Oil

Australia’s crude oil, condensate and LPG resources (PJ)

World consumption

- 29% Diesel
- 26% Gasoline
- 12% LPG and Ethane
- 12% Other
- 8% Aviation turbine fuel
- 7% Fuel oil

Oil facts

- Carnavon basin produces around 2/3 of Australia’s crude & condensate
- Brent spot price ranged from US$17–86 a barrel, in the last 5 years
- Around 27% of refinery feedstock is domestically produced

Australia’s oil

- Holds 0.3% of the world’s oil resources
- Oil exports worth $9.0b in 2019-20
- Accounts for 0.3% of oil production

Oil | Resources and Energy Quarterly December 2020

8.1 Summary

- Although oil price volatility has eased in recent months, further price recovery has been limited by lingering COVID-19 containment measures. A gradual recovery in consumption is expected to lift Brent crude prices from US$44 a barrel in the December 2020 quarter to US$57 a barrel by the December 2022 quarter.
- Australian crude oil and condensate exports in 2020–21 are expected to increase by 4.6 per cent to 304,000 barrels a day, and remain around these levels in 2021–22 (see Australia section).
- Low prices are expected to lead to Australian export earnings falling by 20 per cent to $7.2 billion in 2020–21. An uptick in prices is expected to lift earnings to $8.3 billion in 2021–22.

8.2 Prices

Brent prices remaining around US$40 a barrel

Oil prices have been relatively stable in recent months, following the wild swings earlier in 2020. Prices fell below US$20 a barrel in early April, as global production exceeded global consumption by around 25 million barrels a day — equivalent to around 25 per cent of average production in 2019. Later in April, prices began to recover, propped up by the 12 April OPEC+ announcement that member countries would reduce production in May and June 2020 by a record 9.7 million barrels a day.

Between June 2020 and September 2020, prices hovered around US$40 a barrel, as consumption growth was constrained by COVID-19 containment measures. More recently, prices have been affected by rising Northern Hemisphere COVID-19 cases and promising COVID-19 vaccine trial announcements. Prices fell by 13 per cent between 20 October and 30 October, as some EU governments announced fresh containment measures to address rising COVID-19 cases (see the macroeconomic chapter). Over November 2020, prices increased by 24 per cent to reach US$47 a barrel, in response to promising COVID-19 vaccine trial announcements (Figure 8.1).

Figure 8.1: Brent oil prices in 2020

Source: Bloomberg (2020)

Prices to increase slowly over the outlook period

Oil prices are expected to increase over the outlook period as COVID-19 containment measures ease and consumption recovers. Established OPEC+ targets, and current low exploration expenditure in Canada and the US are expected to limit any production response, further supporting prices. Prices are expected to increase from an estimated US$44 a barrel in the December quarter of 2020 to reach US$51 a barrel in the December quarter of 2021. In 2022, prices are forecast to increase further, reaching US$57 a barrel by the December quarter (Figure 8.2).

The timing and rate of likely price increases remains highly uncertain. Consumption may vary significantly depending on unforeseen changes in COVID-19 containment measures, as governments and households react to subsequent waves of the pandemic, and household confidence recovering as COVID-19 cases fall. The possibility of an effective COVID-19 vaccine(s) at some time in the outlook period is also expected to influence global oil consumption and prices. Despite recent promising COVID-19 vaccine trial results, it is unlikely that the rollout of these vaccines will significantly support oil consumption before the second half of 2021, reflecting the time required to distribute doses around the world.
Substantial uncertainty also exists on the supply-side, primarily from OPEC+ members. OPEC+ is scheduled to increase production by 0.5 million barrels a day in January 2021. However, output beyond January 2021 remains uncertain, as production targets can be adjusted in monthly ministerial meetings. Output is also uncertain for the OPEC+ members currently exempt from production targets, including Libya, Iran and Venezuela. With production in these countries affected by either blockades or international sanctions, unexpected political changes are likely to affect global prices.

