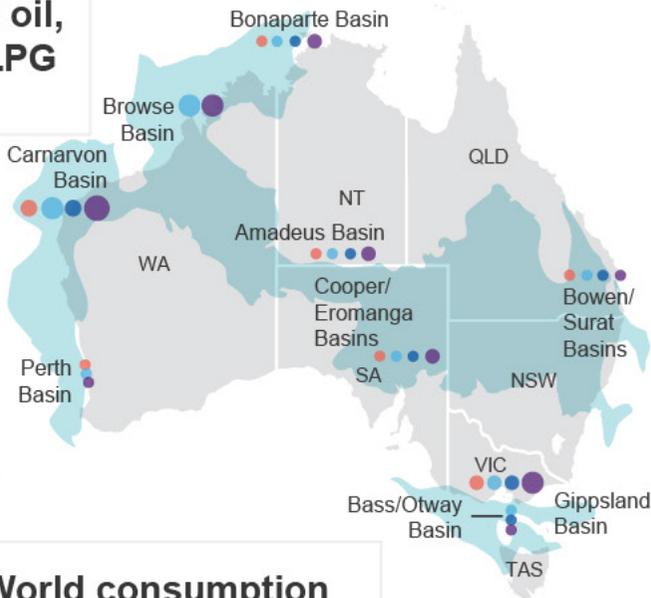
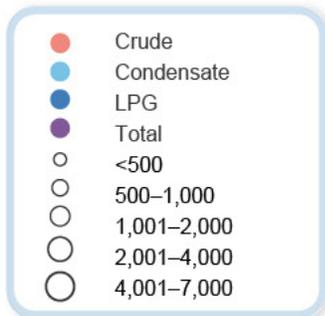


Oil

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



World consumption



Oil facts



Carnarvon basin produces around 2/3 of Australia's crude & condensate



In last 2 years Brent spot price has ranged from US\$17–US\$134 a barrel



In 2021, around 28% of refinery feedstock was domestically produced.

Australia's oil



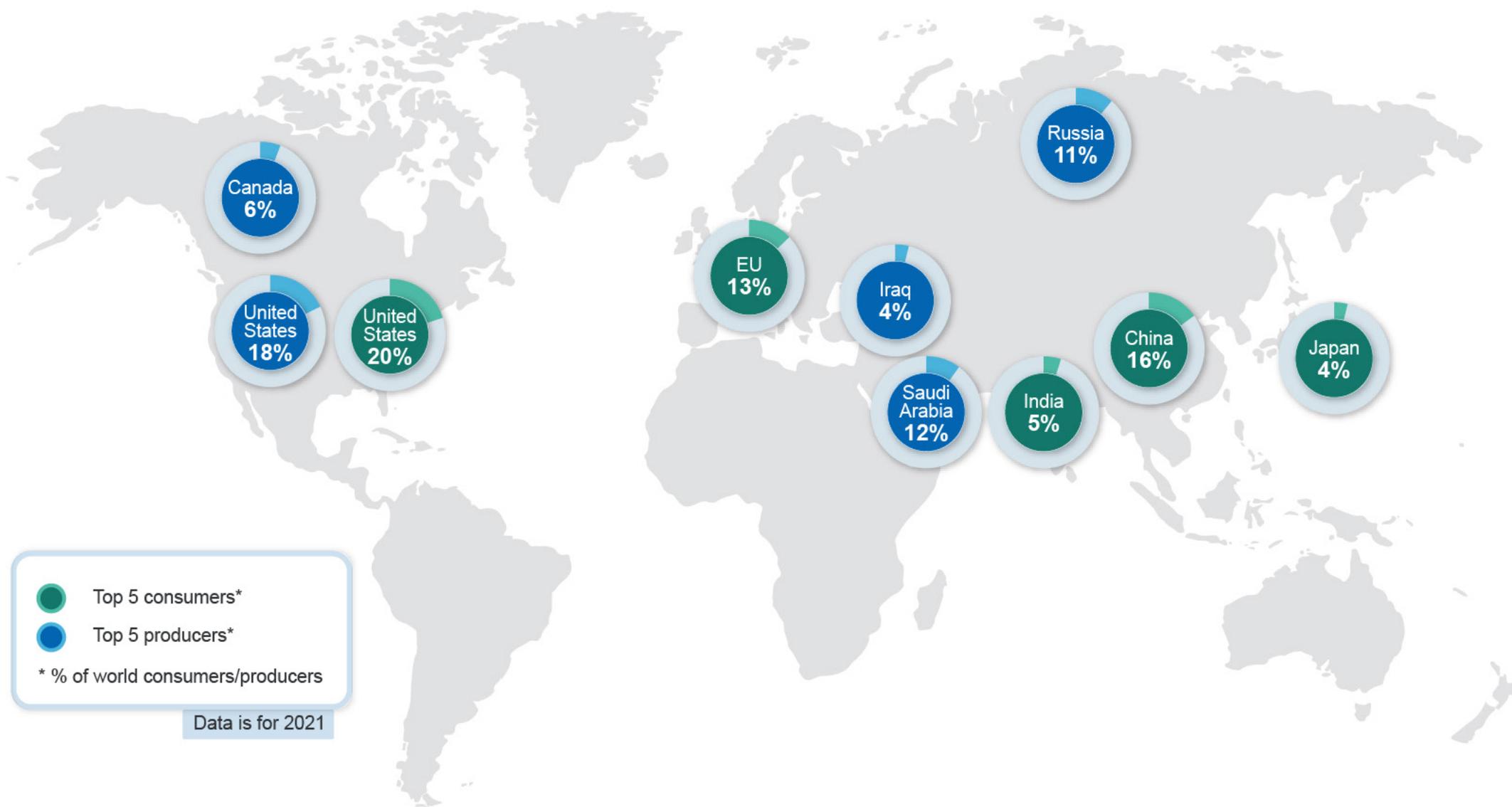
Holds 0.3% of the world's oil resources



In 2020-21 oil exports were worth \$7.4bn



Accounts for 0.5% of global production



8.1 Summary

- Significant uncertainty surrounds global oil price forecasts, with Russia's invasion of Ukraine driving global supply concerns in the midst of rising global demand. This chapter includes three price scenarios, with the base case scenario forecasting a Brent crude price averaging US\$108 a barrel in 2022, peaking in the middle of the year and then gradually declining.
- Australian crude oil and feedstock exports in 2021–22 are forecast to increase by 1.7% to 281,000 barrels a day. Exports are projected to lift later in the outlook period, as a number of new oil projects come online.
- Soaring oil prices are expected to lift Australian oil export earnings by 86% to \$13.8 billion in 2021–22, with earnings then holding steady in 2022–23.

