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

- 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 22% of refinery feedstock is domestically produced
- Australian crude oil and condensate production peaked in 2000–01

World consumption

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

Australia’s oil

- Holds 3% of the world's oil resources
- Oil exports worth $10b in 2019
- Accounts for 3% of oil production
8.1 Summary

- Oil prices are forecast to increase in the second half of 2020, but to remain relatively low as the COVID-19 pandemic limits global consumption. Brent crude prices are forecast to average US$42 a barrel in 2020, down from US$64 a barrel in 2019.
- Australian crude oil and feedstock exports are estimated to have risen to 292,000 barrels a day in 2019–20. Exports are expected to peak at 300,000 barrels a day in 2020–21 before falling marginally in 2021–22.
- Australian oil export earnings are estimated to decline marginally to $9.0 billion in 2019–20, reflecting low prices late in the fiscal year. Ongoing low prices are expected to lead to export earnings falling to $6.8 billion in 2020–21, before a price rebound lifts earnings to $8.6 billion in 2021–22.

8.2 Prices

Oil prices have fluctuated significantly so far in 2020

Global oil prices dropped dramatically in the first half of 2020, with the sharpest decline following the OPEC+ meeting on 6 March. In this meeting, OPEC+ members could not agree to production targets to address the impacts of COVID-19, nor to extending the production cuts already in place. Between 6 March and 31 March, prices fell by 53 per cent, on expectations that Russia, Saudi Arabia and the rest of OPEC+ would increase output in the face of dwindling consumption.

In April 2020, global production was estimated to exceed global consumption by around 25 million barrels a day (Figure 8.1). This is the equivalent of about 25 per cent of 2019 production, resulting in available storage capacity falling sharply in many parts of the world. These storage constraints saw the WTI contract (for May delivery) fall to −US$38 a barrel on the second last day of trading of the contract, down from US$18 a barrel on the previous day. Market players with long positions but no storage capacity were effectively paying buyers to take delivery of this oil. Prices reverted to US$12 a barrel on the first day of trading of the June contract.

Facing falling prices and strong export competition between OPEC+ member countries, members agreed on 12 April 2020 to reduce production in May and June 2020 by a record 9.7 million barrels a day. On 6 June 2020, these production cuts were extended until the end of July. Beyond July, OPEC+ production is scheduled to slowly increase until targets expire on 30 April 2022. Production in several non-OPEC+ producing countries (such as the US) has also fallen in response to low global oil prices.

In recent weeks, oil prices have partly recovered as chronic oversupply eases. Lower global production resulted in the Brent oil price rising by 71 per cent between 1 May 2020 and 16 June 2020, to around US$40 a barrel. Despite this gain, prices remain well below the 2015-2019 average, as global output exceeds usage. However, once the impacts of COVID-19 on global oil consumption ease, established OPEC+ production targets out to April 2022 are likely to drive global prices higher.
Prices to recover gradually over the outlook period

Oil prices are forecast to remain low for the rest of 2020. Low oil prices are expected to persist for longer than other energy commodities, as the recovery in global oil consumption is expected to be particularly slow. Although transportation demand is expected to pick up as quarantine measures ease, aviation demand is expected to remain weak until international travel recovers — with the International Air Transport Association estimating that air travel demand will not return to 2019 levels until 2023. The Brent benchmark is forecast to average US$43 a barrel in the September quarter 2020 and US$44 a barrel in the December quarter 2020 (Figure 8.2), up from an estimated US$31 a barrel in the June quarter 2020.

Prices in 2021 are forecast to recover to US$45 a barrel, with prices to increase over the year, reaching US$47 a barrel in the December quarter. Global consumption is expected to exceed production, as consumption recovers and production is curtailed by relatively low oil prices. Prices in 2022 are forecast to increase further to average US$53 a barrel.

Figure 8.2: Oil prices

The outlook for the oil sector is highly uncertain, arising from both geopolitical factors and the high sensitivity of the oil market to the impacts of the COVID-19 pandemic. The Resources and Energy Quarterly publication normally provides point forecasts which attempt to summarise the balance of risks, based on the best information available at the time. However, to better address the sizable uncertainty facing oil markets, this edition also presents scenario analysis on a range of oil price forecasts and the impact on Australian LNG export earnings (see Box 8.1).

