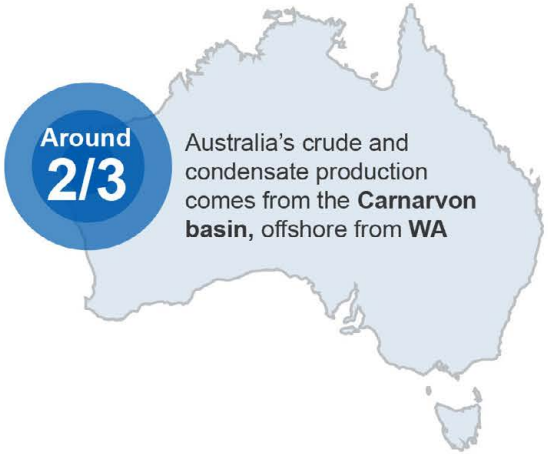
Oil

Resources and Energy Quarterly September 2019

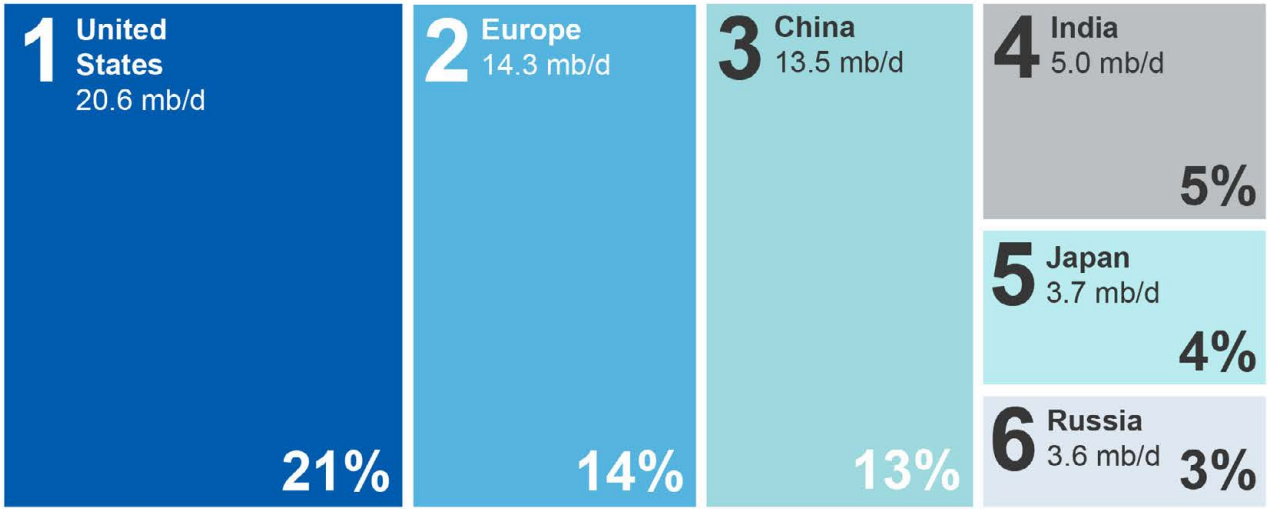


Around 18%
of refinery feedstock is domestically produced, the remainder is imported

In the last 5 years the Brent spot price ranged from
US$26 – US$94
a barrel, and averaged
US$58 a barrel

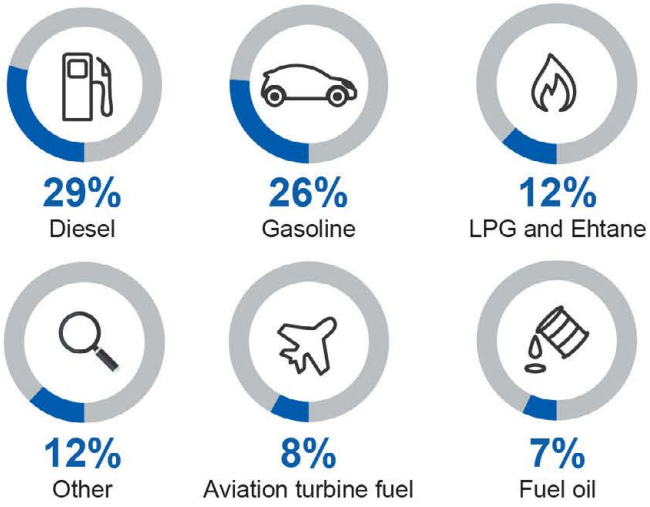
Australia's crude oil, condensate and LPG resources (PJ)

Key consumer markets of oil products (2019 forecast)



Note: Measured in million barrels per day.