Figure 8.2: Oil prices

Source: Bloomberg (2020); Department of Industry, Science, Energy and Resources (2020)

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8.3 World Consumption

Low aviation travel to constrain consumption

Global crude oil and natural gas liquids consumption in 2020 is expected to have fallen by an estimated 9.1 per cent to 91 million barrels a day. If realised, this would be the first decline since 2009, and the largest historical decline in volume terms. Consumption is forecast to fall in all major consuming countries, as travel demand and industrial production both fall because of COVID-19 containment measures. Although the largest impacts are expected in the first half of 2020, consumption for each month of 2020 is expected to be below 2019 levels.

Indicators suggest that road activity fell by around 50 per cent in some major cities in April. The recovery in global road activity later in 2020 has been limited, as COVID-19 has spread to other developing nations and for some countries, containment measures have lingered. In recent months, Northern Hemisphere road activity has been affected by persistently high COVID-19 cases in the US and a resurgence in COVID-19 cases in the EU. Targeted EU containment measures introduced in the December quarter are likely to further constrain global oil consumption. As the US and EU are two of the world’s three largest oil consumers, future transport demand growth is likely to depend on COVID-19 cases declining in the Northern Hemisphere.

Although transportation demand is expected to rise as containment measures ease, aviation demand is expected to remain weak over the outlook period. About two thirds of global passenger traffic is international travel — which is unlikely to recover fully until a vaccine is rolled out. The International Air Transport Association expects that global passenger traffic will not return to 2019 levels until 2024. Domestic air travel is expected to rise gradually over the outlook period, as countries ease restrictions on internal travel. However, domestic air travel is expected to remain below 2019 levels over the outlook period.

Oil consumption for the manufacturing of plastic and other petrochemicals declined sharply in the first half of 2020, but was more resilient than travel-based oil consumption. Similar to other manufactured products,
The demand for manufactured oil products has been affected by low household consumption and supply chain disruptions.

Global consumption in 2020 has also been constrained by poor refining margins, as end-use demand is affected by containment measures and low consumer confidence. In addition to low refining throughput, some countries have increased their strategic reserves, pushing global crude stocks starkly higher. Geographically, a high proportion of the stock build-up is occurring in China and the US, two major oil consuming nations. High stocks in these countries will weigh on oil prices once the impacts of the COVID-19 pandemic ease. Stock accumulation is expected to have ended in the June quarter of 2020, although the price limiting impacts are expected to persist throughout the outlook period.

Figure 8.3: OECD and non-OECD oil consumption

In 2021, demand is forecast to recover to 97 million barrels a day; still 3.3 per cent below 2019 levels, as aviation demand remains limited. Demand is forecast to rise further to 100 million barrels a day in 2022 (Figure 8.3).

OECD consumption is expected to drop

The COVID-19 pandemic and the associated containment measures have significantly disrupted OECD consumption. Between 2012 and 2019, OECD oil consumption was steady at around 48 million barrels a day, as ongoing energy efficiency improvements offset higher transport needs. This period of stability is expected to end in 2020, as containment measures affect travel and aviation demand in OECD economies. OECD consumption is expected to have been most affected during the June quarter of 2020. However, the recovery in later quarters has been constrained by surging number of COVID-19 cases in the Northern Hemisphere, which are primarily occurring in OECD economies. These impacts are expected to limit OECD consumption in the December quarter of 2020 and the March quarter of 2021. OECD consumption in 2020 is forecast to fall by 12 per cent to 43 million barrels a day, before increasing to 46 million barrels a day in 2021 and 2022.

US consumption is expected to fall by 11 per cent to 18 million barrels a day in 2020, as persistently high COVID-19 cases weigh on road activity and travel demand. Although containment measures eased over the June quarter, the subsequent recovery in consumption has been muted as households reduce non-essential travel due to persistently high COVID-19 cases. Consequently, further growth in US oil consumption is likely to depend on falling COVID-19 cases, complicated by variability across states. In 2021, US demand is forecast to rise to 19 million barrels a day.