8.2 World consumption

Demand on the path to recovery, led by the petrochemical sector

Global oil consumption in 2021 averaged 98 million barrels a day — this is 6.1% higher than in 2020, but 2.9% lower than in 2019. Consumption has been significantly impacted by the COVID-19 pandemic, with lockdowns and mobility restrictions affecting global industrial activity, commuting and leisure travel for significant periods. As vaccination programs rolled out in 2021 and global economic growth rebounded, oil consumption began to recover. This recovery is set to continue in 2022, with consumption forecast to rise by 2.2% to reach 100 million barrels a day. Demand gains appear to have been dampened in the March quarter by the impacts of Omicron variant outbreak. However, containment measures have been relatively modest compared to those employed during previous waves of COVID-19, potentially curbing the impact on economic activity.

Due to the rate of the transmission of the virus, and a continued rollout of vaccines and subsequent boosters, it is possible that immunity rates could result in minimal COVID-19 mobility restrictions in the second half of the year. However, new COVID-19 variants and subsequent waves will remain

a key threat to demand forecasts — particularly for countries such as China, which retain zero-COVID policies.

Demand for transportation fuels continues to recover, with solid growth predicted for 2022 and early 2023. Demand for gasoline and diesel for transportation are forecast to reach pre-pandemic levels this year. While traffic volumes in key markets dropped at the end of 2021 as Omicron cases surged, a rebound in transport use was observed by the beginning of February, as many European Governments ended 'work from home' advice and relaxed other restrictions. At the start of March, road traffic in European cities measured 95% of pre-pandemic levels. It is anticipated that there will be strong growth in road fuel consumption over the second and third quarters, with the return in commuter travel and the Northern Hemisphere summer travel season.

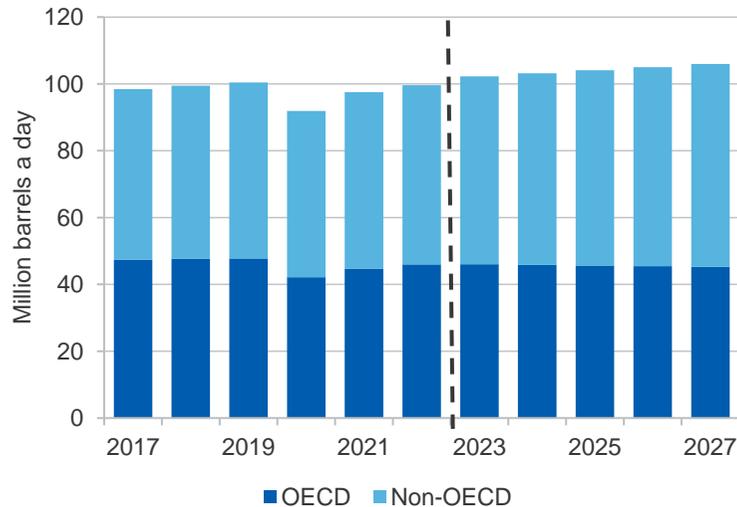
As global airline travel continues to recover, jet fuel consumption is predicted to rise in 2022 and into 2023 — but not to pre-pandemic levels. According to the International Air Transport Association, international passenger demand in 2021 was 76% below 2019 levels, and domestic demand was 28% below 2019 levels. Jet fuel consumption is expected to be led by private travel, with business travel lagging it. At the beginning of March 2022, flight departures in the Eurocontrol area were roughly 74% of the equivalent period in 2019, while passenger numbers in the US measured 88% of 2019 levels. Consumption is expected to return to pre-pandemic levels midway through the outlook period.

In 2021, industrial consumption rebounded strongly, with economic recovery aiding global petrochemical manufacturing. Global consumption of LPG/ethane and naphtha in 2021 were higher than 2019 levels. Demand for petrochemicals is again set to be a key driver of consumption growth in 2022. A surge in natural gas prices (see *gas* chapter) in Europe and Asia in the second half of last year triggered a growing interest in switching from gas to oil for power generation and industrial activities. It is estimated that higher natural gas prices increased demand for oil in Europe by between 250 kb/d and 300 kb/d, compared to typical seasonal

patterns. This trend is likely to support consumption in the March quarter 2022.

While global consumption is forecast to grow this year, Russia's invasion of Ukraine in February 2022 has provided an additional element of uncertainty to near term forecasts. The outlook for consumption in Russia and surrounding nations is now uncertain, as is the overall impact on global economic activity and travel. In 2023, total world oil consumption is forecast to rise by 2.7% to 102 million barrels a day, driven by global aviation demand (Figure 8.1).

Figure 8.1: Oil consumption, OECD and non-OECD



Source: Department of Industry, Science, Energy and Resources (2022); International Energy Agency (2022).

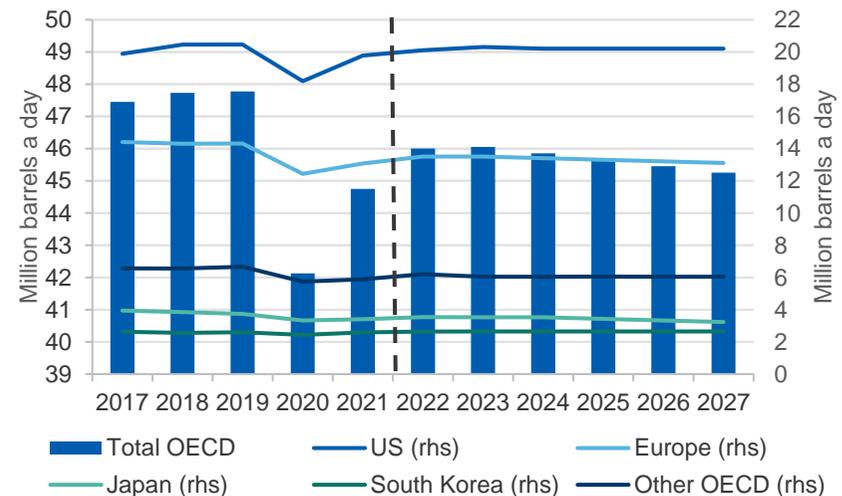
Consumption is projected to reach 104 million barrels a day by 2025, before increasing marginally by 2027. Escalating climate pressures are leading to an acceleration in renewable energy investment and a global shift away from fossil fuels and oil intensive consumption. The global energy transition away from oil intensive activities underpins the slowdown in consumption growth late in the projection period.

Transportation and industrial fuel demand supporting OECD consumption

OECD oil consumption rose by 6.2% in 2021. However, the pandemic caused significant variation across months and regions. Demand is forecast to be 46 million barrels a day in 2022 — a rise of 2.8%. Demand is forecast to decline later in the outlook period, reflecting a drop in transport demand, due to the global energy transition and specifically a higher uptake of electric vehicles (see the *lithium* chapter and Figure 8.2).

In 2021, consumption in the US and OECD Europe rose by 8.8% and 5.2% respectively, largely led by demand for petrochemical manufacturing. Higher natural gas prices have encouraged fuel switching and supported diesel demand in the industrial sector of OECD Europe. Both regions also saw gains in road transportation fuels, largely between May to August, which is the summer vacation travel season. High vaccination rates in these regions mean that widespread lockdowns are unlikely to reappear this year. This, combined with continued growth in economic activity, should support overall consumption growth in both regions in 2022, with industrial and transportation sectors again the key drivers.

