annual increase of 16 per cent but at 11 million tonnes remained 8.2 per cent lower than levels in 2019 before the Covid-19 pandemic. Domestic sales increased by 8.4 per cent while industry, commercial, and agriculture demand remained stable.

The UK held 9.6 million tonnes of oil stocks, the equivalent to around 140 days of net imports and exceeding the 90 days required by the International Energy Agency (IEA). **UK oil stocks increased by 10 per cent compared to 2022** as stocks were re-built from a record annual low in 2022 following an IEA-coordinated release of oil stocks in March and April 2022 due to the Russian invasion of Ukraine.

In 2023, total demand for petroleum products increased by 1.6 per cent on 2022 (total demand includes energy industry use and transformation). Much of this growth was from an increased demand in transport, which was up by 1.1 million tonnes (2.7 per cent) in 2023. Demand for jet fuel and petrol increased by 16 per cent and 4.4 per cent, respectively, while diesel demand for road use dropped by 4.2 per cent.

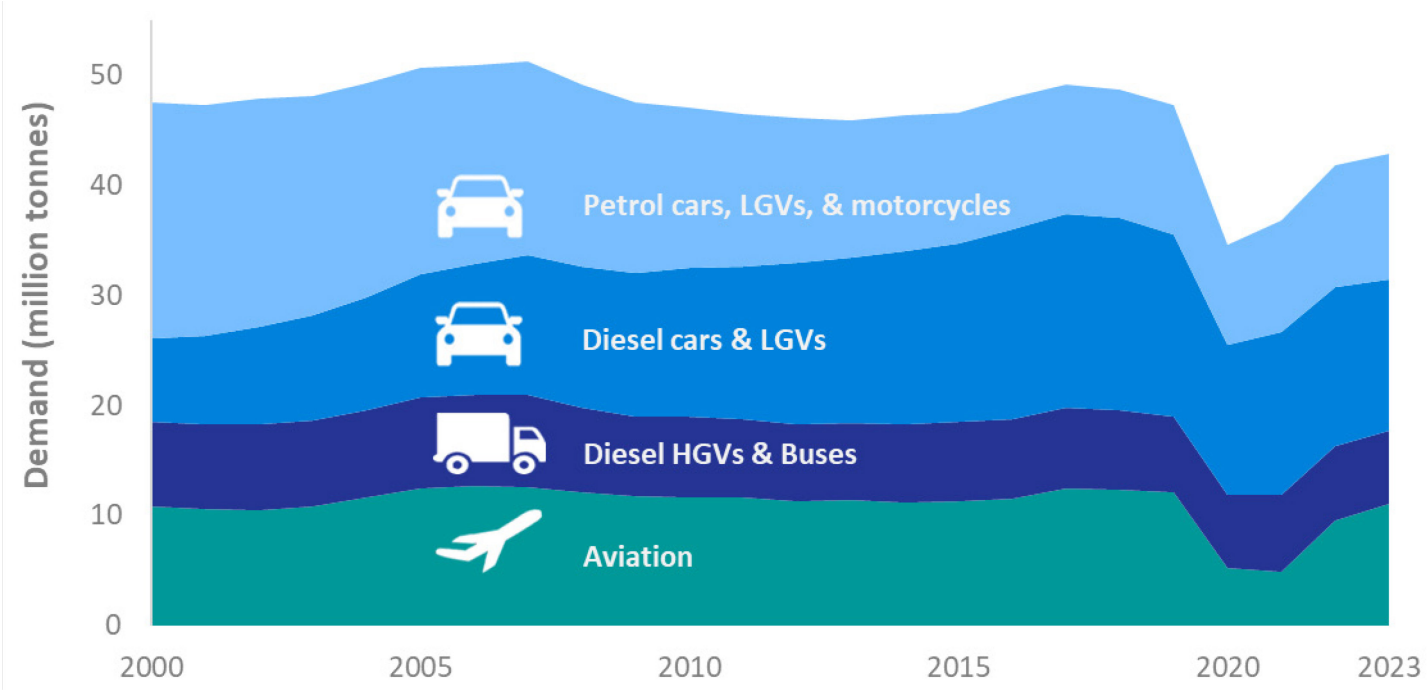
Chart 3.1 Supply and demand for petroleum products, 1998 – 2023 (DUKES Table 3.2)