World consumption of oil products



8.1 Summary

- Deteriorating world economic conditions have dominated oil markets since May 2019, driving prices to their lowest levels since early January. An attack on Saudi Arabia's oil production facilities on 14 September 2019 shocked markets, adding a risk premium to prices on fears that Saudi oil infrastructure is vulnerable to major disruption.
- Australia's condensate and LPG export volumes are rising and forecast to peak during the outlook period, while crude oil production in 2018–19 reached its lowest level in generations.
- Earnings from crude, condensate and LPG exports are forecast to continue their upward trend, rising from $10.1 billion in 2018–19 to $13.7 billion in 2019–20, before falling slightly to $12.9 billion in 2020–21. The 2019–20 peak reflects expected export volume growth and the impact of a weaker Australian dollar.

8.2 Prices

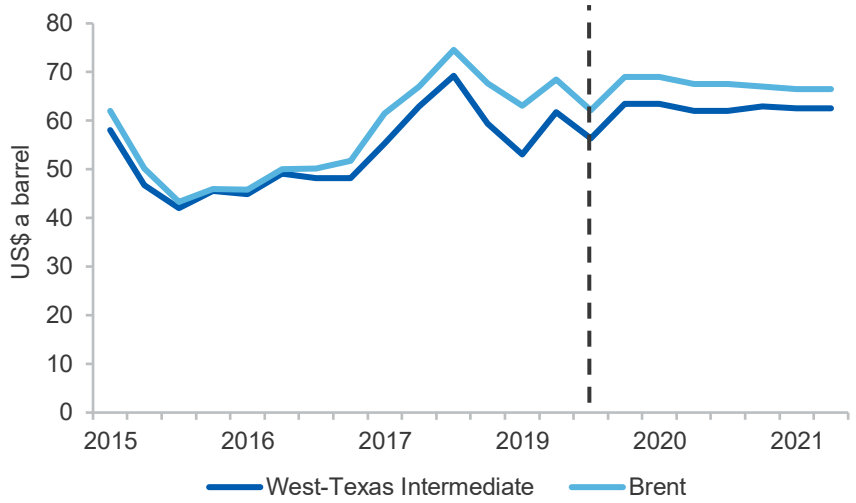
Demand and supply uncertainty in short term

The Brent crude oil benchmark price has moved noticeably lower since its 2019 peak of US$74 a barrel on 16 May 2019. It averaged US$62 a barrel over the September quarter, 10 per cent lower than the June quarter. By contrast, the West Texas Intermediate (WTI) benchmark fell by only 6 per cent, to $56 a barrel, as the gap between Brent and WTI narrowed. Taking a longer term perspective, the average Brent spot price for the September 2019 quarter remains close its average price of US$63 (real 2019 dollars) over the last 5 years. WTI is below its average price of US$59 (real 2019 dollars) over the same period (Figure 8.1).

Price increases in the first half of the year were supported by the curtailment of supply under the 'Vienna Agreement', under which OPEC, Russia, Kazakhstan, Mexico and seven other countries (collectively referred to as 'OPEC+') agreed to reduce crude oil production by 1.2 million barrels a day. Over-compliance with that agreement, as well as unplanned outages in Venezuela and Iran, have offset increased US output. As a result, total world oil production in 2019 is expected to be no higher than 2018. This year will be the first time annual production growth has been at or below zero since 2009. Despite OPEC+ members holding down output, daily spot Brent oil prices plunged by 30 per cent from late May to early August. The plunge reflected signs of weakening oil consumption growth, due to a softening in the US, European and Asian economies, as trade tension impacts were felt in the real economy. The negative mood dominated the behaviour of oil markets, despite estimates indicating that consumption volumes could modestly exceed production this year and next — due to the OPEC+ restrictions and other unplanned outages.

