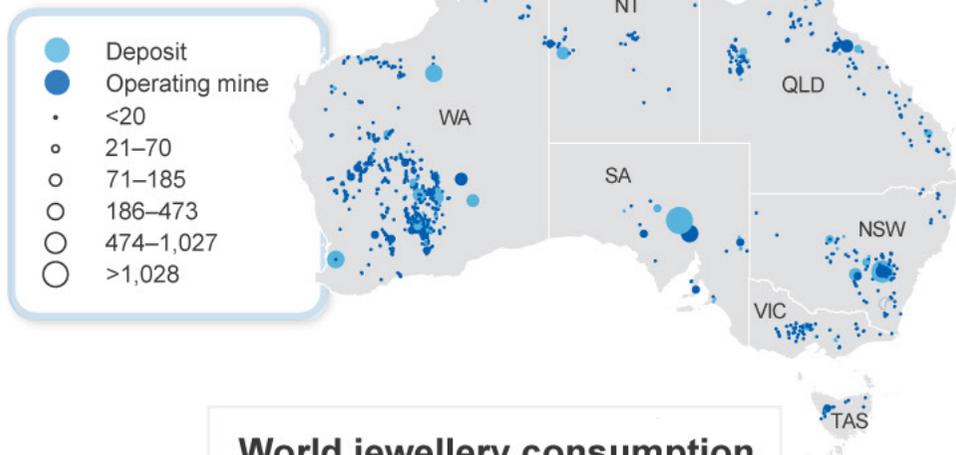
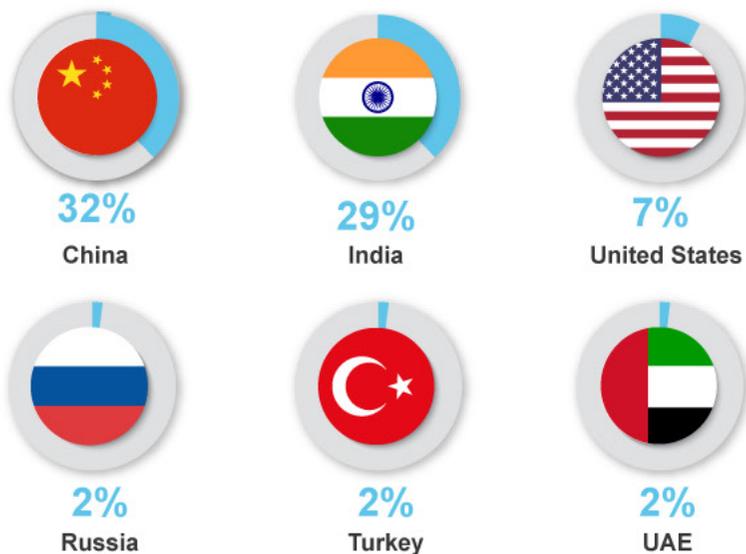


Major Australian gold deposits (tonnes)