Refinery production was down 6.9 per cent compared to 2022 at 50 million tonnes, half of the peak production seen in 1998[1]. This is below the average of around 60 million tonnes seen between 2014 and 2019 and remained low partially because of significant maintenance at the end of 2023.

The UK remained a net importer of products at 11.5 million tonnes in 2023, an increase of 60 per cent on 2022. This is the first time that net imports have risen above 10 million tonnes since pre-pandemic 2019 and, at the third highest level on record, surpassed the 5-year pre-pandemic average by around 2.1 per cent. The UK became a net importer in 2013 and had peak net imports in 2018 at 13 million tonnes. Overall, in 2023 product imports increased by 7.5 per cent and exports decreased by 10 per cent compared to the previous year.

Chart 3.2 Annual demand for transport fuels since, 2000 - 2023[2]



Petroleum products are mainly used for transport in the UK, with transport accounting for almost three quarters of product demand in 2023. Within transport, almost three quarters of demand was for road fuels. Demand for all transport fuels dipped during travel restrictions put in place to curb the spread of Covid-19; from 2019 to 2020, transport demand dropped by 13 million tonnes and petrol demand dropped below 10 million tonnes for the first time since 1970. Since 2020, transport fuel has recovered by almost a quarter, but remains 9.4 per cent down on pre-pandemic 2019.

Almost half of transport fuel demand is accounted for by diesel vehicles. Despite this, the trend over the last three decades of increasing diesel demand looks to be reversing. From 2000 to 2017, demand from diesel vehicles increased by 63 per cent. From 2017 to 2023, demand fell by almost a fifth. This is likely due to motorists switching to other transportation types, such as electric vehicles, due to environmental concerns.

Demand for jet fuel increased by 16 per cent in 2023 compared to 2022, reflecting the continuing recovery of air travel after Covid-19. Demand for jet fuel reached 11.1 million tonnes, which was 8.2 per cent below the pre-pandemic levels of 2019 but twice that seen during the pandemic years of 2020 and 2021 when demand was at the lowest since 1984.