Sentiment turned firmly towards supply risk on 14 September with an attack on two key parts of the oil production infrastructure in Saudi Arabia. News of the attack caused Brent oil futures contracts to rise by $12 a barrel when Asian markets next opened. This was the largest intraday move since the futures contract started trading in 1988. At time of writing, spot prices for both Brent and WTI benchmarks remained elevated at least 5 per cent above their pre-attack levels.

Figure 8.1 Historical and forecast oil prices



Source: Bloomberg (2019); Department of Industry, Innovation and Science (2019)

The 2020 mandate for international shipping to switch to low-sulphur bunker fuel is starting to be felt. Since early August, markets have seen a sharp drop in the price of high sulphur fuel oil relative to low sulphur gasoil, providing an early indication of declining demand for the high sulphur products. As 2020 nears, this demand shift could put upward pressure on the prices of light sweet crude oils — such as the Brent and WTI benchmarks — which suit refining into low sulphur fuels (see June 2019 *Resources and Energy Quarterly*, Box 8.1).

Even with improving world economic growth expected in 2021, elevated production relative to consumption is expected to lead to prices easing over the outlook period. The Brent crude benchmark price is forecast to average US$67 a barrel over the outlook period, down from its 2018 level of $71 a barrel (Figure 8.1).

8.3 World oil consumption

World oil consumption growth is expected to increase at an average annual rate of 1.2 million barrels a day over the outlook period, from 99 million barrels a day in 2018 to 103 million barrels a day in 2021.

This is slower than the average growth of the last three years, and reflects the slowing pace of growth in the world economy, with 2019 growth expected to be particularly slow at 1.1 million barrels a day. This is the second consecutive edition of *Resources and Energy Quarterly* in which consumption growth expectations for 2019 are being revised down, in light of trade tensions and a weakening global economy.

Non-OECD countries are expected to account for all of the growth in world oil consumption over the outlook period, led by China and India. Non-OECD consumption is forecast to reach 55 million barrels a day in 2021, up from a revised figure of 52 million barrels a day in 2018.

By contrast, consumption by the OECD nations is expected to remain steady at 48 million barrels a day over the outlook period. While transport needs continue to expand in these markets, efficiency improvements are offsetting the growth in transportation. Fuel switching will become more relevant to this equation over time as electric vehicles (EV) take a growing share of the new light vehicle market — but the most dramatic growth in EV sales is expected to occur beyond the outlook period (see section 15.2 in *Lithium* chapter).

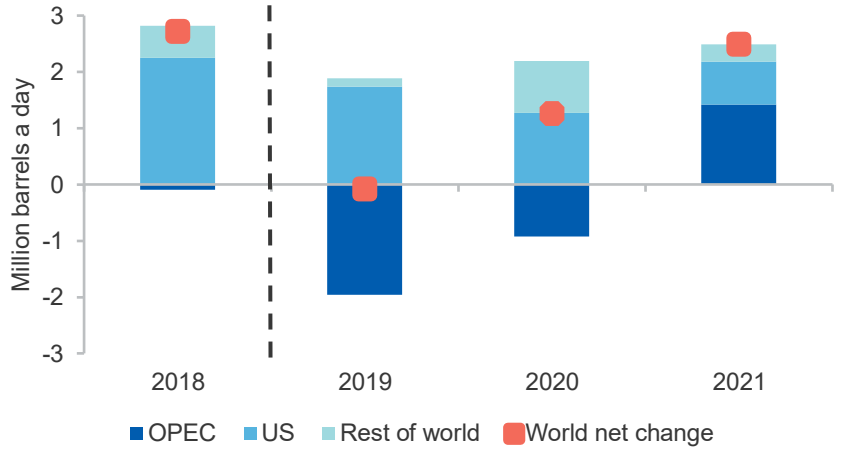
8.4 World oil production

World production growth in 2019 remains on track to be no higher than 2018 levels, due to the success of OPEC+ in limiting output, and the impact of US sanctions on Venezuela and Iran (Figure 8.2).

OPEC+ cuts, unplanned outages and heightened geopolitical risk

OPEC+ total oil (crude and natural gas liquids) production has continued to decline in recent months, reaching 53.7 million barrels a day in August — around its lowest level in over four years. This amounted to a 2.8 million barrel a day reduction on the October 2018 level (the level used as benchmark in the ongoing Vienna Agreement). This large reduction in output was the combination of bigger voluntary cuts than required under

Figure 8.2: Annual change in forecast world oil production by region



Source: IEA (2019); Department of Industry, Innovation and Science (2019)

the Vienna Agreement — and involuntary outages (particularly affecting Iran).