8.3 World consumption

Consumption to fall significantly in 2020

Global oil consumption in 2020 is forecast to fall by 9.2 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 transportation consumption and industrial production both decline as a result of COVID-19 restrictions. Although the largest impacts are expected in the first half of 2020, consumption for each month is expected to be below values from 2019.

Indicators suggest that road activity fell by around 50 per cent in some cities in April. COVID-19 related restrictions are expected to ease in the second half of 2020, leading to a recovery in commuting demand. Aviation consumption is forecast to remain low over the rest of 2020, as international travel is limited by stringent quarantine measures.

Industrial oil consumption is estimated to have declined sharply in the first half of 2020, but to be more resilient than travel-based oil consumption. After the production disruptions posed by COVID-19 related containment measures ease, demand for manufactured oil products is expected to be affected by low consumer confidence and lagged unemployment impacts.

Global consumption in 2020 is also expected to be constrained by poor refining margins, as end-use demand is affected by containment measures and low consumer confidence. Despite low crude oil prices, minimal consumer demand has pushed down refining margins and reduced refining throughput. This low refining throughput, along with some
countries increasing their strategic reserves, is 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 as the impacts of the COVID-19 pandemic ease. The rate of stock accumulation is expected to end in the September quarter of 2020 as consumption recovers.

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 is forecast to recover to 97 million barrels a day in 2021 but grow more slowly in 2022 to 101 million barrels a day (Figure 8.3).

**Figure 8.3: Oil consumption, OECD and non-OECD**

OECD consumption to drop

Between 2012 and 2019, OECD oil consumption was relatively steady at around 48 million barrels a day, as energy efficiency improvements offset higher transport needs. This period of stability ended in 2020, as quarantine measures have curtailed commuting and aviation demand. The falls are expected to have been largest in the June quarter 2020, when containment measures severely cut usage in the EU and the US — the world’s two largest oil consumers. In 2021, consumption is forecast to recover to close to 2019 levels, with aviation demand still lagging during much of 2021. Consumption is forecast to recover to 48 million barrels a day in 2022.

China and India to lead decline in non-OECD consumption

Non-OECD consumption is forecast to fall by 4.7 million barrels a day in 2020, compared to the 2019 increase of 1.1 million barrel a day.

In 2019, China accounted for over 80 per cent of global consumption growth, and Chinese consumption is a key driver of global oil prices. This was evident when oil prices fell by 16 per cent in January 2020 — when COVID-19 was largely confined to China. In the first quarter of 2020, Chinese oil consumption fell by 17 per cent on a quarterly basis (Figure 8.4). Chinese usage in 2020 is forecast to fall by 7 per cent to 13 million barrels a day.

Indian consumption in 2020 is forecast to fall by 8 per cent to 4.6 million barrels a day. Consumption is expected to have fallen significantly in the June quarter of 2020, reflecting strict quarantine measures. In late March 2020, India entered national lockdown for an initial three weeks, with this lockdown later extended to June 30 for certain areas of the country.

Non-OECD consumption in 2021 is forecast to increase by 5 per cent to 50 million barrels a day, largely driven by a recovery in demand in China and India. Consumption is forecast to increase further to 53 million barrels a day in 2022.
8.4 World production

Global oil production is forecast 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. Output is forecast to fall by 8.6 per cent to 92 million barrels a day. During 2020, OPEC+ output is expected to be lowest between May and July, before gradually increasing later in the year. Timely indicators for May production suggests that OPEC+ member compliance with new production targets is relatively high. Outside of OPEC+, output fell noticeably in April/May, as producers responded to low global prices (Figure 8.5). Non-OPEC+ production is expected to be lowest in the September quarter 2020, before increasing marginally as some low-cost producers respond to slightly higher prices.