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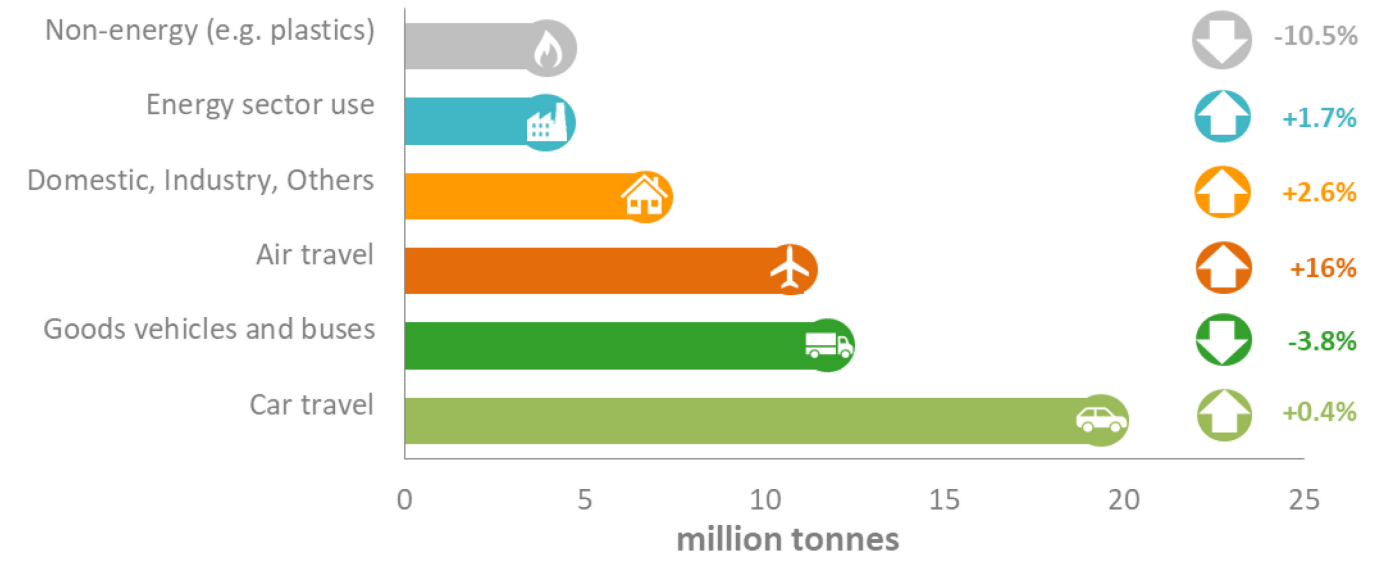
[1] See Annex 2 for a map and further detail on UK refinery nameplate capacities in the methodology note
[2] See UK Energy in Brief for detailed breakdown of fuel consumption by vehicle type

Chart 3.3 Oil consumption in the UK, 2023 (DUKES Table 3.2)



Demand for petroleum products in 2023 increased overall by 1.6 per cent with increases in most sectors.

Most notably sales of heating oil to households (domestic demand) were up by 8.4 per cent despite temperatures being comparable to the year before. Domestic demand for heating oil, which is typically purchased in bulk for extended use, has fluctuated in recent years primarily due to price changes rather than temperature variations. In 2020, low prices prompted many households to refill their tanks, resulting in a 4.6 per cent decrease in deliveries the following year. Demand dropped further in 2022, by one-fifth, as prices surged post-Ukraine invasion and the UK experienced record temperatures. However, with a one-fifth price reduction in 2023, demand rebounded by 8.4 per cent.

