Oil
Resources and Energy Quarterly December 2018

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

- Crude
- Condensate
- LPG
- Total

Key consumer markets of oil products

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Consumption (mb/d)</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>United States</td>
<td>20</td>
<td>21%</td>
</tr>
<tr>
<td>2</td>
<td>Europe</td>
<td>14</td>
<td>14%</td>
</tr>
<tr>
<td>3</td>
<td>China</td>
<td>13</td>
<td>13%</td>
</tr>
<tr>
<td>4</td>
<td>India</td>
<td>4.8</td>
<td>5%</td>
</tr>
<tr>
<td>5</td>
<td>Japan</td>
<td>3.8</td>
<td>4%</td>
</tr>
<tr>
<td>6</td>
<td>Russia</td>
<td>3.4</td>
<td>3%</td>
</tr>
</tbody>
</table>

Note: Measured in million barrels per day.

World consumption of oil products

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

- After price volatility in the December quarter, oil prices are expected to settle over the outlook period as production increases balance consumption growth. The Brent crude oil spot price is forecast to average US$72 a barrel in 2020.
- Australia’s petroleum export volumes are forecast to increase from 226 thousand barrels a day in 2017–18 to 319 thousand barrels a day in 2019–20, supported by new LNG-related condensate capacity.
- Higher volumes growth is expected to support export earnings growth over the outlook period. Export earnings are forecast to rise from $7.0 billion in 2017–18 to $11 billion in 2019–20.

8.2 Prices

Fears of oil shortages addressed by record production

A dramatic quarter of oil price movements reflected expectations about world production shortages, which did not come to pass. In early October, the Brent spot price reached its highest point in four years, at US$86 a barrel (Figure 8.1). This price spike was supported by fears of production shortages due to renewed sanctions by the US against Iran, continued low Venezuelan production and falling OECD stocks. Since that point, prices have decreased sharply — to under US$60 a barrel in November — driven by significant production increases from Saudi Arabia, Russia and the US. Prices fell as fears of market shortages dissipated: production increases dampened the effect of reduced Iranian exports, as did US waivers that were granted to a number countries importing oil from Iran.

Higher oil production and lower consumption growth to weigh on prices

The Brent crude spot price is estimated to average $72 a barrel over the next two years (Figure 8.2). The renewed OPEC and non-OPEC production agreement is expected to bring certainty to the market and support oil prices.

In addition to production uncertainties, a number of demand risks remain for oil prices: lower economic growth, particularly in China, could lower consumption growth and push prices lower.
8.3 World oil consumption

Oil consumption is expected to increase at an average annual rate of 1.3 per cent over the outlook period, from 99 million barrels a day in 2018 to a forecast 102 million barrels a day in 2020. There are a number of factors weighing on current and medium term consumption: lower economic growth, currency devaluations in oil-importing countries and consumer resistance to higher oil prices, as well energy efficiency improvements and fuel switching.

Oil consumption growth driven by Asia over the outlook

Non-OECD countries are expected to account for all of the growth in oil consumption over the outlook period, with non-OECD consumption forecast to reach 54 million barrels a day in 2020. Consumption in China is expected to reach 14 million barrels a day, increasing at an average annual rate of 3.7 per cent. In India, consumption is forecast to increase at an annual rate of 4.5 per cent, reaching 5.2 million barrels a day in 2020. OECD consumption is expected to be stagnant over the outlook period, as consumption increases are outweighed by efficiency improvements.

Box 8.1: Market impacts of regulatory changes on marine shipping

The International Maritime Organisation has introduced a new regulation to address sulphur oxide emissions in the shipping industry. This regulation, due to be introduced in 2020, will limit the sulphur content of shipping fuel to 0.5 per cent, from the current level of 3.5 per cent.

The regulation can be complied with by using low-sulphur fuel, or marine gasoil, rather than high-sulphur fuel. Equipment investments like installing gas cleaning systems (scrubbers), can be undertaken to meet the regulatory requirements. The regulatory change could also encourage a small shift to using LNG as a shipping fuel.

This regulation is expected to change the demand dynamics for refined products, with a significant and sudden increase in low-sulphur fuel oil and marine gasoil consumption. This change could result in higher prices for these products, as well as refinery feedstocks and diesel. Regardless of which compliance method is chosen, shipping costs are expected to increase.

