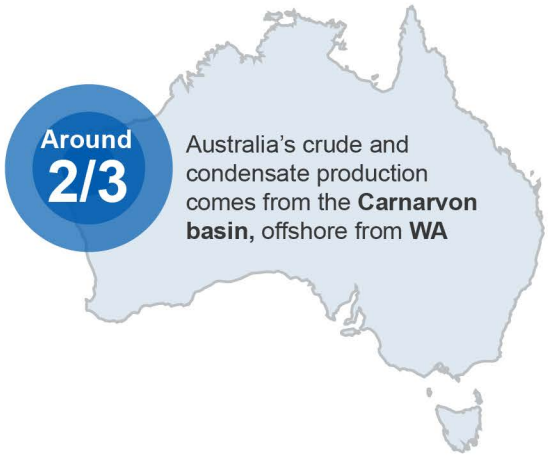
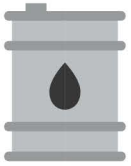
Oil

Resources and Energy Quarterly December 2019



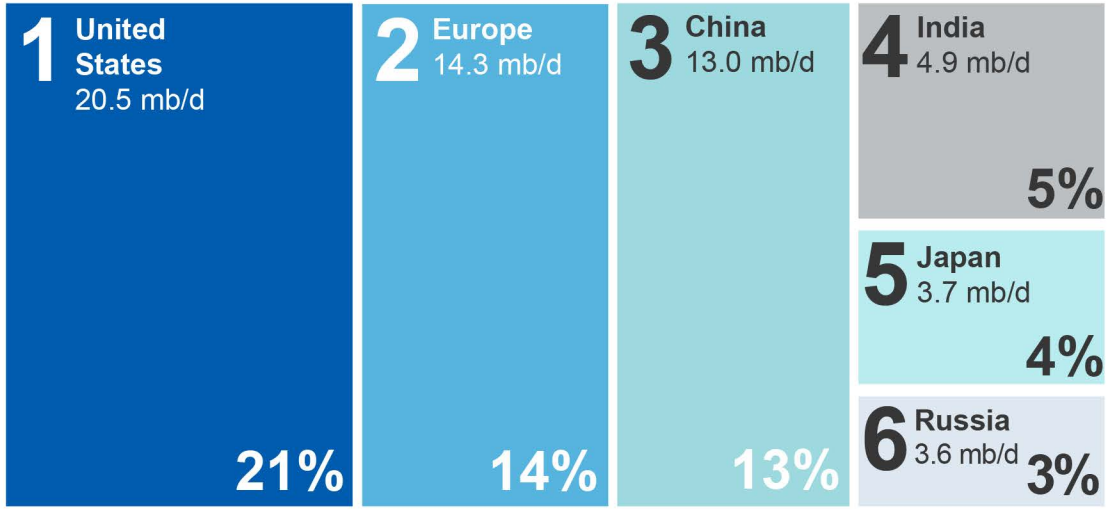
Around 18%
of refinery feedstock is domestically produced, the remainder is imported



In the last 5 years the Brent spot price ranged from
US$26 – US$86
a barrel, and averaged
US$57 a barrel

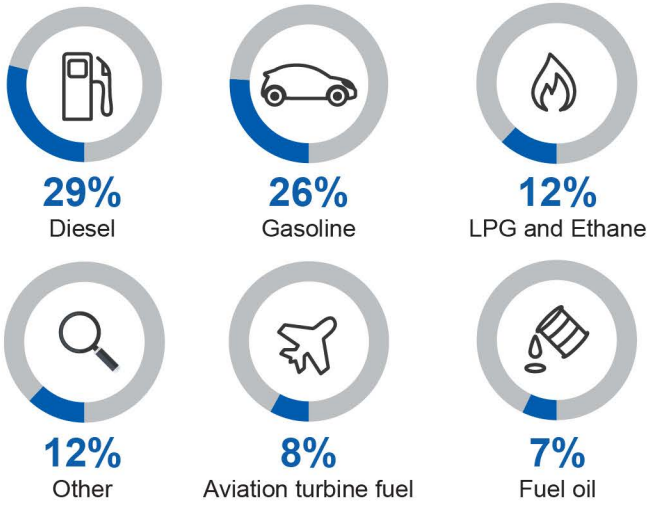
Australia's crude oil, condensate and LPG resources (PJ)

Key consumer markets of oil products (2019 forecast)



Note: Measured in million barrels per day.