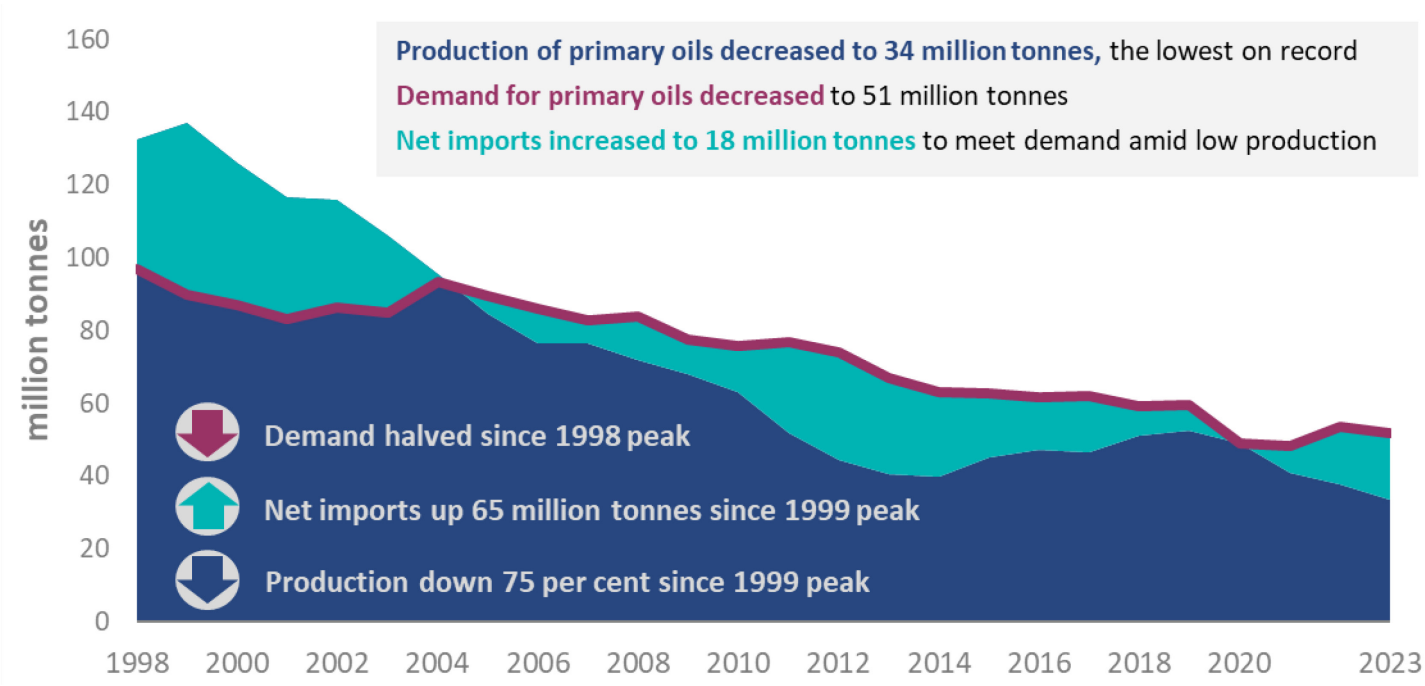
Industry demand remained relatively stable, up just 0.6 per cent, with commercial and agricultural demand also stable compared to 2022. Non-energy use was down by 11 per cent. Petrochemical sector demand for naphtha remains low, since the closure of the plant at Teesside that has now attracted investment for it to run on hydrogen[3].

Offshore production in 2023 reached a new record low of 34 million tonnes, down 11 per cent on 2022. The overall trend in production is one of continued decline over time from this mature basin, with 2023 production at just a quarter of the peak in 1999.

Demand for primary oils fell by 7.0 per cent compared to 2022 due to continued low refinery production and extensive refinery maintenance. Exports of primary oils fell by 11 per cent to a new record low of 27.7 million tonnes, a third of the peak exports of 93 million tonnes in 2000. Imports of primary oils fell by 2.1 per cent in 2023 but the UK remained a net importer of primary oils at 18 million tonnes, the highest level since 2014.