Saudi Arabia's voluntary cuts reduced output by 0.9 million barrels a day, while key partner Russia reduced output by 0.1 million barrels a day, relative to the October 2018 benchmark. Russia's production through August jumped to its highest level in 5 months.

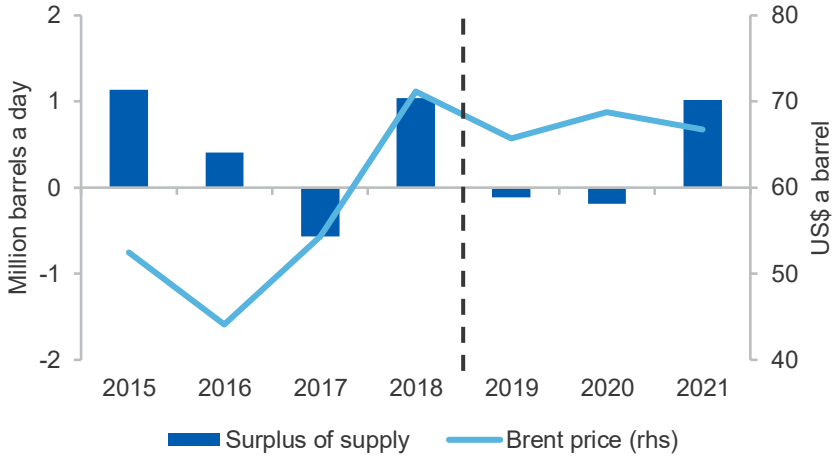
Involuntary cuts have affected the OPEC members exempt from the Vienna Agreement: Iran (output down 1.2 million barrels a day, a 27 per cent decline) and Venezuela (output down 0.5 million barrels a day, a 36 per cent decline). The outlook for these producers, isolated by US sanctions, is for output to fall further. OPEC output is forecast to remain below 2018 levels throughout the outlook period, even assuming an eventual peaceful resolution of tensions between the US and Iran during the outlook period.

Should US sanctions on Iran oil sales be completely lifted in late 2019, Iranian production would be expected to recover quickly through 2020, adding up to an additional two million barrels a day onto a market already expected to be adequately supplied (see Figure 8.3). Venezuela's production is not expected to rebound during the outlook period, even if US sanctions are lifted.

On 14 September 2019 there was an attack on the world's largest crude oil processing facility in Abqaiq, Saudi Arabia, causing fires and extensive damage. The aerial attack simultaneously struck equipment at the Khurais oil field, Saudi Arabia's second largest. These attacks had the potential to disrupt up to 5.7 per cent of the world's oil supply.

In the aftermath of the attacks, the US immediately made its strategic oil reserves available to steady the market. Saudi Arabia also has ample strategic reserves to draw on to supply customers while the damage is repaired. Notwithstanding the availability of reserves to plug temporary shortfalls, the concern of market participants is that the attack revealed Saudi oil production infrastructure to be vulnerable.

Figure 8.3: World oil production, consumption and price forecasts



Notes: Surplus of supply equals annual production volume minus consumption volume.

Source: Bloomberg (2019); Department of Industry, Innovation and Science (2019); International Energy Agency (2019).

If the scale of impact of the attack emboldens further violence, or if the security situation in the region spirals towards armed conflict, then Saudi Arabia could face major involuntary outages over the outlook period. As the world's second largest oil producer — supplying one-eighth of total world production — a major Saudi outage would have large and unpredictable impacts on production and price.

Rapid US growth continues

US oil output is expected to increase by 1.7 million barrels a day in 2019 alone, an 11 per cent rise (Figure 8.2). Although slowing over the outlook period, the US will dominate supply growth on the back of a long period of investment in exploration, rigs and infrastructure. Even with the industry consolidating as a result of increased bankruptcies of smaller companies, and a falling number of active rigs, US production is forecast to increase strongly. Cumulative growth of 25 per cent over the three year outlook period is forecast, reaching 19.3 million barrels a day in 2021, up from 15.5 million barrels a day in 2018.