World consumption of oil products



8.1 Summary

- Oil prices have fallen in 2019 as a result of slowing economic growth. An attack on Saudi Arabia's oil production facilities on 14 September 2019 temporarily boosted prices. However, as of early December 2019, prices have fallen close to levels before the attack.
- Australia's condensate and LPG export volumes are rising, while crude oil production in 2018–19 fell to its lowest level in many decades.
- Earnings from crude, condensate and LPG exports are forecast to continue their upward trend, rising from $9.1 billion in 2018–19 to $11 billion in 2019–20, before falling marginally to $10 billion in 2020–21. The 2019–20 peak reflects expected growth in export volumes and the impact of a weaker Australian dollar.

8.2 Prices

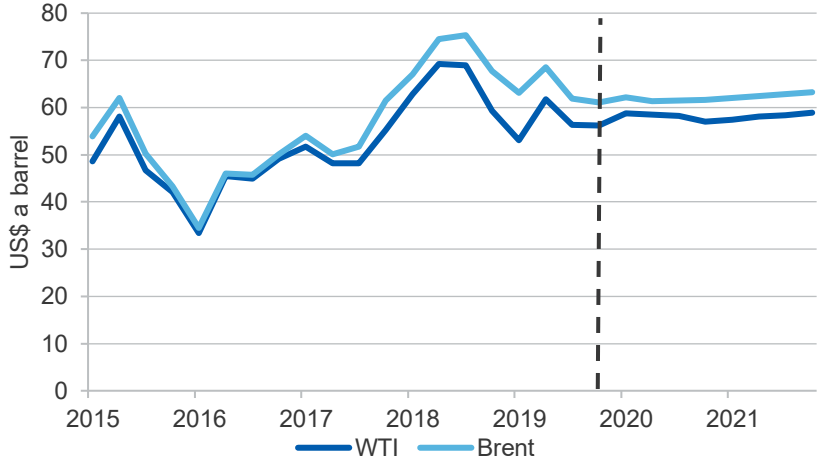
Prices falling despite attack on Saudi oil infrastructure and OPEC+ cuts

The Brent crude oil benchmark price has fallen during 2019. Oil averaged US$61 a barrel over the December quarter, 10 per cent lower than the December 2018 quarter. The West Texas Intermediate (WTI) benchmark fell by 4.9 per cent to US$56 a barrel, and the gap between Brent and WTI narrowed. Compared to historical averages, the average Brent spot price for the December 2019 quarter is slightly lower than its 5 year average of US$63 (real 2019 dollars). WTI is also slightly below its average price of US$59 (real 2019 dollars) over the same period (Figure 8.1).

Price gains in the first half of the year were driven by output cuts agreed under the 'Vienna Agreement', by which OPEC, Russia, Kazakhstan, Mexico and seven other countries (collectively referred to as 'OPEC+') agreed to cut crude oil output by 1.2 million barrels a day. Due to Saudi over-compliance with this agreement and unplanned outages in Venezuela and Iran, 2019 world output is forecast to fall for the first time in a decade.

Lower global production has not resulted in prices increasing; instead, prices plunged between May and November, driven by softening expectations for oil consumption growth. Falling prices prompted OPEC+ to agree to cut output by a further 500,000 barrels a day on 6 December 2019. As of 9 December 2019, the impact on prices is still uncertain. These output cuts are only for the first quarter of 2020 in an attempt to limit the impact of seasonally low consumption on prices. This is expected to increase prices moderately during the first half of 2020, although the possibility that OPEC+ extends cuts beyond March would increase prices later in the outlook period. Prices would also rise if compliance increases in certain OPEC+ countries, particularly Iraq and Nigeria.

Figure 8.1 Historical and forecast oil prices



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

Trade tensions have also weighed on global economic growth, and consequently oil demand, in 2019. Demand growth is expected to be especially sluggish in most OECD nations. Forecasts of slowing growth in oil demand has put downward pressure on prices throughout 2019.