Figure 8.1: OECD total consumption, by major nations



Source: Department of Industry, Science, Energy and Resources (2022); International Energy Agency (2022).

In 2022, US consumption is forecast to rise by 1.7% to 20 million barrels a day, led by continued improvement in mobility and accelerated manufacturing activity. Consumption in OECD Europe is forecast to rise 3.3% to 14 million barrels a day, driven by the expected pick up in air traffic.

In 2021, demand in the OECD Asia Pacific region rose by 3.8%, but was hindered by various COVID-19 restrictions and lockdowns. High vaccination rates in major nations — Japan, South Korea and Australia should support continued recovery in transportation, particularly in the aviation sector. Beyond 2022, consumption in the OECD Asia Pacific region is expected to return to around 2019 levels, albeit with declines later in the projection period.

Non-OECD consumption to lead global demand growth in 2022 and 2023

Non-OECD consumption has recovered to match pre-pandemic (2019) levels, averaging 53 million barrels a day in 2021. Consumption is forecast to rise to 54 million barrels a day in 2022.

Steady growth in petrochemical feedstock demand, including naphtha and LPG, as well as rebounding mobility, saw Chinese oil consumption grow by 8.6% in 2021. Petrochemical feedstock, gasoline and diesel demand are expected to drive growth again this year. With the emergence of the Omicron variant, at the end of 2021 and into early 2022, strict Government measures were introduced in select Chinese cities in line with the nation's zero-COVID policy. In mid-March, the nation was recording some of the largest daily case numbers since the start of the pandemic. In 2022, Chinese oil consumption is expected to reach 16 million barrels a day, however the evolving COVID outbreaks remain a key risk to consumption forecasts.

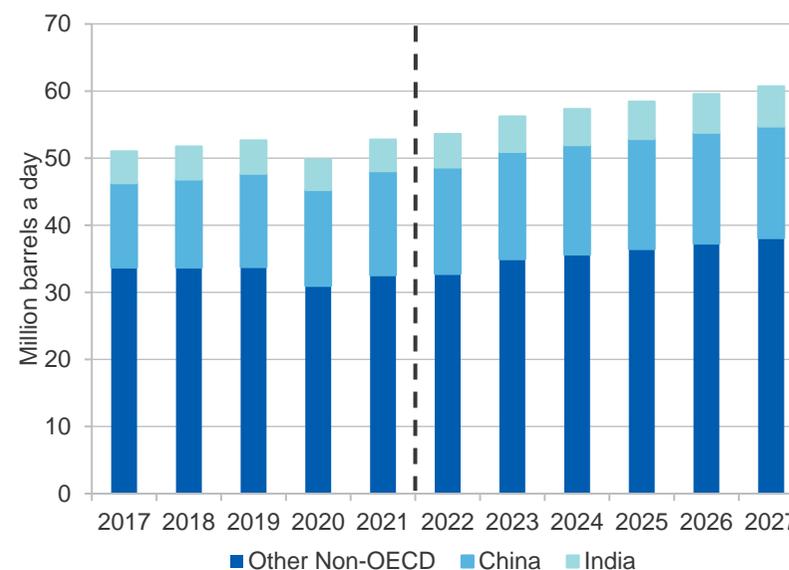
Despite weak outcomes in the middle of the year due to the Delta variant outbreak, and some extreme rainfall in November, India's oil demand recovered considerably in 2021 to almost match pre-pandemic levels. In 2022, Indian oil consumption is forecast to reach pre-pandemic levels, averaging 5 million barrels a day. This is expected to be driven by the

positive economic outlook and continuing demand by the manufacturing sector.

Since economic growth in non-OECD nations tends to be more oil-intensive than in OECD nations, it is expected that non-OECD nations will drive global oil consumption growth in the short term. However, new virus variants pose a downside risk to growth in these regions: low vaccine coverage could see COVID containment measures implemented.

Non-OECD consumption is projected to continue rising over the outlook period, reaching 56 million barrels a day in 2023, 58 million barrels a day in 2025 and 61 million barrels a day in 2027. China and India will continue to lead consumption growth for non-OECD nations (Figure 8.3).

Figure 8.3: Non-OECD consumption



Source: Department of Industry, Science, Energy and Resources (2022); International Energy Agency (2022)

8.3 World production

Production set to rise, but investment in sector is the key to future growth

While global oil output rose by 1.6% from 2020 levels to average 95 million barrels a day in 2021, inventories remained tight. The supply approach of OPEC+, combined with underperformance from some member nations, and a lagged recovery by some non-OPEC producers, led to falling global inventories, with OECD inventories reaching their lowest levels for seven years.

Global oil production is predicted to rise further in 2022, but the Russian invasion of Ukraine has added to global uncertainty. OPEC+ is expected to continue with monthly increases, but the failure of some member nations to meet targets could dampen growth. Russian production is also now expected to see growth declines – affected by both the active conflict and by sanctions imposed by some importers on Russian oil exports. In light of current prices and the tight global supply situation, some non-OPEC producers, including the US, Canada and Brazil could pump at their highest ever annual levels this year. Global production is forecast to increase by 4.3% to average 99 million barrels a day in 2022.

Production is projected to increase gradually over the rest of the outlook period, as OPEC+ output targets increase and production in non-OPEC+ members recovers. Output is projected to increase to 102 million barrels a day in 2023, and 105 million barrels a day by 2027. However, future production hinges on investment in the sector, which is of particular concern for higher-cost producer nations such as Canada and the US. Investment, combined with the structural adjustment from the transition away from fossil fuels, may weigh on world production later in the projection period.

OPEC+ supply progressively rising, but underperforming stated targets

In July 2021, members of the OPEC+ alliance reached an agreement for a significant winding back of production cuts which occurred from early 2020, when global oil inventories surged and prices plummeted. The group agreed to increase production every month — commencing in August

2021 — by an additional 400,000 barrels a day, with the agreement due to remain in place until September 2022. The group agreed to meet monthly to reaffirm members' commitments to ensure adequate supply and maintain market stability. For the remainder of 2021, the group stayed cautious and did not adopt any changes to the agreement, citing the continued risks of the COVID-19 pandemic to global oil demand. However, the group underperformed on their announced agreements between September and December. The supply shortfall, attributed to technical issues in upstream sectors, is estimated to have resulted in a loss to the global market of around 800,000 barrels a day since the start of 2021. Overall in 2021, OPEC+ output rose by 2.3% from 2020 levels, to average 49 million barrels a day.

OPEC+ has maintained their agreement so far in 2022, but the group still appears to be underperforming on production targets. Data for February 2022 shows that OPEC+ members involved in the supply deal pumped an additional 120,000 barrels a day, far less than the mooted 400,000 barrel a day increase. OPEC+ confirmed that it will proceed with monthly increases through April, and met on 31 March (after we went to print) to make a decision on May's output. Results of these production decisions continue to be a key source of uncertainty around global supply.