Box 8.2: The outlook for oil consumption in road transportation

Road transport is the largest consumption market for oil, and changes in technology, environmental standards and government policies will have a significant influence on how consumption changes over the long term. Road transport and vehicle ownership is expected to continue its growth trajectory, particularly in China, India and the Middle East. In the IEA’s latest World Energy Outlook, the share of oil used in road transport decreases across all scenarios. In the New Policies Scenario, which includes current and announced policies, oil used in car transport will not change significantly. This is despite expanding vehicle numbers (up 80 per cent by 2040) and higher consumption in non-OECD economies. Improvements in fuel efficiency, and to a lesser extent, substitution to alternative fuels contribute to stagnant consumption growth. Consumption in truck transport is projected to increase.

Oil currently fuels 92 per cent of transport activity. In the New Policies Scenario, this share is projected to fall to 82 per cent by 2040 (Figure 8.3). The IEA’s Sustainable Development Scenario projects what would be required to achieve the Paris Agreement goals and universal energy access. Under this scenario the share of oil in transport falls to 60 per cent in 2040.

Figure 8.3: IEA New Policies Scenario: Fuel used in transport

8.4 World oil production

Oil production is forecast to increase modestly over the outlook period, increasing from almost 100 million barrels a day in 2018 to 102 million barrels a day in 2020.

In the US, improving well-efficiency continues to support growth, despite some infrastructure capacity constraints. The US is currently the largest producer in the world and is expected to drive production growth in the short-term (Figure 8.4). After growth in 2018, US production is forecast to increase at an average annual rate of 6.0 per cent, to reach 17 million barrels a day in 2020.

OPEC+ production increases outweigh losses from Iran and Venezuela

In the second half of 2018, OPEC production reached the highest level in almost two years, as Saudi Arabia increased output to counter losses from other producers. OPEC production was also boosted by Nigeria and Libya, and non-OPEC member Russia (Figure 8.5). The OPEC+ Production Agreement, which limits the output of each producer, has been in place for two years. In December, OPEC and other major producers agreed to production cuts of 1.2 million barrels a day for the first half of 2019; OPEC production is expected to lower by 0.8 million barrels a day, and non-OPEC production by 0.4 million barrels a day.

Sanctions on Iran have begun, but impacts are still to be felt

The reintroduction of US sanctions on Iran has been a significant influence on the oil market in 2018, fostering concerns of world production shortages. The sanctions, intended to cease Iran’s oil exports, came into effect in November.

Prior to the sanctions being introduced, Iran’s oil exports had been steadily increasing over 2018, to reach 1.8 million barrels a day in October. The US has granted import waivers to a number of countries, including China, India and Korea, allowing them to maintain a portion of imports for the next six months. It is unclear how significant the impact of the sanctions will be on world oil markets. Iran is currently excluded from the OPEC production controls.

Figure 8.4: Annual change in world oil production

Figure 8.5: OPEC production and Iran’s production under sanctions
8.5 Australia’s production and trade

Export earnings supported by oil prices and higher condensate output

Crude and condensate export earnings continued to grow in the September quarter, supported by higher oil prices and increased condensate volumes. Export earnings were $2.1 million in the September quarter, up 37 per cent over the year.

Over the outlook period, export earnings are expected to increase by almost 60 per cent, from $7.0 billion in 2017–18 to a forecast $11 billion in 2019–20 (Figure 8.6).

Figure 8.6: Australia’s petroleum export volumes and values

Lower crude oil production outweighed by condensate production

Australia’s petroleum production increased slightly in September quarter, up 2.3 per cent over the year as steep declines in oil production were outweighed by increases in condensate production. The growth in condensate production has been considerable. In the September quarter last year, crude oil and condensate production were roughly equal. Current condensate output is twice as big as crude oil. Some recent decreases in crude production are expected to be temporary. Planned maintenance at BHP’s Pyrenees operations lowered production. At Woodside’s Vincent and Enfield fields, production has temporarily ceased, in preparation for the Greater Enfield expansion. This project has a nameplate capacity of 40 thousand barrels a day and is expected to come online in 2019.