EU consumption is expected to decline by 13 per cent to an estimated 12 million barrels a day in 2020. To address rising COVID-19 cases, some EU member states introduced containment measures in the December quarter. As a result, the recovery in EU consumption is expected to be uneven and unsteady across member states. Consumption is forecast to recover in 2021, reaching 13 million barrels a day, and remaining around these levels in 2022.

There are likely to be some behavioural shifts once the COVID-19 pandemic recedes that will have material impacts on the oil market. This may occur through a shift towards working from home, evolving commuting patterns, and lingering impacts on long haul air travel. This raises the level of uncertainty for oil consumption late in the outlook period.
Consumption in other OECD nations is also expected to fall significantly in 2020; Australia, Japan and South Korea all introduced containment measures in the first half 2020. Although measures in these nations eased in the June quarter 2020, localised outbreaks in these nations have led to the subsequent imposition of targeted, temporary containment measures.

Non-OECD consumption to plummet, driven by China and India

Non-OECD consumption is estimated to fall by 3.6 million barrels a day to 49 million barrels a day in 2020, compared to the 2019 increase of 1.1 million barrels a day.

Chinese consumption in 2020 is expected to increase marginally to 14 million barrels a day. This forecast increase is in contrast to most other economies, where consumption is forecast to fall considerably. Consumption has recovered strongly since the March quarter, which fell by 16 per cent on a quarterly basis. Future Chinese imports may be affected by record levels of oil in storage in China, accumulated from imports made when prices reached multi decade lows during the June quarter of 2020 (Figure 8.4). Lower Chinese imports would negatively affect global oil prices, since China accounted for over 80 per cent of oil consumption growth in 2019. Chinese demand is forecast to rise by 6.1 per cent in 2021 and 2.8 per cent in 2022.

Indian consumption in 2020 is expected to fall by 9.1 per cent to 4.7 million barrels a day. Indian consumption has been affected by the national lockdown for much of the June quarter, and by varying containment measures across states since. Consumption has also been negatively affected by the effects of the extremely wet monsoon season. Consumption somewhat recovered in the September quarter, as containment measures eased. Indian consumption is forecast to increase over the rest of the outlook period, reaching 5.3 million barrels a day in 2021 and 5.6 million barrels a day in 2022.

Non-OECD consumption in 2021 is forecast to increase by 5.3 per cent to 51 million barrels a day, largely driven by higher demand in China and India. Consumption is forecast to reach 53 million barrels a day in 2022.

8.4 World Production

Global oil production is expected to fall in 2020, as OPEC+ production declines to meet targets and output in other nations (such as the US) falls in response to lower global prices (Figure 8.5). Output is estimated to fall by 7.0 per cent in 2020 to 93 million barrels a day. In 2021, oil production is forecast to increase marginally to 94 million barrels a day, before recovering to 98 million barrels a day in 2022.

Although oil production is forecast to increase, low oil prices throughout 2020 are expected to reduce exploration expenditure and affect oil production over the outlook period. Investment decisions are the most sensitive in higher-cost producing nations such as Canada and the US, though all producing nations are expected to be affected. This is evident in the Saudi Aramco March 2020 announcement, which flagged plans to reduce capital expenditure, despite Saudi Arabia being one of the lowest cost producers.
Over 2020, OPEC+ output targets were lowest between May and July, before output cuts were reduced from August 2020. The member countries that exceeded their production targets during May/June agreed to compensate with further output cuts between July and September. During this period, compliance for these countries was high, as was compliance in other OPEC+ members. The forecasts contained in this publication assumes that OPEC+ members fully comply with production targets.

Under the current agreement, OPEC+ production targets are scheduled to increase in January 2021. Over the rest of the outlook period, output is expected to rise steadily. However, the timing of these increases is uncertain, and will be determined in monthly OPEC+ meetings. Compliance with the OPEC+ agreement across member nations is a key risk to excess global output, and may result in renewed OPEC+ tensions.