World jewellery consumption



Gold



Gold is a critical component in COVID-19 diagnostic tests



The US holds the largest stockpile of gold reserves: **8,134 tonnes**



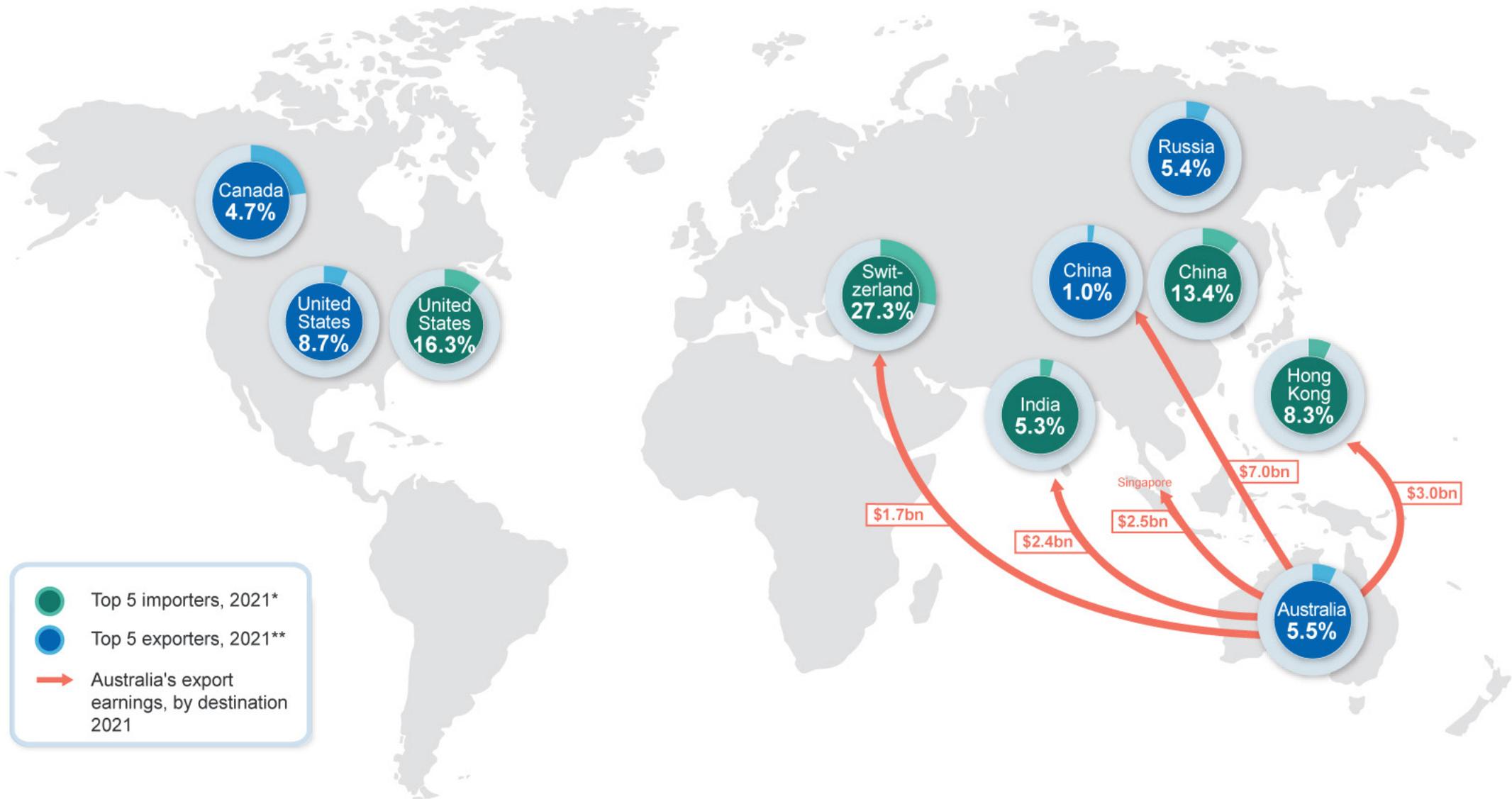
In 2021 jewellery fabrication made up **55% of global gold use**



Gold makes up **3 parts per billion** of the Earth's outer layer

Australia's gold





* % of world imports (including ETFs and other investments)

** % of gold export from top 5 gold producing countries

10.1 Summary

- The Russian invasion of Ukraine is likely to support gold demand and prices in the very short term. However, the gold price is forecast to slide from an average of US\$1,770 an ounce in 2022 to US\$1,380 an ounce in 2027 in real terms as real bond yields lift.
- Production from new mines and existing mine expansions is expected to boost gold mine production to 374 tonnes in 2026–27 (see [Australia section](#)).
- Lower gold prices are expected to push the value of Australia’s gold exports down to \$22 billion in 2026–27 in real terms.