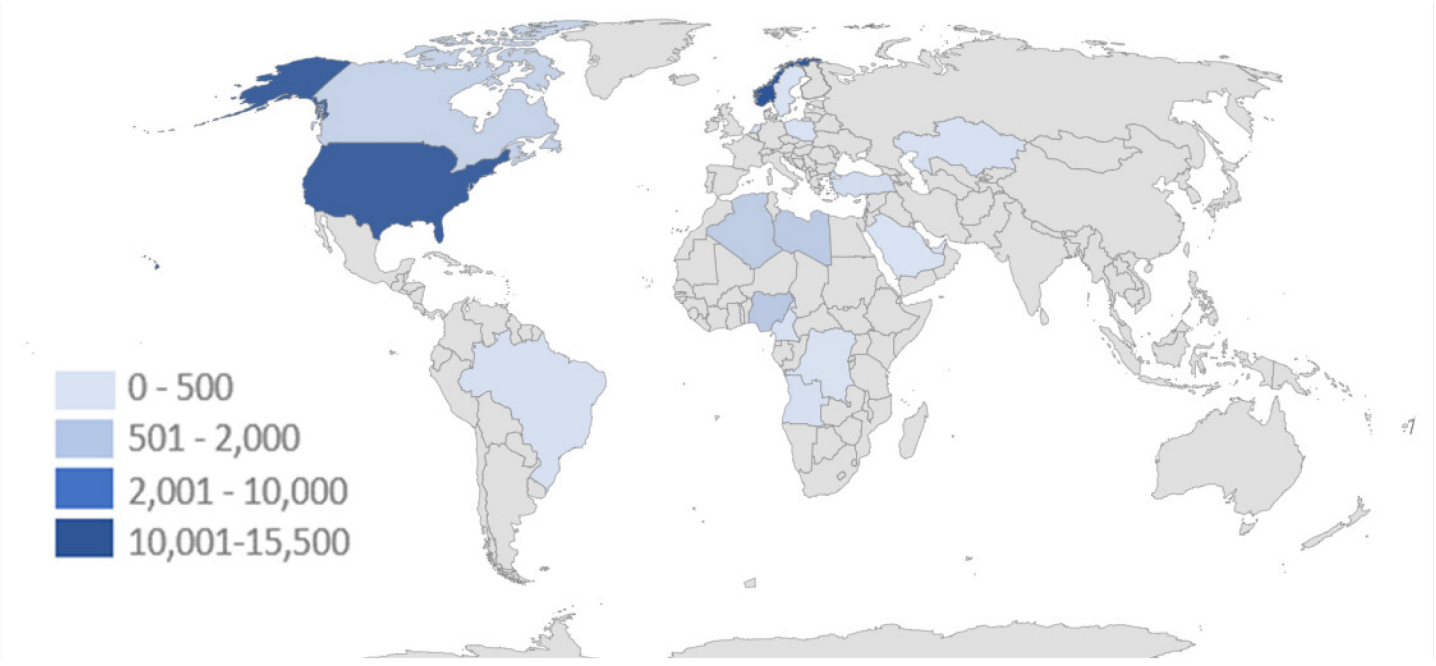
[3] Sabic, Annual Report 2021: https://www.sabic.com/en/reports/annual-2021/strategic-report/future-plans-and-investment

Chart 3.4 Supply and demand for primary oils, 1998 – 2023 (DUKES Table 3.1)



In 2023, refineries took receipt of 3.6 million tonnes of crude produced from the UK Continental Shelf, nearly halving compared to 2022 and meeting just 7.0 per cent of refinery demand in 2023 compared to 14 per cent in 2022[4]. Historically UK refineries took receipt of more North Sea crude as a share of their total supply. However, the sulphur content of crude from the North Sea means in recent years it has been less cost effective to process in the UK partly because of changes to rules on maritime shipping fuel since 2020[5]. Global markets have also played a role with North Sea crude attracting a good price in markets in the Middle East meaning it is exported there, making US crude an attractive prospect for UK refiners and meaning the US is the second largest exporter of crude to the UK.

Map 3A Sources of UK crude oil imports 2023 (thousand tonnes, DUKES Table 3.7)



