Chapter 3: Oil and Oil Products

Key headlines

Oil formed just under a third of total energy demand in 2021, similar to 2020 but low compared with 2019. Following 2020 lows, demand for petroleum products increased by 4.1 per cent in 2021, with much of this growth coming from the transport sector as Covid-19 restrictions eased. Demand for key road fuels grew, with petrol and diesel demand up 11 and 10 per cent respectively.

In 2021, UK production of primary oils fell to a 7 year low at 41 million tonnes, this was 17 per cent lower than in 2020, and the UK returned to being a net importer of primary oils, at 7.9 million tonnes. Low production was a result of several factors, including maintenance of the Forties Pipeline System and delayed maintenance in 2020.

Refinery production remained stable on last year, following refinery maintenance and delays to maintenance in 2020.

Most sectors showed signs of recovery following the 2020 lows, as final consumption increased by 4.4 per cent. Whilst overall growth was seen in industry, up 4.4 per cent, the chemical sector fell 11 per cent and vehicle manufacturing fell 5.6 per cent. Non-energy use fell 17 per cent following reduced demand for Naphtha.

Domestic consumption increased by 3.9 percent following lower temperatures and the agricultural sector grew 8.7 per cent as 2021 offered more favourable growing conditions than in 2020.

Jet fuel demand continued to be heavily impacted by Covid-19 restrictions and fell to its lowest point since 1983. Global restrictions on international travel were slower to ease and demand dropped 8.4 per cent on the 2020 low.

The UK held 10.3 million tonnes of oil stock, which is the equivalent of over 900 days of oil imports, significantly exceeding the 90 days required by the International Energy Agency (IEA). The UKs stocks of oil decreased by 32 per cent, following the UKs exit from the European Union (EU) and transition to only IEA mandated stocking requirements.

The flow chart on the following page 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 2021 (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.
In 2021, primary demand for petroleum products increased by 4.1 per cent as Covid-19 related restrictions were lifted from April 2021. Much of this growth was due to increased demand in the transport sector, as restrictions on domestic travel were lifted and demand for key road fuels increased. Overall demand for petroleum products in 2021 remained lower than pre pandemic levels, down a quarter compared with 2019, at 54.6 million tonnes.

In 2021, refinery production was stable compared to 2020 up just 0.6 per cent, remaining down by almost a fifth compared to 2019. Whilst demand increased refinery production remained low for several reasons including continued restrictions in early 2021 and maintenance following delays in 2020.

The UK remained a net importer of products at 6.4 million tonnes, 0.5 million tonnes higher than in 2020. Overall, product imports remained stable on the previous year and exports dropped 1.9 per cent, however, trade remains muted compared with pre pandemic levels, with imports and exports down 25 and 11 per cent respectively compared to 2019.

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1 For further detail on the UK’s refineries and nameplate capacity, please see Annex 2 and the map of UK refineries and major import terminals in the methodology note.
The transport sector is the primary use for petroleum products in the UK, in 2021, demand for road fuels increased by 11 per cent compared to record lows in 2020. This follows fewer domestic travel restrictions compared to 2020 and the end of all restrictions by the summer of 2021. Demand for petrol increased by 11 per cent and diesel increased by 10 per cent. In recent years demand for diesel has been around twice that of petrol, as commercial fleets tend to use diesel-engine vehicles. In Quarter 1 2021, demand for petrol reached its second lowest level since 1998, as strict Covid-19 related restrictions were in place. However, by Quarter 3 2021 demand was comparable with that seen before the pandemic (for further information on quarterly trends see Energy Trends Table 3.4).

Demand for jet fuel was the most severely impacted by Covid-19 related restrictions continuing to fall in 2021, down 8.4 per cent on 2020. This follows both national and international restrictions on international travel throughout the year. Demand for jet fuel was just 4.7 million tonnes, the lowest level since 1983 and 62 per cent lower than that seen in 2019.

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2 For further detail on breakdown of fuel consumption by vehicle type, please see UK Energy in Brief, Page 22.
In 2021, demand by industry increased by 4.4 per cent compared to 2020, in line with increased production in the sector following the pandemic. However, use of oil products in the chemical and vehicle manufacturing industries decreased by 11 and 5.6 per cent respectively. Fuel use in vehicle manufacturing has primarily been impacted by supply chain issues, specifically the global shortage of computer chips and factory closures. Chemical industry use has also fallen as plants have closed and production has been halted at several sites following maintenance.