10.2 Consumption

World gold consumption increased in 2021

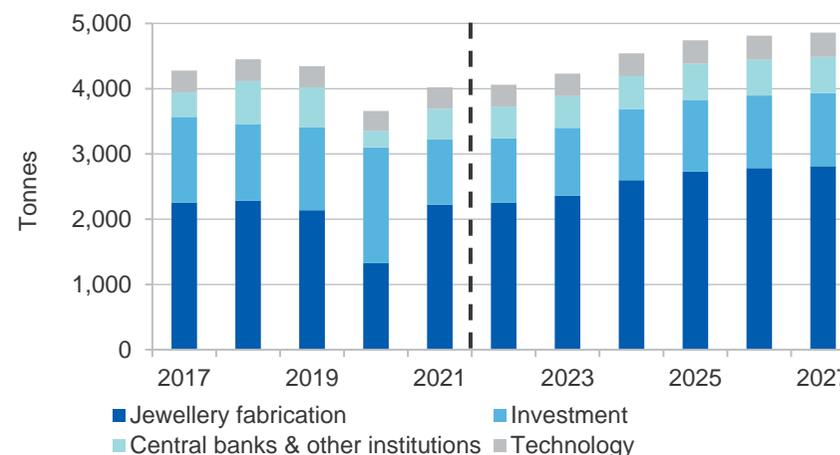
World gold consumption increased by 9.9% year-on-year to 4,021 tonnes in 2021 (Figure 10.1). The economic recovery from the pandemic provided support to gold jewellery demand in 2021, up 52% year-on-year, to 2,124 tonnes. China and India have led this recovery, as lower and more stable gold prices (compared with 2020) and rising personal income lifted gold demand.

In China, gold consumption grew by 57% year-on-year in 2021 to 960 tonnes. The growth included a 63% year-on-year rise in jewellery usage and a 44% year-on-year rise in gold bars and coins consumption.

In India, gold consumption increased by 79% year-on-year to 797 tonnes in 2021, propelled by a 93% year-on-year rise in jewellery consumption and a 43% year-on-year rise in gold bars and coins consumption. The rise in jewellery consumption was largely attributed to the postponement of weddings to 2021, following outbreaks of the COVID-19 pandemic in 2020.

In the US, gold consumption grew by 42% year-on-year to 266 tonnes in 2021, driven by the COVID-19 vaccine rollout, improved consumer sentiment and high household savings. In Europe, gold consumption rose by 8.9% year-on-year to 332 tonnes in 2021, supported by a 21% year-on-year rise in jewellery consumption.

Figure 10.1: World gold demand by sector



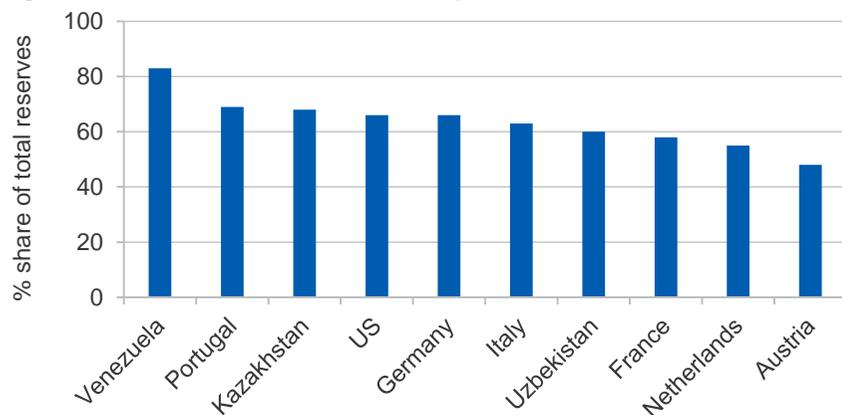
Notes: Jewellery fabrication includes jewellery consumption and jewellery inventory. Investment includes ETFs, bars and coins. Technology includes gold used in the electronic, dentistry and other industrial sectors.
Source: World Gold Council (2022); Metals Focus (2022); Department of Industry, Science, Energy and Resources (2022).

Net official sector (central banks and other government institutions) purchases increased by 82% year-on-year to 463 tonnes in 2021. A desire to diversify reserves, growing debt levels and rising inflation appear to have been the catalyst for central banks’ growing appetite towards gold. According to the World Gold Council, Thailand and India were the largest gold buyers in 2021, purchasing 165 tonnes of gold. The Philippines and Kyrgyz Republic were the largest gold sellers in 2021, selling a combined total of 38 tonnes of gold.

Figure 10.2 shows the share of gold in total reserves in some selected countries. Gold accounted for 83% of Venezuela’s country reserves, 69% in Portugal, 68% in Kazakhstan and 66% in the US.