Production could rise considerably for the nations exempt from the current OPEC+ agreement, although the timing and rate of these gains is highly uncertain. For much of 2020, Libyan output was affected by blockades on oilfields and export facilities, initially imposed in January 2020 but remaining in place until September 2020. After this blockade passed, Libyan output rose noticeably, from 0.1 million barrels a day in September 2020 to 1.2 million barrels a day in November 2020. This increased production has occurred in a market that is already facing low prices and considerable levels of oil in storage. However, the outlook for future Libyan production remains uncertain, and will depend on the UN mediated truce remaining in effect. Libyan production is forecast to average 1.3 million barrels a day in 2021 and 1.5 million barrels a day in 2022.

Production in Iran and Venezuela could also increase significantly if international sanctions ease. The sanctions affecting both countries may be influenced by the incoming US administration. However, both sets of sanctions are expected to remain in place over the outlook period, and production over the next two years is forecast to remain at 2020 levels.

OPEC+ production in 2020 is expected to average 46 million barrels a day, down 16 per cent from 2019. This year-on-year decline is expected to be limited by elevated production between January and April. Output is expected to fall further to 45 million barrels a day in 2021, as output targets are assumed to be in place for the whole of 2021. In 2022, production is forecast to recover to 51 million barrels a day.

Non-OPEC+ production to drop in response to low prices

In 2020, production is also expected to decline significantly in non-OPEC+ nations, as producers respond to low global prices. Non-OPEC+ output was estimated to be at its lowest point in the year in the June quarter, before rising marginally as some producers responded to higher prices.

US production is estimated to fall by 5.3 per cent to 16 million barrels a day in 2020. The majority of this decline is expected to have occurred in the June quarter 2020, with production averaging 14 million barrels a day. In the first half of 2020, US producers reduced capital expenditure and
their oil rig count. In combination with declining production from existing wells, this is expected to keep US production low in 2021. US oil production may also be affected by the ongoing legal challenge on the Dakota Access Pipeline. Although the pipeline is allowed to continue operating while legal proceedings are ongoing, this presents a downside risk to US supply, as some fields become less economically viable. In 2021, US production is forecast to increase to 17 million barrels a day, before increasing to 18 million barrels a day in 2022.

Canadian production is estimated to decline by 4.4 per cent to 5.3 million barrels a day in 2020, as relatively high production costs and dwindling storage capacity influence producer decisions. Canadian production is forecast to increase to 5.6 million barrels a day in 2021, and 5.7 million barrels a day in 2022.

In 2021, non-OPEC+ output is forecast to rise by 3.6 per cent to 48 million barrels a day. Non-OPEC+ output is forecast to rise further in 2022, to 49 million barrels a day.

**8.5 Australia**

**Final investment decisions on gas projects to influence oil production**

In 2019–20, Australian crude and condensate production increased by 18 per cent to 372,000 barrels a day, as crude output rose as a result of Woodside’s Greater Enfield project. Late in the fiscal year, condensate and LPG production was affected by the temporary shutting of the Prelude FLNG project from February 2020. At the time of writing, Prelude remains offline, with no official restart date announced.

Production is forecast to rise marginally in 2020–21, as output recovers at existing fields. Output is expected to remain at around these levels in 2021–22. Beyond the outlook period, the deferral of final investment decisions for several gas projects may affect future condensate and LPG production, with the production of both commodities typically associated with gas production (see the gas chapter). In 2019–20, condensate and LPG accounted for 47 per cent and 22 per cent of total Australian oil production, respectively (Figure 8.6).

![Figure 8.6: Composition of Australian oil production](chart.png)

**Australian exports to be affected by low prices**

In 2019–20, Australian crude oil and condensate export values in 2019–20 were $9.1 billion. This was 0.1 per cent lower than what was recorded in 2018–19, despite export volumes increasing by 14 per cent. In 2020–21, export values are forecast to decline by 20 per cent to $7.2 billion, with prices expected to remain low over the full fiscal year. Weak prices are expected to more than offset growing export volumes, which are expected to increase by 4.6 per cent in 2020–21. Export values in 2021–22 are forecast to increase by 15 per cent to $8.3 billion, driven by higher prices.