The impacts of the 14th of September attack on two key parts of oil production infrastructure in Saudi Arabia have largely dissipated. News of the attack initially caused Brent oil futures contracts to rise by US$12 a barrel when Asian markets opened. This was the largest intraday move since the futures contract started trading in 1988. Over the December

quarter, prices fell to be marginally higher than pre-attack levels at the time of writing.

The International Maritime Organisation 2020 mandate for international shipping to switch to low-sulphur bunker fuel is widening the premium of low sulphur gasoil over high sulphur fuel oil. This premium has widened throughout 2019, indicating that the demand for the high sulphur products has declined even before the mandate is imposed. This ongoing demand shift is likely to put upward pressure on the prices of light sweet crude oils — such as the Brent and WTI benchmarks, both of which suit refining into low sulphur fuels (see June 2019 *Resources and Energy Quarterly*, Box 8.1).

Despite OPEC+ agreeing to deeper output cuts, elevated global production relative to consumption is expected to cause prices to ease over the outlook period. The Brent crude benchmark price is forecast to fall marginally, to average US$64 a barrel in 2020 and US$63 a barrel in 2021. This is down from its average 2018 level of US$71 a barrel (Figure 8.1).

8.3 World oil consumption

Moderate consumption growth expected

2019 oil consumption growth is expected to fall marginally to 1.0 million barrels a day, as a result of lower OECD consumption. This is below the long-term average, and this edition of the *Resources and Energy Quarterly* is the third in a row in which 2019 consumption growth forecasts have been revised downwards.

Over the outlook period, world oil consumption growth is expected to increase at an average annual rate of 1.2 million barrels a day, from 99 million barrels a day in 2018 to around 103 million barrels a day in 2021. This growth is 23 per cent lower than the 5 years to 2018, mirroring the slowing pace of growth in the world economy.

Non-OECD countries are expected to account for nearly all of the growth in world oil consumption. Most of this growth is expected to come from China and India. Growing demand in these two countries is expected to underpin global import demand. Over the outlook period, non-OECD consumption is forecast to rise from 51 million barrels a day in 2018 to reach 55 million barrels a day in 2021.

OECD consumption growth is expected to remain steady over the outlook period following an expected decline in 2019. US consumption is forecast to increase only marginally. As a result, a higher share of US production is expected to be exported. OECD fuel consumption is expected to remain steady, because efficiency improvements are expected to fully offset growing transport demand. Fuel switching will become increasingly important over time as electric vehicles (EV) take a growing share of the new light vehicle market. However, the largest growth in EV sales is expected to occur beyond the outlook period.

8.4 World oil production

World production in 2019 is expected to fall, due to the success of the Vienna Agreement in limiting output, and the impact of US sanctions on Venezuela and Iran (Figure 8.2). Over the outlook period, production is forecast to increase primarily because of higher US output.

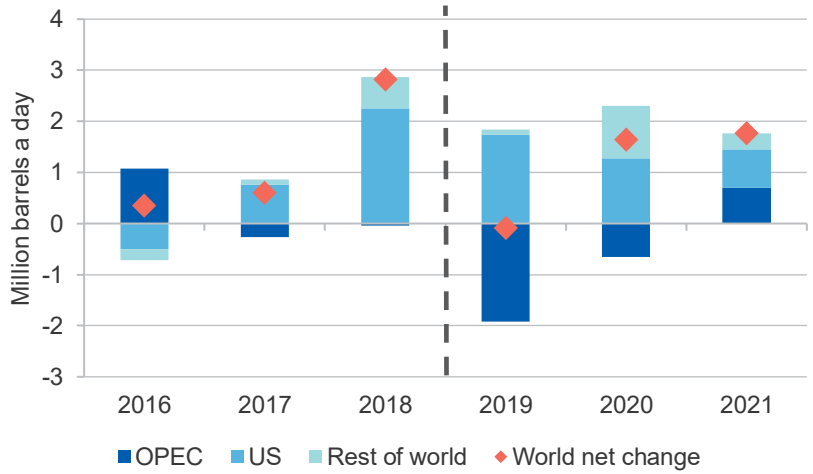
OPEC+ cuts and unplanned outages reducing global output

OPEC+ total oil (crude and natural gas liquids) output has fallen over 2019, declining to 54 million barrels a day in October 2019. This is 2.8 million barrels a day lower than the October 2018 production level which is used as the Vienna Agreement benchmark. The 2019 reduction exceeds the voluntary cuts under the Vienna Agreement, primarily due to over-compliance by Saudi Arabia.