Demand for gold in technology increased by 8.9% year-on-year to 330 tonnes in 2021, propelled by a 9.2% year-on-year rise in gold used in the electronics sector. The COVID-19 pandemic has increased demand for

Figure 10.2: Gold share of country reserves, 2021



Notes: Gold holdings as of June 2018 (Venezuela), November 2021 (Portugal, Germany, Italy, France, the Netherlands and Austria), and December 2021 (Kazakhstan, the US and Uzbekistan).

Source: World Gold Council (2022)

high-end LEDs which are used in skin sensors and heart rate-tracking functionality in smartphones and watches. Over this period, gold used in other industrial applications rose by 12% year-on-year to 47 tonnes. High gold prices affected demand for gold in the dental sector; usage was down by 4.2% year-on-year to 11.4 tonnes in 2021, as consumers substituted ceramics for gold.

Offsetting the rise in gold consumption in the jewellery, official and industrial sectors, gold-backed exchange traded funds (ETFs) had a net outflow of 173 tonnes of gold (equivalent to US\$9.0 billion) in 2021. An improving global economy and the COVID-19 vaccine roll-out led to an exodus of institutional investors' funds from safe haven assets (such as gold ETFs) to riskier assets. Global stock markets continued to reach record highs in 2021, attracting record investment fund flows.

World gold consumption to rise in 2022

World gold consumption is forecast to increase by 1.0% to 4,061 tonnes in 2022 (Figure 10.1), driven by increased jewellery consumption, which is forecast to rise by 6.0% in 2022.

Jewellery demand from China is expected to remain strong, supported by rising consumer confidence and income. Chinese jewellery retailers are increasingly using private and social media channels to attract young Chinese consumers.

Demand from India is expected to continue to recover in 2022, as more people are vaccinated against COVID-19 and the economy recovers.

In the US, jewellery demand is forecast to be lower than in 2021, with consumer discretionary spending expected to move towards leisure activities as COVID-19 restrictions ease and economic activity normalises.

The official sector is expected to add to gold demand in 2022, as geopolitical tensions (especially between Russia and Ukraine) persist. Central bank gold buying is forecast to rise by 5.0% to 486 tonnes in 2022.

In October 2021, the National Bank of Poland (Poland's central bank) release its plan to purchase 100 tonnes of gold in 2022. The central bank has said this planned addition aims to lift Poland's financial security, taking the nation's gold reserve to 330 tonnes. This would put Poland ahead of other major gold holders such as the UK, Saudi Arabia and Austria.

World gold demand projected to rise until 2025, then fall in 2026 and 2027

After 2022, world gold consumption is projected to rise at an annual average rate of 4.0%, reaching 4,925 tonnes by 2027, as lower gold prices boost jewellery demand and retail investment (Figure 10.1).

Over this period, global jewellery consumption is projected to grow at an annual rate of 4.6%. Consumption is projected to reach 2,812 tonnes by 2027, driven by an improvement in consumer sentiment, rising income and lower gold prices.

Demand from China is expected to pick up, as price-sensitive Chinese consumers react to price falls. Economic growth, ongoing urbanisation, and rising incomes are all expected to contribute to higher jewellery demand in India. In the US and Europe, an improvement in consumer confidence is also likely to support the demand for gold jewellery in those markets (Figure 10.1).

The forecast decline in gold prices will likely attract a return of retail investors to the gold bar and coin markets. Gold bar and coin demand by investors is projected to grow at an annual rate of 2.6% between 2023 and 2027, to reach 1,121 tonnes by 2027.

After reaching a ten-year low of 255 tonnes in 2020, the pace of central bank gold buying is projected to increase by an average 2.7% a year over the 2023 and 2027 period, reaching 554 tonnes in 2027. Central banks are expected to shift their focus from accommodative liquidity requirements — to support economic growth during the COVID-19 pandemic — to reserves diversification, in order to try to protect their wealth.

10.3 Production

World gold supply declined in 2021

World gold supply decreased by 1.2% year-on-year to 4,666 tonnes in 2021 (Figure 10.3). Driving the decline was an 11% year-on-year fall in gold scrap supply, to 1,150 tonnes. Improved economic activity and employment opportunities reduced the sale of gold by consumers to jewellery retailers in many parts of the world.