In 2021, demand for oil by the commercial sector increased by 6.3 per cent compared with 2020. This follows the reopening of many businesses and return to office working particularly in the second half of the year. There was also growth seen in the agricultural sector, which was up 8.7 per cent, following favourable growing conditions for cereals and other crop products. In 2021, domestic consumption increased by 3.9 per cent on 2020, in line with colder temperatures (Energy Trends Weather Statistics).

Non-energy use of oil products was down by 17 per cent compared to 2021, much of this fall was due to the fall in demand for Naphtha, a core component in the manufacturing of ethylene and propylene, as a major plant was shutdown for maintenance throughout the final quarter of the year.

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3 see DEFRA Total Factor Productivity Statistics
In 2021, UK production of primary oils fell to a 7 year low at 41 million tonnes, this was 17 per cent lower than in 2020. Contributing factors included an extensive planned maintenance schedule including the shutdown of the Forties Pipeline System (FPS), which serves for a significant portion of UK oil and gas production. In addition, further maintenance which was delayed in 2020 was carried out.

Demand for primary oils remained stable on last year, up 1.2 per cent due to continued restrictions and refinery maintenance but remains down 18 per cent on 2019. In 2021, exports decreased 15 per cent and imports increased by 5.6 per cent on 2020 to help meet demand amid low production. The UK returned to being a net importer of primary oils at 7.9 million tonnes. Despite this increase imports remain 19 per cent lower than those seen in 2019.

In 2021, refineries took receipt of 6.8 million tonnes of crude produced from the UK Continental Shelf (UKCS), meeting 14 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.
Sources of crude imports are shown in Map 3A and Table 3.7. **Norway remains the largest import source of crude due to its proximity and shared infrastructure in the North Sea.** Imports from Norway were up 11 per cent compared with 2020, accounting for 36 per cent 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. Imports of crude from the US have increased in recent years, accounting for 30 per cent of total crude imports in 2021.

Imports from current OPEC countries have decreased following the peak in 2013 and accounted for 20 per cent of the UK’s crude imports in 2021, this is a 60 per cent increase compared with the previous year’s low. The UK exports a substantial amount of crude oil, however this decreased by 16 per cent in 2021 compared with 2020 in line with reduced production (Table 3.8).
Imports of petroleum products were stable in 2021 compared to 2020, increasing just 0.4 per cent. Trends in imports are in line with trends in demand for example muted demand for aviation was reflected in a 18 per cent fall in imports of jet fuel whilst stronger demand in road fuels saw increases in both petrol and diesel imports, the latter up 14 per cent.

The UK has been a net importer of petroleum products since 2013 and continues to be in 2021. Domestic supply and demand are not matched on a product-by-product basis. The UK’s refineries were developed to produce petrol and as such the UK is a net exporter of petrol by 5.3 million tonnes in 2021. Conversely, to meet domestic demand, the UK is one of the larger importers of diesel and jet fuel in the OECD.

Map 3B shows UK imports of petroleum products by source in 2021. The Netherlands is a major oil trading hub and as such is the principal source of product imports for the UK (whilst refining might have taken place elsewhere). Imports of diesel accounted for almost half of all product imports in 2021, with Russia, the Netherlands, Belgium, and Sweden accounting for almost three quarters of total diesel imports. In 2021, Russian imports of diesel accounted for a third of total diesel imports. However, following Russia’s invasion of Ukraine the UK will end all dependency on Russian coal and oil by the end of 2022, and end imports of gas as soon as possible thereafter. Recent data shows a notable decline in Russian oil imports in recent months (see Energy Trends Table 3.14 for further information).
The UK government is required to hold stocks of oil which could be released in the event of severe disruption to global supply. The UK achieves this obligation by directing companies to hold minimum levels of stocks. Before 1 January 2021, the UK was obligated to hold oil stocks as a member of both the European Union (EU) and International Energy Agency (IEA). From 2021, following the UK’s exit from the EU, the UK was only obligated to hold stocks as a member of the IEA. 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.

At the end of 2021, the UK held 10.3 million tonnes of stocks (DUKES Table 3.5) the equivalent of 905 days of net imports, which is substantially higher than the required 90 days of net imports set by the IEA. This was a fall of 32 per cent when compared with 2020. Companies may choose to hold stocks within the UK or abroad via legal agreements with other countries. Following the reduction in stocking requirements many companies chose to reduce their stocks held abroad. In 2021, 7.0 per cent of stocks were held abroad, this compares to 24 per cent in 2020. For further details and more recent data, please see Energy Trends Table 3.11.