8.5 Australia's production and trade

Oil export earnings surged 29 per cent in 2018–19

Higher crude and condensate export volumes, higher prices and a weaker Australian dollar combined to drive export earnings up to $9.0 billion in 2018–19, a 31 per cent increase on the previous financial year.

The outlook for crude and condensate remains strong, with production forecast to increase at an average annual rate of 11 per cent, up from 340,000 barrels a day in 2018–19 to 417,000 barrels a day in 2020–21.

Annual earnings from crude and condensate exports are forecast to peak at $11.4 billion in 2019–20, due to rising export volumes and a weaker Australian dollar. Exports are then expected to fall to $10.8 billion in 2020–21 as the Australian dollar recovers from current lows, and as oil prices decline (Figure 8.4).

2018–19 was a bumper year for condensate production, associated with output from new offshore LNG projects. Condensate increased by 52 per cent during the year, more than offsetting the ongoing decline in crude production (Figure 8.5).

Australia's crude oil production at its lowest level in 49 years

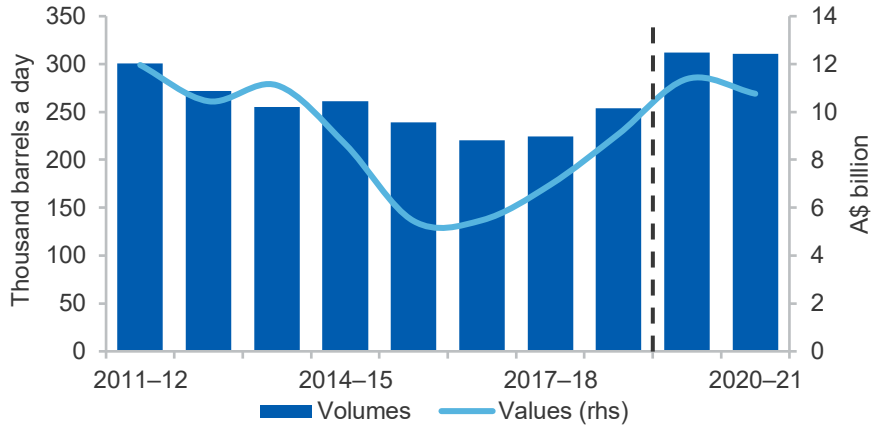
Australian crude oil production averaged 108,000 barrels a day in 2018–19 — this was the lowest annual level since 1969–70. With Woodside's Greater Enfield expansion coming online in Carnarvon in 2019–20, crude production is expected to rise strongly from the current low. Total Australian crude oil production in 2020–21 is forecast to be 21 per cent higher than the 2018–19 level.

Condensate and LPG production up strongly

Condensate output is forecast to grow 10 per cent a year, from 232,000 barrels a day in 2018–19 to 287,000 barrels a day in 2020–21.

In the Browse Basin off the Western Australian coast the recent start-up of Train 1 at INPEX's Ichthys facility has quickly reached full capacity, producing around 70,000 barrels a day during the first two quarters of 2019. Shell's Prelude facility has also commenced some operations and is

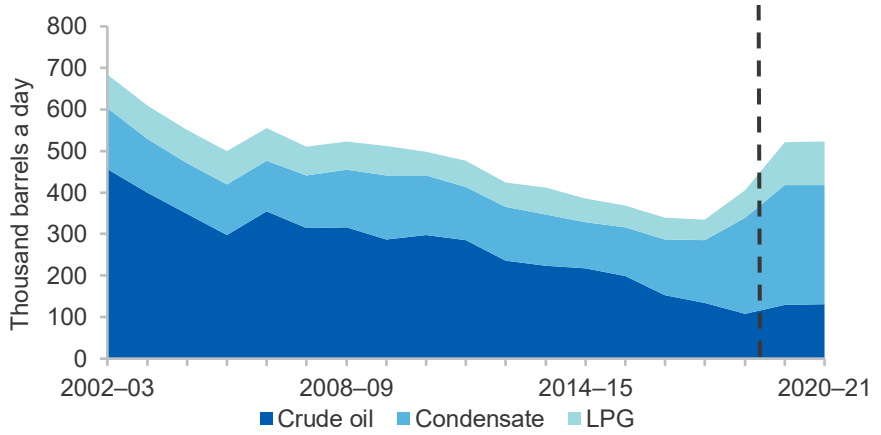
Figure 8.4: Australia's annual oil exports



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

Source: ABS (2018); Department of Industry, Innovation and Science (2019).