Russia is the world's third-largest producer of liquid fuels (after the United States and Saudi Arabia). In 2021, Russian crude oil production averaged 10 million barrels a day, up 2.1% from 2020. Russia's invasion of Ukraine has created considerable uncertainty regarding Russian oil production, and appetite for Russian product on the global market. While the nation's production and export capacity will likely remain largely available, there is significant uncertainty around how many countries will continue to import Russian oil. The impact of Russia's invasion of Ukraine on global oil markets continues to evolve, and additional commentary has been included in Box 8.1.

The potential full re-entry of Iran — which is currently exempt from output cuts — into the global oil market, would have a significant impact on world production. In February 2022, international negotiations to revive the Joint

Comprehensive Agreement Plan of Action resumed. Talks were still progressing at the time of writing. At the time the deal was made in 2015, Iran's crude output rose by 1 million barrels a day over a 9 month period. Early estimates suggest an easing of sanctions could see the addition of up to 1.3 million barrels a day into global markets from 2022.

Production in Libya averaged 1.2 million barrels day in 2021. In December 2021, armed militants shut off an estimated 370,000 barrels a day from the four key oil fields. While Libyan production is expected to remain stable in 2022 and 2023, the delayed presidential and parliamentary elections, originally scheduled for late December 2021, remain a source of key uncertainty. In addition, ongoing maintenance on the nation's ageing oil and gas infrastructure will continue to affect production.

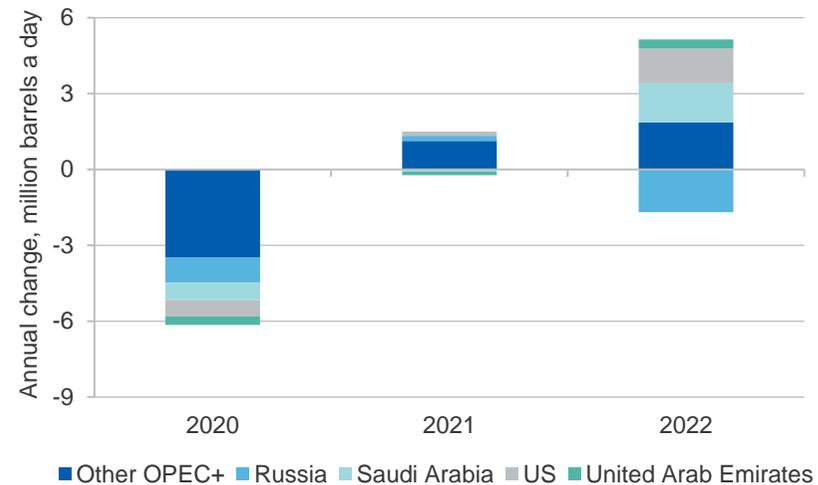
In 2022, OPEC+ production is expected to rise 4.2% to 51 million barrels a day. Forecasts assume OPEC+ will continue increasing quotas by 400,000 barrels a day each month until September 2022, and that Libya, Venezuela and Iran remain exempt from quotas. However the continuing underperformance of member nations outside the Middle East, will remain a risk to production targets. Additional uncertainty also exists over whether and how the group chooses to respond to future developments resulting from Russia's invasion of Ukraine.

Non-OPEC+ output saw modest growth in 2021, but expect faster in 2022

Non-OPEC+ output rose by 0.40 million barrels a day, or 0.9%, in 2021. Heavy maintenance programs (to catch up on works delayed in 2020), extreme weather, and lengthy outages due to COVID-19, constrained the 2021 output recovery.

US output recovered modestly from the steep falls of 2020, rising by 1.0% in 2021. Recovery efforts were hindered by a number of extreme weather events and COVID-19 disruptions. Severe winter conditions affected output in Texas in February, and Hurricane Ida passed through the Gulf of Mexico (GoM) in late August. In the December quarter 2021 production surged to the highest level since the March quarter of 2020, driven by the return in the GoM from Hurricane Ida and on the back of high prices.

Figure 8.4: Change in oil production by major producers



Source: Department of Industry, Science, Energy and Resources (2022); International Energy Agency (2022).

US production is forecast to rise 8.2% to 18 million barrels a day in 2022 — potentially the highest annual average US production on record. Given current price levels, and the recently imposed sanctions on US imports of Russian crude, there is heightened pressure on US producers to ramp up output. US output is projected to rise further over the outlook. Future growth looks to be driven by an acceleration in shale/tight crude production, but will be partially offset by the natural decline in onshore conventional fields. Investment levels in the US shale sector remain a key risk to production: a shift toward tighter Environmental, Social and Governance (ESG) measures as part of the Biden Administration's climate plans, could present some downside risks to future output over the projection period and beyond.

Other drivers of non-OPEC supply growth in 2022 are anticipated to be Brazil, Canada and Norway. In 2022, non-OPEC+ production is expected to surpass pre-COVID-19 levels, averaging 48 million barrels a day.

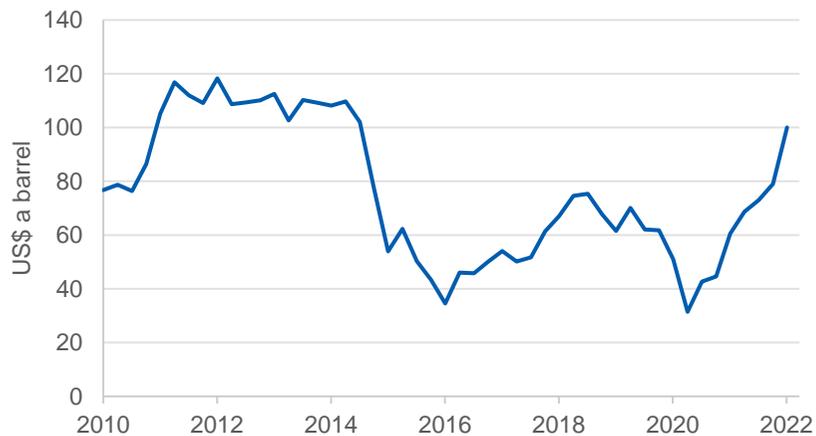
8.4 Prices

Prices rose to average \$US70 a barrel in 2021, with continuing increases

In 2021, oil prices followed a sharp upwards trajectory, following the dramatic falls in the first half of 2020. An uptick in global demand amid recovering economic activity, a disciplined approach from OPEC+, and a lagged recovery from other major producers, facilitated stock drawdowns and boosted prices. A steep surge occurred in the second half of the year, but was dampened with the news of the Omicron variant global outbreak. However, markets regained confidence by the end of December, when the Omicron variant appeared less ‘aggressive’ than first expected, recovering to \$US77 a barrel by 31 December 2021. The average Brent price for 2021 was \$US70 a barrel — up 67% from the 2020 average.

A tight market supported the rally into early 2022 — with prices in January rising 15% m-o-m, to average US\$86 a barrel. Despite soaring levels of COVID-19 Omicron cases in early 2022, global consumption has remained robust. The stronger-than-expected demand has come amid tightening global supplies and already low inventories, with OPEC+ struggling to increase output in line with the agreed quotas.