In October 2019, Saudi Arabia reduced output by 0.4 million barrels a day in comparison to October 2018 to support prices before the Saudi Aramco initial public offering (IPO) in December 2019. As of 9 December 2019, the Saudi Aramco IPO raised over US$29 billion, making it the largest IPO in history. Over the outlook period, Saudi Arabia is expected to continue producing less than their OPEC+ targets.

On 14 September 2019, a terrorist attack on Saudi Arabian oil infrastructure caused fires and extensive damage. This reduced Saudi production by 8.2 per cent month-on-month in September. This disruption has proven to be temporary, with October production increasing by 13 per cent to be greater than August production. Nonetheless, this attack has highlighted risks of vulnerabilities in Saudi oil production infrastructure. Russian production in October 2019 fell to 11 million barrels a day. This is 2 per cent lower than October 2018 and is close to Russia's output target under the Vienna Agreement. Production is forecast to fall in 2020 as Russia is expected to fully comply with the targets from the December 2019 deal.

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



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

Over the outlook period OPEC+ production is forecast to remain lower than 2018 in volume terms. 2020 output is expected to fall in line with the output targets agreed to in the December 2019 deal. Since these output targets are assumed to be temporary, production in 2021 is forecast to increase year-on-year.

US sanctions affecting global production

Involuntary cuts have affected the OPEC members exempt from the Vienna Agreement: Iran (output down 38 per cent to 2.1 million barrels a day) and Venezuela (output down 50 per cent to 0.7 million barrels a day). Both declines are due to US sanctions, and further falls are expected in the short-term. OPEC output is forecast to remain below 2018 levels throughout the outlook period, irrespective of whether production recovers in Iran.

However, should US sanctions on Iran oil ease in the near future, Iranian production would likely recover quickly, adding up to two million barrels a day into a market where prices are already falling.

Venezuela's production is not expected to rebound during the outlook period, even if US sanctions are lifted. For production to increase, significant investment in Venezuelan oil infrastructure is required.

Rapid US output growth continues

US oil output in 2019 is expected to increase by 1.6 million barrels to 17 million barrels a day (Figure 8.2). This is 133 per cent of the amount that OPEC+ agreed to decrease production by in the Vienna Agreement. Over the outlook period, growth in US shale oil production is expected to moderate, while remaining the key driver of higher global production. Production is forecast to reach 19 million barrels a day in 2021, up from 15 million barrels a day in 2018.

Other non-OPEC output expected to increase marginally

Over the outlook period, production in other non-OPEC countries is expected to increase from 2018 levels. Between 2019 and 2021, Norway's production is forecast to increase from 1.7 million barrels a day to 2.3 million barrels a day. Production growth is expected to be minimal in Canada and the UK.

Box 8.1: Long-term outlook for oil

In November 2019, the International Energy Agency (IEO) released their annual World Energy Outlook (WEO) publication. The WEO contains forecasts for the global energy sector to 2040 under three policy scenarios. The outlook for oil varies substantially across these policies, indicating the significant influence of government policies on the oil sector.

Long-term forecasts

In the Stated Policies Scenario, oil consumption grows by 10 per cent to reach 106 million barrels per day in 2040. Consumption does not peak before 2040, although the growth rate slows considerably after 2025. Much of this slowdown occurs in China. Nonetheless, China is expected to become the world's largest oil consumer, due to falling US usage. In the Current Policies Scenario, global oil consumption continues to rise, reaching 121 million barrels per day in 2040. Under the Sustainable Development Scenario, consumption begins decreasing over the short-term and falls dramatically to 67 million barrels per day.