Low oil prices are likely to influence investment decisions, leading to a downwards revision in production from the March 2020 Resources and Energy Quarterly. Although this is largely expected to occur in higher-cost producers such as Canada and the US, all producing nations are expected to be affected. This is evident in the Saudi Aramco announcement in March 2020, which flagged plans to reduce capital expenditure, despite Saudi Arabia being one of the lowest cost global producers.

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September. Assuming full compliance with production targets over the outlook period, OPEC+ production in 2020 is forecast to fall by 17 per cent to 51 million barrels a day. Output is forecast to fall further to 49 million barrels a day in 2021. In 2022, production is forecast to increase by 17 per cent to 56 million barrels a day (this assumes that production beyond April 2022 is slightly above 2019 production targets).

Non-OPEC+ production to drop in response to low prices
Production in non-OPEC+ nations is also expected to fall, as producers respond to low prices. US production is forecast to fall by 6 per cent to 16 million barrels a day (Figure 8.6). Canadian production is forecast to decline by 9 per cent to 5.1 million barrels a day in 2020, as relatively high production costs and dwindling storage capacity influence producer decisions. In 2021, non-OPEC+ production is forecast to increase by 4 per cent to reach 42 million barrels a day. Output in 2022 is forecast to rise further to 44 million barrels a day.

Figure 8.6: US production

8.5 Australia
Final investment decisions on gas projects to influence oil production
In 2019–20, Australian crude and condensate production is estimated to increase by 21 per cent to 412,000 barrels a day (Figure 8.7), as crude production rises as a result of Woodside’s Greater Enfield project. Condensate and LPG production is expected to be affected by the temporary shutting of the Prelude FLNG project from February 2020 (see the gas chapter).

Figure 8.7: Composition of Australian oil production


Production is forecast to fall slightly in 2020–21 and 2021–22, as production continues to decline at existing fields. Beyond the outlook period, the deferral of final investment decisions (FIDs) 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 2018–19, condensate accounted for 57 per cent of total Australian crude oil, condensate and LPG production. LPG accounted for a further 16 per cent.
Australian exports to be affected by low prices

In recent months, Australian exports have fallen in both value and volume terms, as global consumption and prices declined. In the March quarter 2020, export volumes fell by 15 per cent on a quarterly basis. Export values fell by even more, down 24 per cent.

Australian export values in 2020–21 are forecast to fall by 24 per cent to $6.8 billion, then recover to $8.6 billion in 2021–22, as global prices rise and demand for Australian grades increases.

**Figure 8.8: Australian oil and feedstock exports**

![Graph showing Australian oil and feedstock exports from 2011-12 to 2021-22](image)

Notes: Includes crude oil and condensate, but excludes LPG. 

Australian consumption

Australian refinery throughput is expected to decline in 2019–20, as low household demand weighs on the profitability of the Australian refineries. As a result, all four of Australia’s remaining refineries have recently announced plans to adjust future production. Caltex announced it would temporarily shut its Brisbane refinery until margins improve. The other three refineries have announced plans to adjust production volumes. BP and Viva have also announced plans to delay maintenance. Australian refinery throughput is expected to recover late in 2020, and reach usual monthly volumes by the March quarter of 2021. Over the rest of the outlook period, refinery throughput is forecast to remain at around these levels, fluctuating in line with plant maintenance.

Australian oil consumption is estimated to have fallen in 2019–20, as COVID-19 restrictions weighed heavily on activity in the first half of 2020. Consumption is forecast to recover in 2020–21, supported by an expected easing of these restrictions in the second half of 2020. Australian oil usage is expected to recover faster than the global average. However, aviation demand is expected to remain low, as travel is expected to be confined to the Oceania region. In Australia, aviation consumption accounts for a relatively high share of oil usage — about 15 per cent in 2019.

Exploration

Australia’s petroleum exploration expenditure was $294 million in the March quarter, on a seasonally adjusted basis, a quarterly decrease of $84 million or 22 per cent. This national decline was largely driven by falls in Queensland (down $32 million) and Western Australia (down $15 million).