Figure 8.5: Brent oil prices, 2010 to 2022



Source: Bloomberg (2022); Department of Industry, Science, Energy and Resources (2022).

Prices grew by 12% m-o-m to average \$US96 a barrel in February, as concerns around a Russian invasion of Ukraine increased. Following Russia’s invasion, the risk of sustained energy supply shocks, and the imposition of sanctions from various nations, saw prices spike well over the \$US100 a barrel in March — the highest levels since July 2008. Prices remained extremely volatile in March as the situation evolved, with prices declining in mid-March as Russia–Ukraine negotiations progressed. The overall price rise over the last year has been dramatic — with the March quarter 2022 average (estimated) up 65% y-o-y.

Brent prices to remain elevated in near term, but eventually decline

The rapidly evolving conditions surrounding Russia’s invasion of Ukraine have led to unusually high levels of uncertainty in global oil markets. To assist in assessing these uncertainties, a pricing scenario analysis has been included in Box 8.1. The analysis explores the effects of potential developments which may result from the conflict, on oil prices, and on how this will impact Australian exports. The forecast scenario discussed in this section is the ‘baseline’ case, but the scenario analysis also considers more and less severe scenarios.

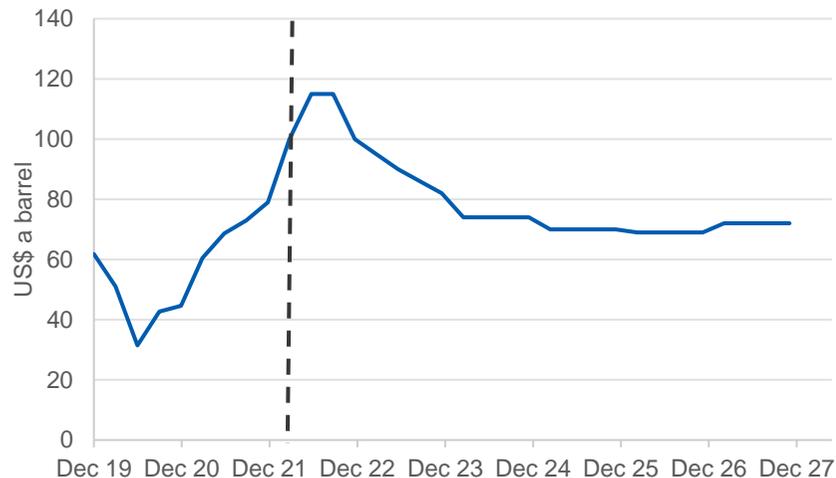
Prices are expected to remain elevated in 2022 and 2023, as consumption continues to rise against a backdrop of volatile supply and low global inventories. The rapidly changing conditions in Ukraine, and the evolving Western response, is triggering immense volatility in global prices, and creating a more difficult forecasting environment. It is anticipated that 2022 quarterly average prices will peak in the June and September quarters, averaging \$US115 a barrel, before beginning a gradual decline. It is anticipated that the scheduled increases in the OPEC+ output, alongside rising output from other producers, should help to put some downward pressure on prices later in the year. By the December quarter 2022, Brent prices are forecast to average \$US100 a barrel.

The supply side is expected to dominate risks to prices in the near term. In addition to Russia’s invasion of Ukraine, (see Box 8.1 for a detailed discussion) uncertainty also exists over whether the joint Comprehensive Agreement Plan is revived, and if it is, the speed at which sanctions are

lifted and Iranian crude can thus enter the global market. During the March quarter 2022, prices fluctuated noticeably as the negotiations waxed and waned. The decisions and actions of OPEC+ also add to supply uncertainty. While it's anticipated the group will continue with their monthly production increases, they are currently failing to meet announced production targets. There is also uncertainty around whether the group revises their agreement in light of Russia's invasion of Ukraine. While US production is set to increase this year, uncertainty exists about the rate by which producers will ramp up drilling.

These risks to supply will exist amid the uncertain trajectory of the COVID-19 pandemic, where future virus variants will continue to dominate the demand risk landscape. While it is anticipated that global consumption will continue on an upward trajectory throughout 2022, the effectiveness of vaccines against new virus strains, and the response from authorities when new outbreaks occur — particularly for nations who have adopted zero-COVID policies — has strong potential to impact global demand and impact market confidence.

Figure 8.6: Brent oil price outlook



Source: Bloomberg (2022); Department of Industry, Science, Energy and Resources

Under the baseline scenario, in 2023, the Brent price is forecast to average \$US88 a barrel. Beyond 2023, it is anticipated prices will continue to decline gradually, as global inventories are restored amidst moderate consumption growth and a shift among major countries towards less oil-intensive transportation.

Any oil market reorganisation due to the conflict in Ukraine is likely to be well established by the mid/late outlook period. Prices are projected to average US\$74 a barrel in 2024, falling to US\$69 a barrel in 2026 and stabilising at \$US72 a barrel in 2027 (in 2022 dollars) (Figure 8.6).

8.5 Australia

Future production influenced by potential new projects and natural decline

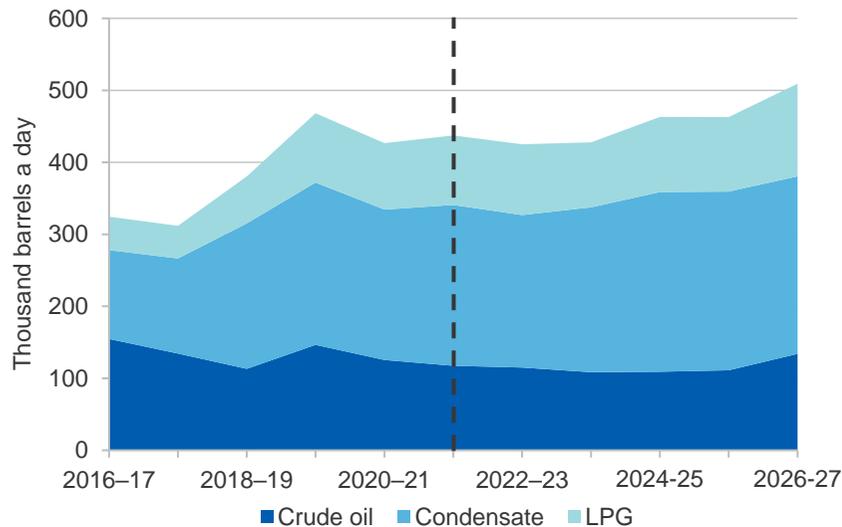
In 2020–21, condensate accounted for 49% of total Australian crude oil, condensate and LPG production. Crude oil accounted for 29% (Figure 8.7). In 2021–22, Australian crude and condensate production is forecast to increase by 0.8% to 337,000 barrels a day. Crude production figures will be boosted by the successful tie-in and start-up activities for the two remaining wells in Santos' Van Gogh Phase 2 infill program (at the end of 2021), and an increase in production at the Vincent field. Condensate production is expected to lift in 2021–22, in tandem with the record LNG production (see Gas chapter) in the last half of 2021, since the majority of Australian condensate is a by-product of gas. Condensate production was impacted throughout 2020–21 by technical issues that caused prolonged shut-downs at Gorgon and the Prelude FLNG project. However, a fire and subsequent power failures in December 2021, have seen production again suspended at Prelude. In mid-March 2022, Prelude received approval from NOPSEMA to restart operations, however restart timeframes were unclear at the time of writing.