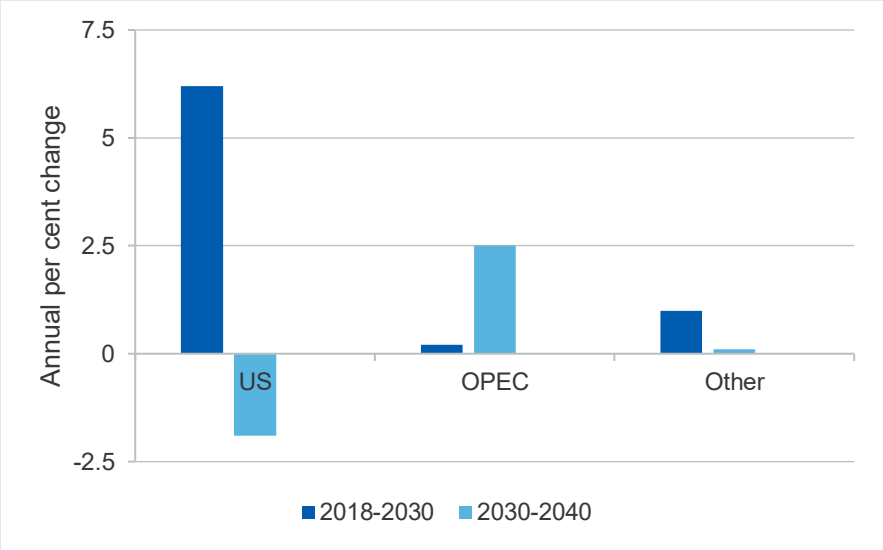
Across all scenarios, the US share of global oil production is forecast to increase significantly to 2030. As a result, the US is projected to become the largest gross oil exporter. This will reduce OPEC's ability to influence global prices. From 2030, the share of global production from OPEC increases due to ongoing investment in new supply sources (Figure 8.4).

Global oil prices are forecast to rise in real terms under the Stated Policies Scenario. This growth rate increases in the Current Policies Scenario with prices under the sustainable development scenario falling marginally.

Risks to the forecasts

The IEA also highlighted ongoing risks to the sector. This includes the strategic importance of trade chokepoints, particularly the Strait of Hormuz and the Strait of Malacca. In all scenarios, trade passing through the Strait of Hormuz remains high through to 2040 and any impediment to shipments would materially affect markets and render most OPEC spare capacity unavailable.

Figure 8.3: Production growth forecast in the Stated Policies Scenario



Note: The Current Policies Scenario considers the impact of policies and measures that are firmly enshrined in legislation as of mid-2019. The Stated Policies Scenario (previously known as the New Policies Scenario) incorporates the likely effects of current and announced policies, including official targets. The Sustainable Development Scenario entails a pathway consistent with the Sustainable Development Goals and Paris Agreement.

Trade passing through the Strait of Malacca is projected to increase. Growing traffic, in combination with the narrow nature of the Strait of Malacca, poses major risks to global oil supply chains.

Another source of uncertainty is the future of electric vehicles. In the stated policies scenario, there are a projected 330 million electric cars on the road in 2040. This is expected to reduce oil consumption by 4 million barrels per day. The IEA notes that the outlook for electric vehicles is unclear and dependent on consumer preferences. A fundamental assumption in the WEO is that the current rising popularity of sports utility vehicles ends. This is crucial to the outlook for oil demand, since these vehicles are generally less fuel-efficient and harder to electrify.

8.5 Australia's production and trade

Oil export earnings to peak in 2019–20

In 2018–19, the value of Australian exports rose by 31 per cent to $9.0 billion. The rise was due to higher crude and condensate export volumes, higher prices and a weaker Australian dollar.

The outlook for crude and condensate remains strong, with production in 2019–20 forecast to increase by 28 per cent to 436,000 barrels a day. Production in 2020–21 is forecast to increase marginally to 443,000 barrels a day.

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).

Annual earnings from crude and condensate exports are forecast to peak at $11 billion in 2019–20, with rising export volumes and a weaker Australian dollar more than offsetting falling world prices. Exports are then expected to fall marginally to $10 billion in 2020–21 as the Australian dollar recovers from current lows and oil prices decline further (Figure 8.6).