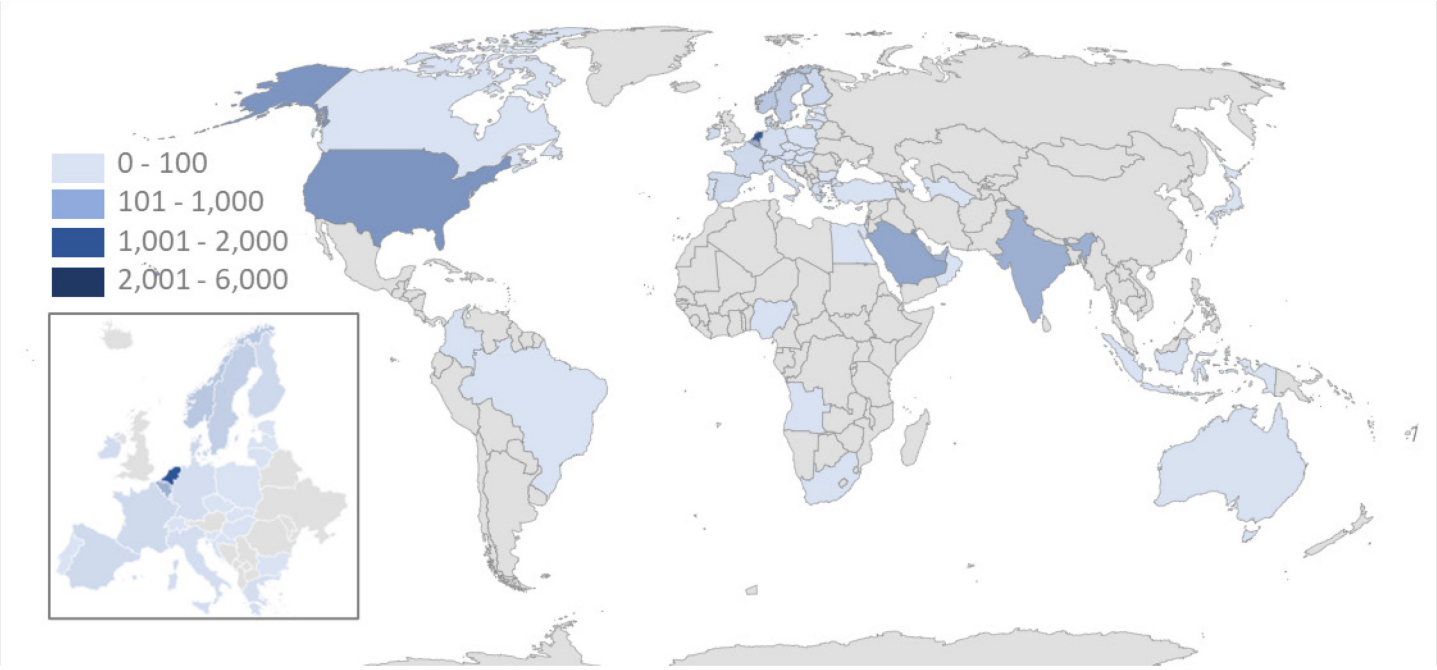
[4] See Energy Trends Table 3.10
[5] International Maritime Organization 2020, cutting sulphur oxide emissions

In 2023, Norway took back its position from the US as the number one exporter of crude oil to the UK by more than a million tonnes. Imports from Norway were up 6.3 per cent on 2022 and accounted for over a third of all crude oil imports in 2023, largely due to the shared infrastructure in the North Sea. However, Norway's share of crude imports has decreased in recent years from the high of 62 per cent in 2016.

The United States was the second largest import source of crude, down 11 per cent compared with 2022 but still accounting for a third of total crude imports.

After the ban against Russian oil introduced on 5th December 2022, importers sought different crude sources from a wider selection of countries. The UK did not import any oil from Russia in 2023. As a result, total imports from current OPEC countries increased by 30 per cent on last year and accounted for 20 per cent of the UK's crude imports in 2023. The UK exports a substantial amount of crude oil, however this decreased by 11 per cent in 2023 to a record low compared with 2022, in line with reduced production (Table 3.8).

Map 3B Sources of UK petroleum product imports 2023 (thousand tonnes, DUKES Table 3.7)