Several potential and progressing Australian oil and gas projects will affect crude, condensate and LPG production later in the projection period (see *Resources and Energy Major Projects: 2021 Report*). Santos is anticipating a Final Investment Decision (FID) on the Dorado oil project in the Bedout sub-basin off the Western Australia coast in the middle of this year. This project has an estimated initial capacity of 75-100k barrels a

day — nearly a quarter of 2020–21 Australian crude oil and condensate production. According to Santos, the development is progressing, with the front-end engineering and design (FEED) phase commencing for the FPSO and Wellhead Platform. First output is expected by 2026. First oil output at the Pyrenees Infill Phase 4 Project could be possible by 2023, with an estimated peak production rate of 13,500 barrels a day. In 2021, Santos announced a FID to proceed with their Barossa backfill to Darwin LNG gas and condensate project. First production is targeted for 2025.

In 2022–23, Australian crude and condensate production is forecast at 327,000 barrels a day. While upcoming projects like Dorado will work to boost crude production later in the projection period, this will be met with the natural decline at existing fields and projects. Output is projected to increase to 381,000 barrels a day by 2026–27.

Figure 8.7: Composition of Australian oil production



Source: Australian Petroleum Statistics (2022); Department of Industry, Science, Energy and Resources (2022)

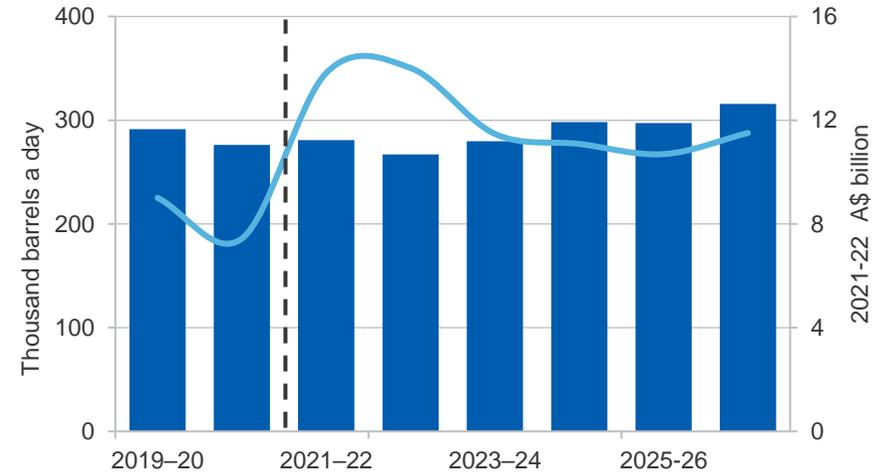
Australian export earnings to lift with high prices and solid production

In 2021–22, Australian crude and condensate export values are forecast to increase by 86% to \$13.8 billion, driven by high oil prices, as well as stronger production volumes, particularly for condensate. Exports are forecast to rise slightly in 2022–23, due to the higher oil prices forecast for 2022 and 2023. Between 2023–24 and 2026–27, export values are projected to remain around \$11 billion, as prices gradually decline (in 2021–22 dollars) (Figure 8.8).

Domestic refinery production falling with refinery closures

After a challenging 2020 — with low transport fuel demand combined with commercial and international factors — half of Australia’s refineries began converting to import terminals in the 2020-21 financial year. The closure of the Kwinana (WA) and Altona (VIC) refineries will contribute to a fall in refinery output of petrol, diesel and jet fuel for 2021–22. Output for 2021–22 is expected to decline by 33% from 2020–21 levels.

Figure 8.8: Australian oil and feedstock exports



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

Source: Australian Bureau of Statistics (2022); Department of Industry, Science, Energy and Resources (2022).

The two remaining refineries — Ampol’s refinery in Lytton (Queensland) and Viva Energy’s refinery in Geelong (Victoria) — have committed to continue to operate until at least mid-2027, with the offer of Government support. As part of the 2021–22 Budget, the Australian Government announced a new fuel security package. The package includes a variable fuel security services payment to the two refineries, which provides payment for the production of key transport fuels (jet fuel, petrol and diesel). The refiners will also receive up to \$302 million each to conduct major infrastructure upgrades to produce and supply better quality fuels. A minimum stockholding obligation (MSO) is also included in the package, requiring importers and refiners in Australia to maintain minimum stocks of key transport fuels.

Consumption figures for the financial year will be constrained by south east coast state lockdowns, which occurred in the second half of 2021. However, consumption will be aided by stronger demand for transport fuels in the first half of 2022, when restrictions were lifted and state borders reopened. The rebound in transport fuel demand was already evident at the end of last year; in December 2021, sales of jet fuel rose 22%, and petrol sales rose 6%, compared with November 2021 levels. Throughout the COVID-19 pandemic, demand for diesel has remained strong. Consumption for 2020–21 was 2% higher than in 2019–20, owing to its broad consumption base. Demand for diesel is anticipated to grow further in 2021–22.

Refined product imports for 2021–22 are expected to increase by 20%, driven by the reduced refinery capacity. Meanwhile, imports of crude oil and other refinery feedstocks are expected to decrease 27%, reflecting the closure of the Kwinana and Altona refineries. Imports of diesel and petrol reached record levels in November and December 2021.

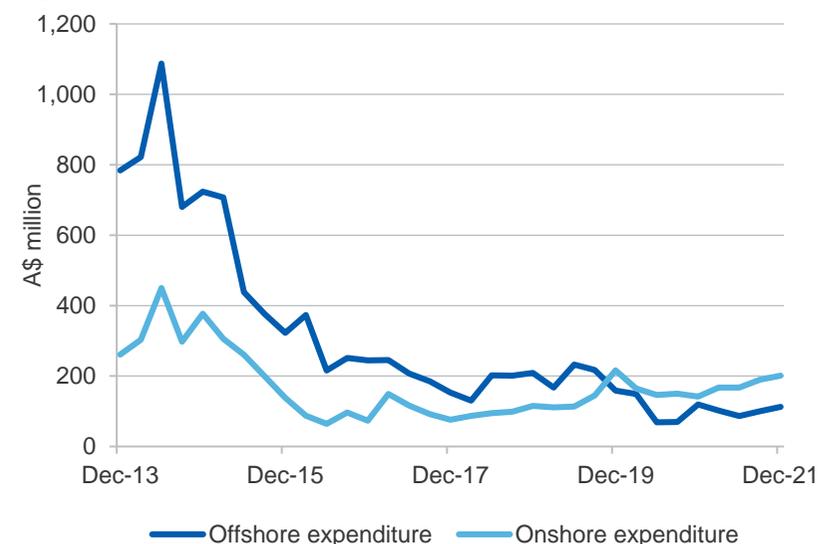
Consumption for 2022–23 is expected to recover to pre-pandemic (2018–19) levels, driven by growing demand for aviation fuels — with the reopening of Australia’s international border. In 2018–19, aviation consumption accounted for a relatively high share of product usage — around 16%. For the remainder of the outlook period, Australian oil

consumption is projected to increase marginally, reaching one million barrels a day by 2026–27. Reduced Australian refining capacity will likely see imports of refined products increase significantly over the outlook.