Growing condensate output is expected to drive Australia’s petroleum production, and export earnings, going forward. Production is expected to increase at an average annual rate of 17 per cent over the outlook period, from 286 thousand barrels a day in 2017–18 to 392 thousand barrels a day in 2019–20 (Figure 8.7). In the September quarter new condensate production came online with the start-up of Train 1 at Inpex’s Ichthys facility. Ichthys has a nameplate capacity of 100 thousand barrels a day of condensate, and Train 2 is expected to come online in 2019. Shell’s Prelude facility has a nameplate capacity of 36 thousand barrels a day of condensate, which, at the time of writing was not operating. LPG production is also expected to increase over the outlook period, with strong production from a number of projects related to the Ichthys and Prelude projects.

Figure 8.7: Australia’s petroleum production outlook update

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

Source: EnergyQuest (2018); Australian Petroleum Statistics (2018); Department of Industry, Innovation and Science (2018)
Revisions to export earnings

Since the September Resources and Energy Quarterly Petroleum export earnings have been revised up by $412 million in 2018–19 and $56 million in 2019–20. A downward revision to the Australian exchange rate has supported an increase in forecast export earnings for petroleum products.

Australia’s exploration expenditure

Petroleum exploration expenditure was $308 million in the September quarter, which was slightly lower than the previous quarter and 8.6 per cent higher over the year (Figure 8.9).

Higher oil prices and expectations about future consumption growth have incentivised a recent uptick in exploration activity, although it remains below the historical trend.
Table 8.1: Oil outlook

<table>
<thead>
<tr>
<th>World</th>
<th>Unit</th>
<th>2017</th>
<th>2018(^f)</th>
<th>2019(^f)</th>
<th>2020(^f)</th>
<th>Annual percentage change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production(^a)</td>
<td>mb/d</td>
<td>97.5</td>
<td>99.4</td>
<td>101.1</td>
<td>102.4</td>
<td>2.0</td>
</tr>
<tr>
<td>Consumption(^b)</td>
<td>mb/d</td>
<td>97.9</td>
<td>99.2</td>
<td>100.6</td>
<td>101.6</td>
<td>1.3</td>
</tr>
</tbody>
</table>

WTI crude oil price

- Nominal US$/bbl | 50.8 | 67.5 | 68.1 | 66.6 | 32.8 | 0.8 | –2.1 |
- Real\(^b\) US$/bbl | 52.1 | 67.5 | 66.6 | 64.4 | 29.6 | –1.4 | –3.2 |

Brent crude oil price

- Nominal US$/bbl | 54.3 | 72.4 | 73.0 | 71.5 | 33.1 | 0.9 | –2.1 |
- Real\(^b\) US$/bbl | 55.7 | 72.4 | 71.4 | 69.1 | 29.9 | –1.3 | –3.2 |

Australia

|------|---------|---------|---------------|---------------|---------------|---------------|---------------|
| Crude and condensate
| Production\(^a\) | kb/d | 283 | 286 | 326 | 392 | 1.2 | 13.8 | 20.3 |
| Export volume\(^a\) | kb/d | 221 | 226 | 264 | 319 | 2.6 | 16.7 | 20.7 |
| Nominal value | A$m | 5,476 | 6,959 | 9,896 | 11,255 | 27.1 | 42.2 | 13.7 |
| Real value\(^g\) | A$m | 5,710 | 7,119 | 9,896 | 10,989 | 24.7 | 39.0 | 11.0 |
| Imports\(^a\) | kb/d | 351 | 386 | 398 | 381 | 10.1 | 2.9 | –4.1 |
| LPG production\(^ac\) | kb/d | 52 | 50 | 74 | 102 | –4.3 | 49.6 | 36.9 |

Refined products

- Refinery production\(^a\) | kb/d | 471 | 494 | 498 | 486 | 4.8 | 0.8 | –2.5 |
- Export volume\(^ad\) | kb/d | 18 | 18 | 17 | 18 | –3.5 | –1.1 | 1.0 |
- Import volume\(^a\) | kb/d | 616 | 644 | 647 | 662 | 4.5 | 0.5 | 2.4 |
- Consumption\(^d\) | kb/d | 1,005 | 1,041 | 1,072 | 1,092 | 3.5 | 3.1 | 1.8 |

Notes: a Number of days in a year is assumed to be exactly 365.25; b in 2018 calendar year dollars; c Primary products sold as LPG; d Domestic sales of marketable products; f forecast; g in 2018–19 financial year Australian dollars. A barrel of oil is equivalent to 158.987 litres. Source: ABS (2018), cat. No. 5464.0; International Energy Agency (2018); Department of Industry, Innovation and Science (2018)