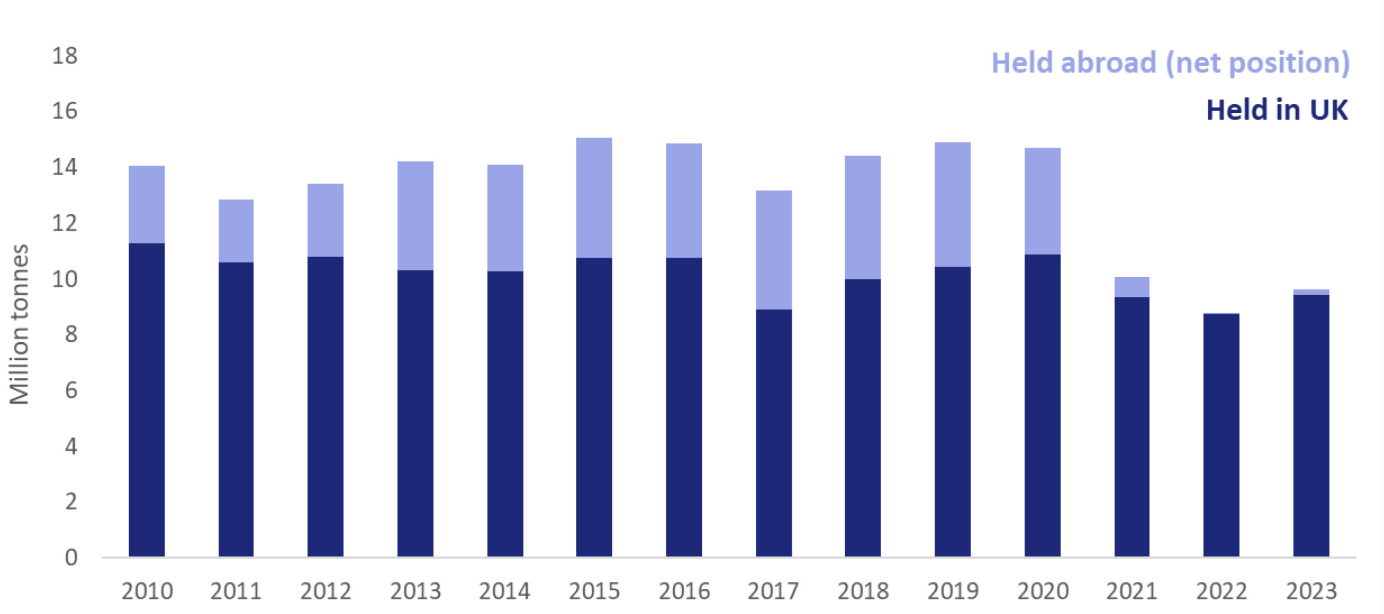


The Netherlands is a major oil trading hub and as such is the principal source of product imports for the UK. Map 3B shows UK imports of petroleum products by source in 2022. Whilst the Netherlands remained the largest import source of products at 22 per cent, the United States was the second largest import source, representing 12 per cent of product imports, replacing Belgium which was second largest in 2022. Imports of products from Australia, Brazil, China, Denmark, Greece and Qatar have all more than doubled as importers find new sources of petroleum products after the ban on Russian oil.

Imports of petroleum products increased 7.5 per cent in 2023 compared to 2022, reflecting the increase in demand and decrease in production. Diesel held the largest share of product imports, making up 42 per cent of the total. Historically Russia was the main major import source for diesel but since the sanctions suppliers have found alternative sources. In 2023 the Netherlands, the United States, and Belgium, made up 60 per cent of diesel imports collectively.

Imports of jet fuel, which are a one-third share of product imports, increased by 27 per cent in 2023. Imports were used to meet a 16 per cent increase in demand as international travel continued to recover after the travel restrictions in place to curb the spread of Covid-19. The main imports source for jet fuel were Kuwait, India and the United Arab Emirates.

Chart 3.5 UK oil stocks, 2010 – 2023 (DUKES Table 3.5)