**Kwinana refinery closure to reduce Australian throughput**

Australian refinery throughput fell significantly in early 2020 (Figure 8.7), as low transport demand reduced Australian refinery profitability. As a result, all of Australia’s refineries announced plans to lower production until margins recovered. Furthermore, in October 2020, BP announced plans to close their Kwinana refinery and convert it to an import terminal. BP attributed this decision to persistent low refining margins and fierce competition with international fuel refineries. These competitive pressures may also affect the future operations of the remaining three Australian...
refineries, with Ampol and Viva recently announcing that they are assessing the long-term viability of their Australian refineries.

Australian refinery output is expected to fall gradually between the December quarter 2020 and the June quarter 2021. The winding down of production at BP’s Kwinana refinery is expected to more than offset a recovery in production at the remaining three refineries after being affected by the downturn in demand caused by COVID-19 containment measures. Over the rest of the outlook period, refinery throughput is forecast to remain around June 2021 levels, fluctuating in line with plant maintenance.

Australian refined product consumption fell in 2019–20, as COVID-19 containment measures weighed heavily on activity in the first half of 2020. Consumption is forecast to recover in 2020–21, as containment measures across states ease. However, aviation demand is expected to remain low, as air travel remains depressed. In Australia, aviation consumption accounts for a relatively high share of product usage — about 15 per cent.

**Figure 8.7: Australian refinery output 2019–20**

Exploration

In the September quarter 2020, Australian petroleum exploration expenditure was a seasonally adjusted $220 million, a quarterly increase of $8.4 million or 4.0 per cent. However, this is 39 per cent lower year-on-year, as a 60 per cent decline in offshore exploration more than offset a 2.0 per cent increase in onshore exploration. A tighter domestic gas market could support ongoing growth in onshore petroleum exploration, with the Australian Energy Market Operator forecasting a possible shortfall of natural gas in Australian southern states by 2024.

**Figure 8.8: Australian petroleum exploration**

Revisions to the outlook

The forecast for Australian export earnings has been revised up by $0.1 billion for 2020–21, reflecting upwards oil price revisions. Export earnings in 2021–22 have been revised downwards by $0.1 billion, largely reflecting upwards exchange rate revisions.
Table 8.1: Oil Outlook

<table>
<thead>
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<th>World</th>
<th>Unit</th>
<th>2019</th>
<th>2020&lt;sup&gt;a&lt;/sup&gt;</th>
<th>2021&lt;sup&gt;f&lt;/sup&gt;</th>
<th>2022&lt;sup&gt;f&lt;/sup&gt;</th>
<th>Annual percentage change</th>
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<td>2020&lt;sup&gt;a&lt;/sup&gt;</td>
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<tr>
<td>Production&lt;sup&gt;a&lt;/sup&gt;</td>
<td>mb/d</td>
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<td>93.0</td>
<td>94.1</td>
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<tr>
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<td>mb/d</td>
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<td>91.0</td>
<td>96.8</td>
<td>99.8</td>
<td>-9.1</td>
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<tr>
<td>– nominal</td>
<td>US$/bbl</td>
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<td>40.6</td>
<td>46.0</td>
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<td>– real&lt;sup&gt;b&lt;/sup&gt;</td>
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<td>40.6</td>
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<td>– nominal</td>
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<tr>
<td>Crude and condensate</td>
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<tr>
<td>Production&lt;sup&gt;ac&lt;/sup&gt;</td>
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Notes: a The number of days in a year is assumed to be 365, and a barrel of oil equals 158.987 litres; b In 2020 calendar year US dollars; c Historical production data was revised in the September quarter 2020 to align with Australian Petroleum Statistics. d Primary products sold as LPG; e Excludes LPG; g Domestic sales of marketable products, including imports; f Forecast; h In 2020–21 financial year Australian dollars; s estimate.

Sources: ABS (2020) International Trade in Goods and Services, Australia, Cat. No. 5368.0; International Energy Agency (2020); EnergyQuest (2020); US Energy Information Administration (2020); Department of Industry, Science, Energy and Resources (2020).