**8.6 Revisions to forecasts**

Australian export earnings have been revised down by $3.2 billion in 2020–21 and by $2.4 billion in 2021–22. This largely reflects the impacts of COVID-19 on oil prices, but a downward revision to export volumes has also reduced forecast export earnings. Additionally, global production and consumption have both been revised down.
Oil prices have fluctuated sharply in 2020, affected by COVID-19 and tensions between OPEC+ members. Between 2 January and 25 May 2020, Brent prices have ranged between US$17 a barrel and US$69 a barrel, and WTI prices have ranged between -US$38 a barrel and US$63 a barrel. Although oil prices have been less volatile since May 2020, there is still a high degree of uncertainty for the short-term oil outlook. This uncertainty presents significant risks to the outlook for the Australian commodity sector: although Australia is not a major oil producer or exporter, almost three quarters of Australian LNG exports are sold under oil-linked long-term contracts. These contracts link the price of LNG sold to the price of oil (commonly the Japan customs-cleared crude, JCC) with a time lag of several months. The remaining LNG is sold at spot prices or on short-term contracts.

This scenario analysis illustrates the impacts of oil price variability on LNG export earnings. For the purposes of this analysis, all other factors which influence Australian LNG export earnings (LNG spot prices, exchange rates, export volumes) are held constant.

To illustrate the potential impacts of oil price movements on Australian LNG export earnings, a baseline and three scenarios are examined for oil prices (Figure 8.1). The scenarios use different assumptions for the impacts of COVID-19 on oil markets, OPEC+ production, and oil stocks.

Baseline

The baseline uses the oil prices forecasts in the oil chapter. Under the baseline, Australia’s LNG exports earnings are forecast to decline from an estimated $49 billion in 2019–20 to $34 billion in 2020–21, before partly recovering to $40 billion by 2021–22 (see the gas chapter).

Scenario 1: prices recover quickly

Scenario 1 is the most optimistic of the three. It assumes that early in the second half of 2020, quarantine measures ease and transport demand increases rapidly. With the exception of aviation consumption, all components of oil consumption return to usual volumes relatively quickly. Furthermore, a vaccine is assumed to be developed in the June quarter of 2021, and aviation travel demand increases rapidly.

On the production side, OPEC+ output cuts and market-driven reductions from other producers are effective in stabilising oil prices. OPEC+ members are assumed to fully comply with these output targets, and do not compete for market share as prices rise. As a result, global oil stocks begin falling in the second half of 2020. Beyond 2021, oil consumption and production are expected to be fairly similar to the baseline case, with OPEC+ sticking to agreed production cuts out to April 2022. However, higher prices than in the baseline case in result in a smaller, market-driven fall in non-OPEC+ output. Demand is similar to the baseline case, except that aviation demand gains sooner and faster.

Oil prices are assumed to rise to US$49 a barrel in the December quarter 2020. Prices are forecast to average US$53 a barrel in 2021, and US$61 a barrel in 2022.

Under Scenario 1, relative to the baseline scenario, Australia’s LNG export earnings are estimated to be $1.6 billion higher in 2020–21 and $6.2 billion higher in 2021–22.

Scenario 2: prices recover more slowly

Scenario 2 is slightly more pessimistic than the baseline scenario: it assumes that the greatest impacts of COVID-19 on the oil market were in the second quarter of 2020, but that the recovery is slower and more uneven across countries. Aviation demand recovers at the same point in 2021, but low consumer confidence leads to a protracted slowdown. In this scenario, not all OPEC+ members fully comply with production targets, and the decline in non-OPEC+ production is more moderate. This may occur due to ongoing competition for market share between major oil exporters or governments trying to maintain oil sector employment. As a result of elevated production, oil storage capacity falls further in the September 2020 quarter. Stocks are assumed to remain elevated throughout 2021, limiting price growth.
Under Scenario 2, Australia’s LNG export earnings are estimated to be $3.3 billion lower in 2020–21 and $0.6 billion lower in 2021–22, relative to the baseline scenario.