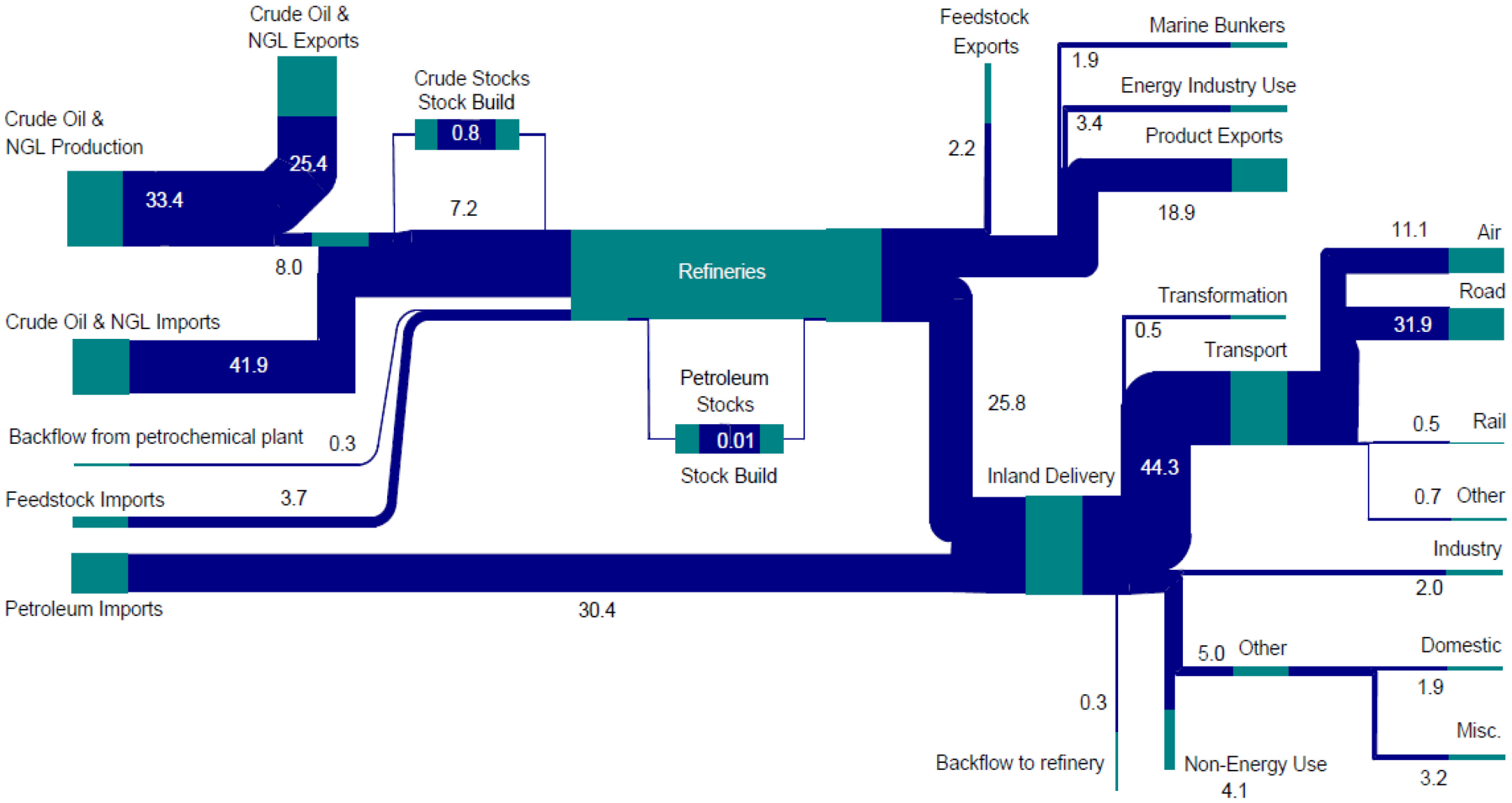
The UK government is required to hold stocks of oil which can be released in the event of severe disruption to global supply. The UK receives this obligation as a member of the International Energy Agency (IEA) and meets the obligation by directing industry to hold minimum levels of stocks. In March 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 2023, the UK held 9.6 million tonnes of stocks (DUKES Table 3.5) the equivalent of around 140 days of net imports, which is substantially higher than the required 90 days of net imports set by the IEA. This represented a 10 per cent rebound from the record annual low of 2022 when 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.

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 have since been 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 2023 (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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