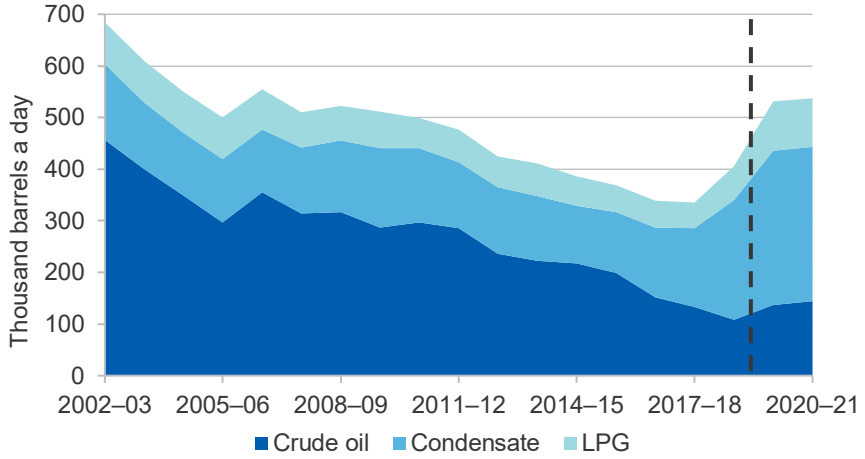
Australia's crude oil production to recover from low levels

Australian crude oil production averaged 108,000 barrels a day in 2018–19 — this was the lowest annual level since 1969–70. Australian production is expected to rebound over the projection period, primarily due to Woodside's Greater Enfield project. This field first produced oil in August 2019 and is expected to ramp up production over the coming years. Total Australian crude oil production in 2020–21 is forecast to be 33 per cent higher than 2018–19.

Condensate and LPG production up strongly

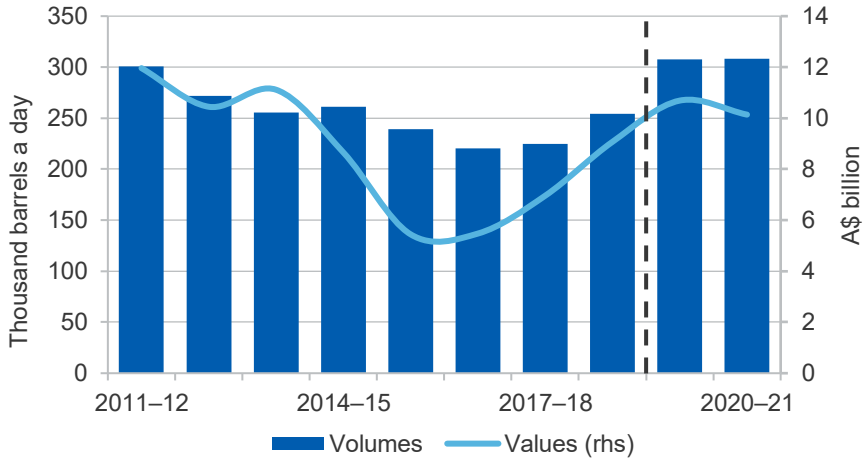
In 2019–20, condensate output is forecast to reach 297,000 barrels a day, 10 per cent higher than 2018–19. Growth is expected to moderate in 2020–21, with production falling to 299,000 barrels a day.

Figure 8.4: Quarterly composition of Australia's oil production



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

Figure 8.5: Australia's annual oil exports



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

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

In the Browse Basin, the recent start-up of Train 1 at INPEX's Ichthys facility has seen production quickly reach full capacity, with output of about 70,000 barrels a day during the first half of 2019. Shell's Prelude facility has also commenced operations and is currently ramping up production.

LPG production in the September quarter 2019 was 43 per cent higher year-on-year at 91,000 barrels a day. This is due to additional Ichthys and Prelude production, and a return to normal output at Esso's Gippsland Basin joint venture in the Bass Strait following maintenance. In 2020–21, Australian LPG output is expected to reach 95,000 barrels a day, 43 per cent higher than 2018–19.

Exploration

In the September 2019 quarter, petroleum exploration expenditure was $378 million, 17 per cent higher year-on-year (Figure 8.6). Exploration has begun to recover from the six-year lows recorded in 2017–18. Exploration has picked up noticeably in Western Australia, suggesting that producers may be looking to backfill large-scale LNG projects (see *Major Projects* chapter).