Exploration

In the December quarter 2021, Australia’s petroleum exploration expenditure was \$314 million on a seasonally-adjusted basis — a quarterly increase of \$24.2 million or 8.3%. This is 20% higher year-on-year. Onshore exploration rose 6% to \$201 million, while offshore increased by 13% to \$113 million (Figure 8.9).

Figure 8.9: Australian petroleum exploration



Source: Australian Bureau of Statistics (2022) Mineral and Petroleum Exploration, 8412.0.

Revisions to forecasts

Since the December 2021 REQ, the forecast for Australia’s crude and condensate export earnings has been revised up by around \$1.2 billion in 2021–22 and \$2.7 billion in 2022–23, due to significantly higher oil price forecasts. Compared to \$11.4 billion in the March 2021 REQ, export earnings in 2025–26 are now forecast at \$10.7 billion.

Box 8.1: Impact of Russia's invasion of Ukraine on global oil and gas markets – scenario analysis

Oil and gas prices have been highly volatile since early January 2022, when speculation of a Russian invasion of Ukraine began to affect energy markets. Prices rose after the invasion began, with oil prices reaching US\$134 at the beginning of March. North East Asian LNG spot prices have risen to over US\$54 a mmBtu.

Russia is the second largest supplier of gas and the third largest supplier of oil into global markets. There is a particularly heavy reliance on Russian energy products in Europe, where Russia accounted for 40% of gas imports and 25-30% of oil imports in 2021.

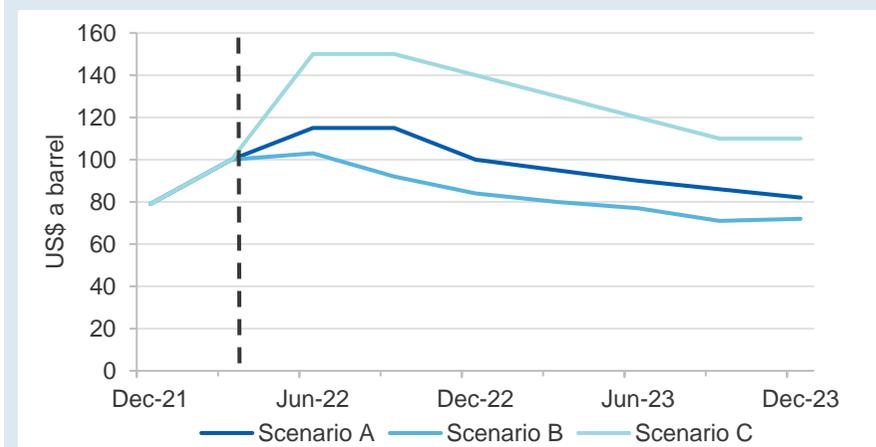
Russian energy exports are now facing sanctions from various countries, including the US, UK and Australia, though significant gas importers in Europe have not yet committed to stopping their purchases. Other countries and companies are turning away from Russian supply in less formal ways. These impacts on Russian supply will have significant and highly variable impacts on the prices of key energy commodities such as oil and gas/LNG.

The situation in Ukraine and the global response continues to change rapidly. As a result, price forecasts for oil and LNG face significant uncertainty, which leads to uncertainty around Australia's export revenue. The forecast oil price affects Australia's LNG export earnings, since almost three quarters of Australian LNG is sold under long-term oil-price linked contracts.

Three pricing scenarios have been developed to provide a sense of the possible outcomes. These are a 'baseline', a 'lower impact' case (under which prices correct more rapidly), and a 'severe impact' case (under which high prices persist for longer). The scenarios cover 2022 and 2023.

The baseline scenario for oil and LNG underpins the analysis in the oil and LNG chapters for this edition.

Figure 8.10: Oil price scenarios



Source: Bloomberg (2022); Department of Industry, Science, Energy and Resources (2022).

Scenario A: Baseline

Under this scenario, OPEC+ are assumed not to make any changes to their monthly scheduled increase in oil production. The revival of the Joint Comprehensive Agreement Plan of Action between the US and Iran is delayed, and full Iranian oil exports therefore do not re-enter the global market before the end of 2023. Russian oil supply to Europe is assumed to continue over the outlook. Heightened price volatility persists, due to the increased risk premium associated with active conflict, even as Russia-Ukraine negotiations progress.

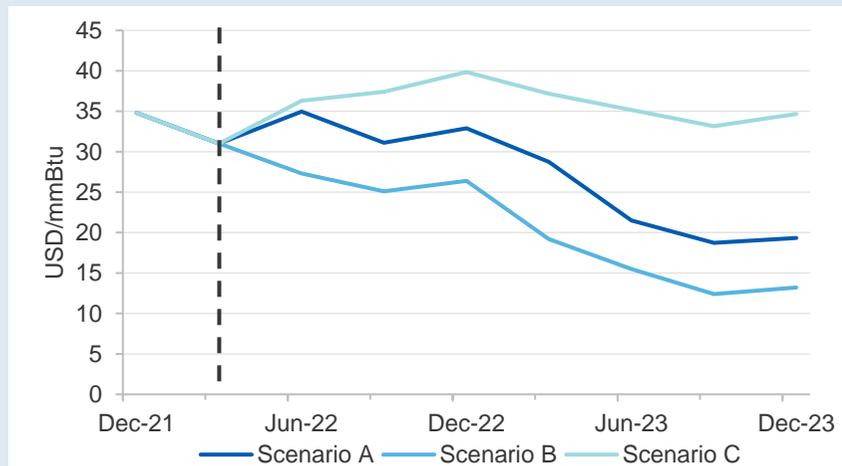
Under these conditions, it is expected that prices peak in the June and September quarters of 2022, averaging \$US115 a barrel, before declining gradually as markets re-organise. The scheduled increases from OPEC+, along with higher output from other producers, help to build global inventories and place downward pressure on prices. Prices start to ease from late 2022 and average \$US90 a barrel by the June quarter of 2023.

For LNG, the baseline case assumes no significant disruptions to Russian flows to Europe, and no sanctions against Russian LNG exports into Asia.

Prices are assumed to stay above long-run averages in 2022, as Europe seeks to rebuild depleted inventories and diversify its sources of gas supply — in line with IEA guidelines. Demand for LNG is expected to increase, with prices peaking in the June quarter 2022, at US\$35 a mmBtu, before slowly falling into 2023 as markets reorganise and additional US supply comes online.