Figure 8.5: Quarterly composition of Australia's oil production



Source: EnergyQuest (2019); Australian Petroleum Statistics (2019); Department of Industry, Innovation and Science (2019).

expected to ramp up strongly in the second half of 2019, producing nearly 30,000 barrels a day once it reaches full capacity.

As a result of Ichthys coming online, and of Esso's Gippsland Basin joint venture in the Bass Strait returning from maintenance to normal output, LPG production in the June quarter 2019 was 60 per cent higher year-on-year at 80,000 barrels a day. With Prelude also likely to start producing LPG later in 2019, Australian LPG output is expected to reach 105,000 barrels a day in 2020–21 — an annual average growth rate of 26 per cent from 2018–19.

Exploration expenditure low, but trend could be turning

Exploration expenditure was $378 million in the June quarter 2019, up 20 per cent year-on-year (Figure 8.6). After a decade of decline to reach a low of $1.0 billion in fiscal year 2017-18, exploration expenditure for 2018-19 was higher at $1.3 billion.

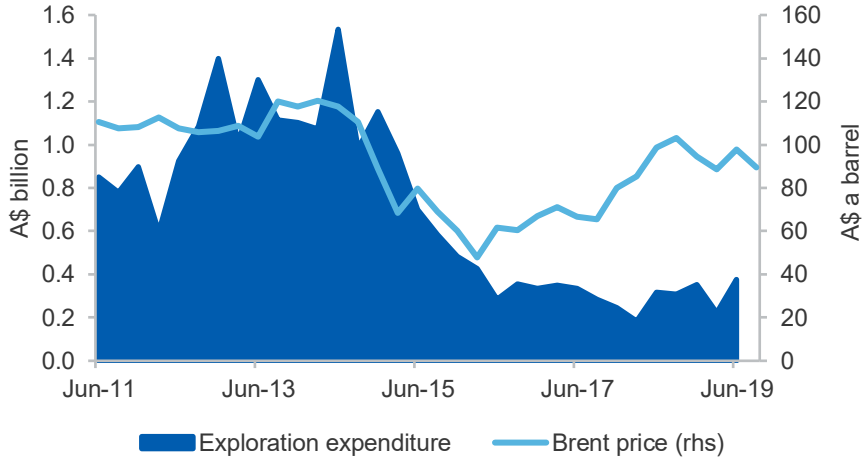
Australia's fuel consumption growth stalls, refinery production steady

Australia's refinery production was 502,000 barrels a day in 2018-19. To meet growing Australian demand, an estimated 61 per cent of refined product consumed in Australia was imported in 2018–19, including 70 per cent of diesel and 36 per cent of automotive gasoline.

The growth in Australia's domestic consumption of oil products fell in the first two quarters of 2019, following the slowing economy. After above-average growth of 3.5 per cent in 2017–18, growth fell to 0.5 per cent in 2018–19, well below the average of the past decade. During the same period, Australian GDP grew by 1.4 per cent — the lowest growth in a decade — and per capita GDP growth was negative. Consumption growth is expected to remain anaemic through 2019, and start to recover with stronger GDP growth from early 2020 (Figure 8.7).

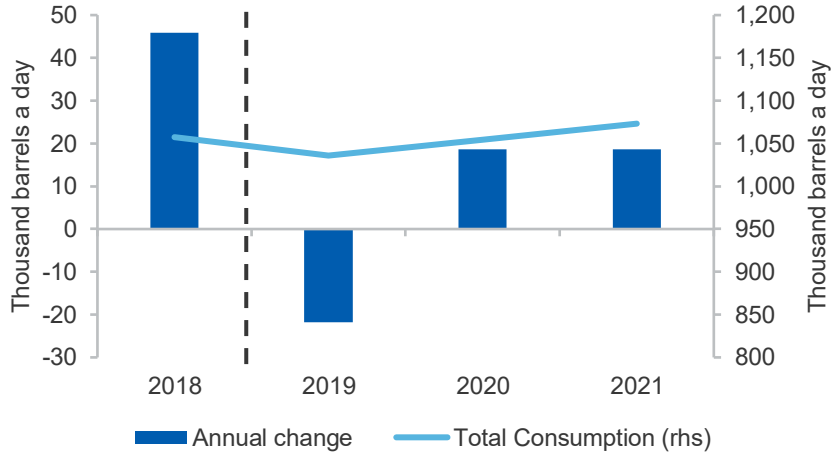
The slowdown is not expected to impact Australia's refineries. Rather, growth in the import of refined oil products is expected to slow in line with slower consumption growth.