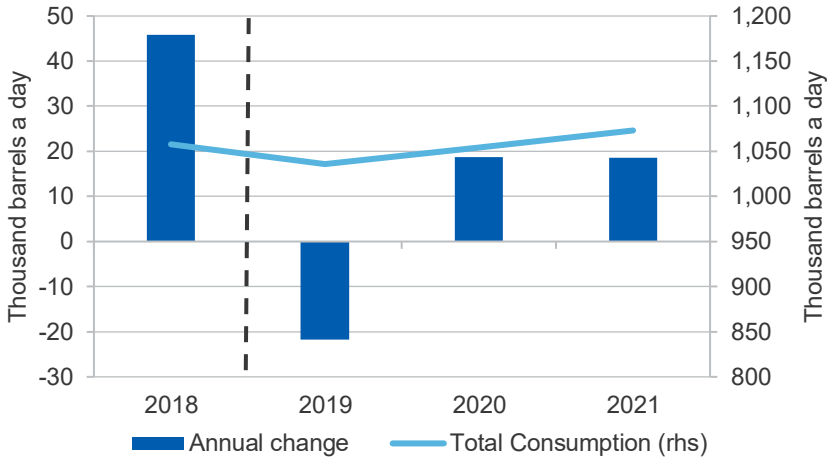
Australia's fuel demand growth stalls, but refinery output remains steady

Australia's refinery production was 502,000 barrels a day in 2018-19. The share of Australia's consumption from imported product has increased over time, and was estimated to reach 61 per cent of refined product in 2018–19. The share of consumption from imported product was estimated to be 70 per cent for diesel and 36 per cent for automotive gasoline.

Australian consumption growth fell from 3.5 per cent in 2017–18 to 0.5 per cent in 2018–19. This is due to slowing economic growth, consistent with trends in other OECD countries. Consumption growth is forecast to recover somewhat over the outlook period, but to remain low (see Figure 8.7).

Slowing consumption is expected to be primarily reflected in the amount of Australian imports rather than domestic production.

Figure 8.6: 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 September 2019 *Resources and Energy Quarterly*, Australian export earnings have been revised down for 2019–20 and 2020–21. This largely reflects downward revisions to global prices. Marginally lower exchange rate forecasts will partially offset lower forecast global prices.

Table 8.1: Oil outlook

World	Unit	2018	2019[s]	2020[f]	2021[f]	Annual percentage change 2019[s]	2020[f]	2021[f]
Production[a]	mb/d	100.4	100.3	101.9	103.7	-0.1	1.6	1.7
Consumption[a]	mb/d	99.3	100.3	101.5	102.8	1.0	1.2	1.3
WTI crude oil price								
– nominal	US$/bbl	65.1	56.8	58.1	58.2	-12.7	2.3	0.2
– real[b]	US$/bbl	66.2	56.8	56.9	55.9	-14.2	0.2	-1.9
Brent crude oil price								
– nominal	US$/bbl	71.2	64.0	63.7	62.9	-10.1	-0.4	-1.3
– real[b]	US$/bbl	72.4	64.0	62.4	60.3	-11.6	-2.5	-3.3
Australia	**Unit**	**2017–18**	**2018–19**	**2019–20[f]**	**2020–21[f]**	**2018–19**	**2019–20[f]**	**2020–21[f]**
Crude and condensate								
Production[a]	kb/d	286	340	436	443	19.0	28.3	1.5
Export volume[a]	kb/d	225	254	308	308	13.1	21.1	0.3
– Nominal value	A$m	6,958	9,071	10,689	10,138	30.4	17.8	-5.2
– Real value[g]	A$m	7,195	9,228	10,689	9,949	28.3	15.8	-6.9
Imports[a]	kb/d	386	375	338	342	-2.9	-9.7	1.1
LPG production[ac]	kb/d	50	66	95	95	32.9	43.9	-0.3
Refined products								
– Refinery production[a]	kb/d	494	502	485	488	1.6	-3.5	0.7
– Export volume[ad]	kb/d	20	17	18	13	-14.7	2.3	-28.4
– Import volume[a]	kb/d	645	645	651	662	0.0	0.9	1.7
– Consumption[ae]	kb/d	1,040	1,046	1,058	1,073	0.5	1.2	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; **s** estimate.

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).