The baseline scenario suggests that Australian oil export earnings (crude and condensate) will reach \$13.8 billion in 2021–22, and \$14.0 billion in 2022-23. Combining the oil price forecasts and the LNG spot price forecasts, Australia’s export earnings from LNG are forecast to be \$70.2 billion in 2021–22 and \$82.0 billion in 2022–23.

Figure 8.11: North East Asian LNG spot price scenarios



Source: Argus (2022); Bloomberg (2022); Department of Industry, Science, Energy and Resources (2022)

Scenario B: prices decline more quickly

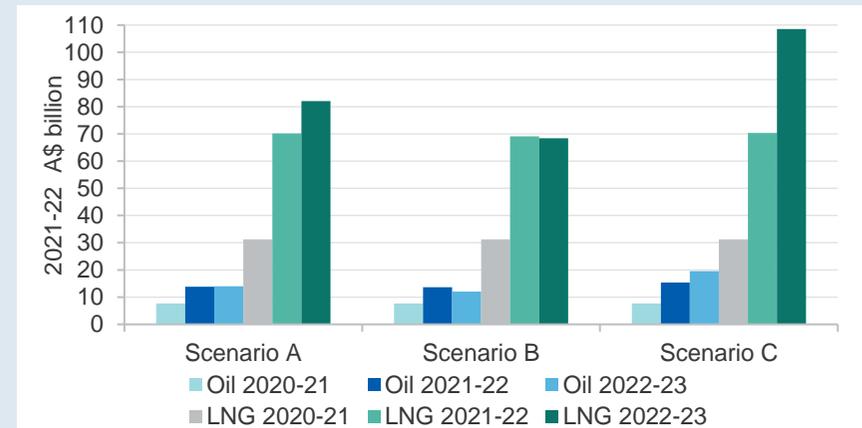
This scenario assumes that current volatility in pricing is short-lived, and that prices for both oil and LNG soon start to track towards their long-run averages. Oil prices are forecast to average \$US103 a barrel for the June quarter 2022, declining to \$US84 a barrel by the December quarter 2022.

OPEC+ is assumed to maintain scheduled monthly output increases, and no other major nations are assumed to impose sanctions on Russian oil imports. Full Iranian oil exports potentially enter the market within the next year. Market ‘reorganisation’ occurs rapidly. Under these conditions, prices could be expected to reach \$US77 a barrel by the June quarter 2023.

LNG prices remain elevated in the June quarter 2022, but decline sooner and more sharply than in the baseline scenario. Disruptions to LNG flows from Russia to European and other markets are minimal, and Europe’s demand for LNG (and gas more generally) declines. In this scenario, prices track towards their long-run averages by the end of 2023, reaching US\$13.2 a mmBtu in the December quarter.

Scenario B implies that Australia’s oil export earnings will be \$13.7 billion in 2021–22, and \$12.1 billion in 2022–23. Combining the oil price forecasts and LNG spot price forecasts, Australia’s LNG export earnings are forecast at \$69.1 billion in 2021–22 and \$68.4 billion in 2022–23.

Figure 8.12: Australian Oil and LNG export earnings by scenario



Notes: Includes crude oil and condensate, but excludes LPG.
Source: Australian Bureau of Statistics (2022); Department of Industry, Science, Energy and Resources (2022).

Scenario C: prices reach higher levels, and remain there for longer

Under this scenario, the fallout from the Russian invasion of Ukraine has a tangible impact on supply in both global oil and gas markets, with prices reaching record levels, and sustaining high levels for far longer than under the baseline scenario.

The ongoing conflict is assumed to cause severe damage to infrastructure and delays to seaborne freight, and European markets turn away from Russian crude. Under these conditions, prices are forecast to reach \$US150 a barrel in the June quarter, holding until early 2023 and then declining slowly to average \$US110 a barrel by December quarter 2023.

For LNG, prices continue to rise through 2022, peaking at US\$40 a mmBtu in the December quarter. It is assumed that both Asian and European markets turn away from Russian gas, with significant impacts given Russia's importance as a supplier to countries such as Japan. With limited ex-Russian supply available, prices peak late in 2022, rising even during the conventional "low demand" seasons, as consumers seek to refill storage. This impact is expected to soften in 2023, as markets re-organise. Prices nonetheless remain above US\$35 a mmBtu at the end of 2023, close to the level of the December quarter 2021.

Under the severe impact scenario, Australia's export earnings from oil are forecast to reach \$15.4 billion in 2021–22, and \$19.6 billion in 2022–23. Combining the oil price forecasts and the LNG spot price forecasts, Australia's export earnings from LNG are forecast to reach \$70.3 billion in 2021–22 and \$109 billion in 2022–23.

Table 8.1: Oil Outlook

World	Unit	2021	2022 ^f	2023 ^z	2024 ^z	2025 ^z	2026 ^z	2027 ^z	CAGR ^r
Production ^a	mb/d	95	99	102	103	104	105	105	1.7
Consumption ^a	mb/d	98	100	102	103	104	105	106	1.4
WTI crude oil price									
Nominal	US\$/bbl	68	99	84	70	65	63	65	-0.7
Real ^b	US\$/bbl	70	99	82	66	60	57	57	-3.2
Brent crude oil price									
Nominal	US\$/bbl	70	108	88	74	70	69	72	0.4
Real ^b	US\$/bbl	73	108	86	70	65	62	64	-2.2
Australia	Unit	2020–21	2021–22 ^f	2022–23 ^z	2023–24 ^z	2024–25 ^z	2025–26 ^z	2026–27 ^z	CAGR ^r
Crude and condensate									
Production ^{ac}	kb/d	335	337	327	338	359	359	381	2.2
Export volume ^a	kb/d	276	281	267	280	298	297	316	2.3
– Nominal value	A\$m	7,434	13,823	14,013	11,473	11,086	10,693	11,510	7.6
– Real value ^h	A\$m	7,685	13,823	13,589	10,837	10,212	9,610	10,092	4.6
Imports ^a	kb/d	247	181	185	183	178	174	168	-6.2
LPG production ^{acd}	kb/d	92	96	98	90	104	103	102	1.7
Refined products									
– Refinery production ^{ac}	kb/d	375	249	233	230	227	224	222	-8.4
– Export volume ^{ae}	kb/d	13	10	9	9	9	9	9	-6.2
– Import volume ^a	kb/d	647	773	843	862	894	907	911	5.9
– Consumption ^{ag}	kb/d	913	944	997	1,020	1,038	1,050	1,052	2.4

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 2022 calendar year US dollars; **c** Historical production data was revised in the December quarter 2021 to align with the Australian Petroleum Statistics **d** Primary products sold as LPG; **e** Excludes LPG; **f** Forecast; **g** Domestic sales of marketable products, including imports; **h** In 2021-22 financial year Australian dollars; **s** estimate.

Source: ABS (2022) International Trade in Goods and Services, Australia, Cat. No. 5368.0; International Energy Agency (2022); EnergyQuest (2022); US Energy Information Administration (2022); Department of Industry, Science, Energy and Resources (2022).