Figure 8.6: Quarterly petroleum exploration and A$ oil price



Source: ABS (2019) Mineral and Petroleum Exploration Expenditure, cat. 8412.0, Bloomberg (2019).

Figure 8.7: Annual Australian oil consumption forecasts



Notes: All petroleum products, including gasoline, diesel, aviation fuels, LPG, lubricants.

Source: Australian Petroleum Statistics (2019), Department of Industry, Innovation and Science (2019)

Revisions to the outlook

Since the June 2019 Resources and Energy Quarterly, the world oil consumption outlook has been revised down through the outlook period, including a reduction in the 2019 growth forecast from 1.3 to 1.1 million barrels a day. Historical consumption for 2018 has been revised up from 99.1 to 99.3 million barrels a day on the basis of more accurate sales data.

Revisions have been made to the world production outlook, increasing actual and forecast world production throughout the outlook period. This is driven by higher OECD production (especially for the US and Canada) increasing actual and expected growth rates in 2018 and 2020. In 2021, production is forecast to be 104.0 million barrels a day, higher than forecast in the June 2019 Resources and Energy Quarterly by 0.5 million barrels a day.

Australia's forecast oil export earnings have been revised down by $200 million in 2018–19 and by $600 million in 2019–20, compared to the forecast in the June 2019 Resources and Energy Quarterly. Both revisions are a result of lower realised and forecast oil prices. Export volumes are unchanged.

Table 8.1: Oil outlook

						Annual percentage change		
World	**Unit**	**2018**	**2019[f]**	**2020[f]**	**2021[f]**	**2019[f]**	**2020[f]**	**2021[f]**
Production[a]	mb/d	100.3	100.2	101.6	104.0	-0.1	1.3	2.5
Consumption[a]	mb/d	99.3	100.3	101.6	102.9	1.1	1.3	1.3
WTI crude oil price								
– Nominal	US$/bbl	65.1	58.7	63.3	62.8	-9.9	7.8	-0.8
– Real[b]	US$/bbl	66.5	58.8	61.8	60.0	-11.6	5.1	-2.9
Brent crude oil price								
– Nominal	US$/bbl	71.2	65.7	68.8	66.8	-7.7	4.7	-2.9
– Real[b]	US$/bbl	72.7	65.9	67.2	63.9	-9.4	2.1	-5.0
Australia	**Unit**	**2017–18**	**2018–19**	**2019–20[f]**	**2020–21[f]**	**2018–19[f]**	**2019–20[f]**	**2020–21[f]**
Crude and condensate								
Production[a]	kb/d	286	340	418	417	19.0	22.9	-0.1
Export volume[a]	kb/d	225	254	312	311	13.1	22.8	-0.4
– Nominal value	A$m	6,958	9,079	11,377	10,761	30.5	25.3	-5.4
– Real value[g]	A$m	7,242	9,297	11,377	10,502	28.4	22.4	-7.7
Imports[a]	kb/d	386	375	346	342	-2.9	-7.8	-1.0
LPG production[ac]	kb/d	50	66	103	105	32.9	55.4	2.5
Refined products								
– Refinery production[a]	kb/d	494	502	489	488	1.6	-2.6	-0.2
– Export volume[ad]	kb/d	18	16	17	13	-8.0	5.0	-25.0
– Import volume[a]	kb/d	645	645	661	673	0.0	2.6	1.8
– Consumption[ae]	kb/d	1,040	1,046	1,047	1,061	0.5	0.1	1.4

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 2019 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 2019–20 financial year Australian dollars.

Sources: ABS (2019) cat. 5368.0, International Energy Agency (2019), EnergyQuest (2019), US Energy Information Administration (2019), Department of Environment and Energy (2019), Department of Industry, Innovation and Science (2019).