**Scenario 3: prices fall further**

Scenario 3 is the most pessimistic scenario, where oil consumption falls by the most and the production response to low prices is muted. Consumption is assumed to fall by more than in the baseline case, as some countries struggle to bring the COVID-19 pandemic under control. More severe economic impacts lead to higher falls in the components of oil consumption tied to industrial production, and these impacts persist for longer. Major exporters may choose to continue fighting for market share, or OPEC+ tensions may resurface as member countries exceed production targets. In this case, production responses aren’t sufficiently timely and global spare storage capacity dwindles. As a result, prices fall further, down to US$26 a barrel in the September quarter 2020 and US$25 a barrel in the December quarter 2020.

These high stocks curtail price growth in 2021, and prices remain relatively low. Furthermore, some components of oil consumption remain low well into 2021, as aviation demand is curtailed and economic impacts of COVID-19 persist. As a result, prices are forecast to be lower than the baseline case over the rest of the outlook period to December 2022.

Under Scenario 3, Australia’s LNG export earnings are forecast to decline from an estimated $47 billion in 2019–20 to $29 billion in 2020–21 ($6.7 billion lower than in the baseline scenario), before edging up to $29 billion in 2021–22 ($5.3 billion lower than in the baseline scenario).

**Australian LNG export earnings**

While the gas chapter provides point forecasts for Australia’s LNG export earnings, this analysis highlights that these forecasts are underpinned by considerable uncertainty. Based on this scenario analysis, LNG export earnings could fall anywhere between $29 and $37 billion in 2020–21, and $30 and $42 billion in 2021–22, depending on oil prices.
### Table 8.1: Oil Outlook

<table>
<thead>
<tr>
<th>World</th>
<th>Unit</th>
<th>2019</th>
<th>2020(^f)</th>
<th>2021(^f)</th>
<th>2022(^f)</th>
<th>Annual percentage change</th>
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<td></td>
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<td>2020(^f)</td>
<td>2021(^f)</td>
<td>2022(^f)</td>
<td>2020(^f)</td>
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<td>Production(^a)</td>
<td>mb/d</td>
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<td>92.1</td>
<td>98.6</td>
<td>-8.6</td>
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<td>Consumption(^a)</td>
<td>mb/d</td>
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<td>90.6</td>
<td>97.1</td>
<td>100.9</td>
<td>-9.2</td>
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<td></td>
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<tr>
<td>– nominal</td>
<td>US$/bbl</td>
<td>56.7</td>
<td>39.2</td>
<td>40.1</td>
<td>47.8</td>
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<tr>
<td>– real(^b)</td>
<td>US$/bbl</td>
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<td>39.2</td>
<td>39.2</td>
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<td>– nominal</td>
<td>US$/bbl</td>
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<td>42.1</td>
<td>44.9</td>
<td>52.8</td>
<td>-34.1</td>
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<td>– real(^b)</td>
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<td>42.1</td>
<td>44.0</td>
<td>50.5</td>
<td>-35.5</td>
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<td></td>
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<tr>
<td>Crude and condensate</td>
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<tr>
<td>Production(^a)</td>
<td>kb/d</td>
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<td>412</td>
<td>398</td>
<td>392</td>
<td>21.2</td>
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<td>Export volume(^a)</td>
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<td>292</td>
<td>300</td>
<td>299</td>
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<td>– Nominal value</td>
<td>A$m</td>
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<td>8,955</td>
<td>6,798</td>
<td>8,595</td>
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<td>– Real value(^g)</td>
<td>A$m</td>
<td>9,242</td>
<td>8,955</td>
<td>6,666</td>
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<td>Imports(^a)</td>
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<td>LPG production(^ac)</td>
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<td>97</td>
<td>100</td>
<td>101</td>
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<td>– Refinery production(^a)</td>
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<td>– Export volume(^ad)</td>
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<td>12</td>
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<td>– Import volume(^a)</td>
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<td>658</td>
<td>655</td>
<td>685</td>
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<td>– Consumption(^ae)</td>
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<td>1,022</td>
<td>1,045</td>
<td>1,079</td>
<td>-2.2</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 Primary products sold as LPG; d Excludes LPG; e Domestic sales of marketable products, including imports; f Forecast; g In 199–20 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).

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