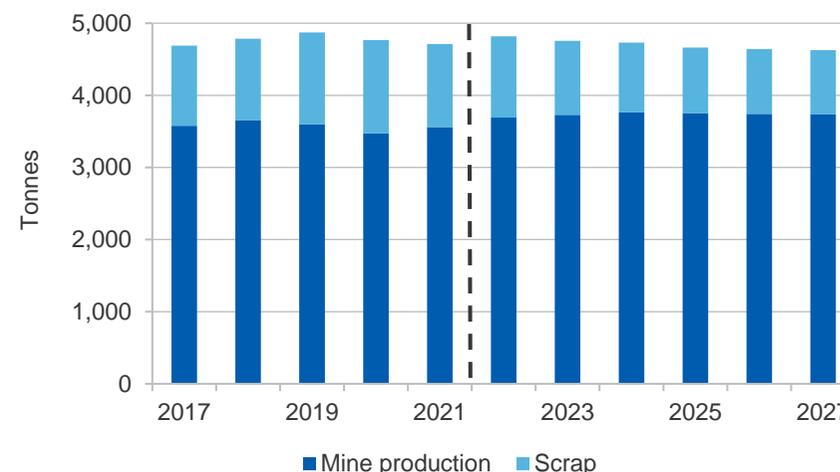
Offsetting the decline in gold scrap supply was a 2.5% year-on-year rise in world gold mine production to 3,561 tonnes, as the COVID-19 containment measures impacted less on production.

Gold mine production in Canada rose by 11% year-on-year to 189 tonnes in 2021, propelled by the ramp-up of production from new mines and the return to full production at the Musselwhite gold mine (following a fire incident in the March quarter 2019).

Indonesian gold mine output increased by 21% year-on-year to 122 tonnes in 2021, as the Grasberg gold mine ramped up underground operations.

Gold mine output in Mexico and South Africa in 2021 rose by 13% and 12% year-on-year, to 125 and 117 tonnes, respectively, as the COVID-19 pandemic impacted less on production and ore grades improved.

Figure 10.3: World gold supply



Notes: Net producer hedging is not included.

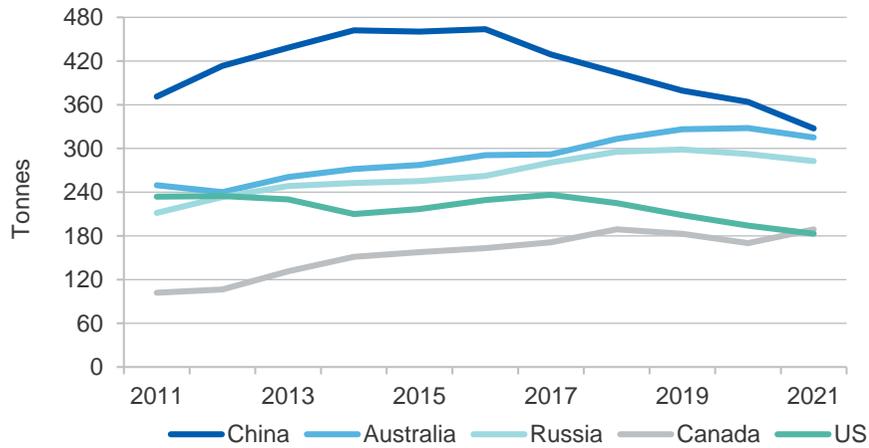
Source: World Gold Council (2022); Metals Focus (2022); Department of Industry, Science, Energy and Resources (2022).

Stricter environmental regulation and increased safety checks led to a 10% year-on-year decline in China's gold mine production to 328 tonnes in 2021.

Production in Australia decreased by 3.9% year-on-year to 315 tonnes in 2021 (see Section 10.5 *Australia's exports and production*).

Figure 10.4 shows the world's top five gold producing countries from 2011 to 2021. China remained the world's largest gold producer, at 328 tonnes in 2021, followed by Australia (311 tonnes), Russia (283 tonnes), Canada (189 tonnes), and the US (183 tonnes). China's gold mine production has declined significantly since 2016, due to stricter environmental regulations. Production in Australia rose for eight consecutive years (from 2012 to 2020), but declined in 2021 as labour shortages, plant maintenance and lower ore grades impacted.

Figure 10.4: Top 5 gold producing countries



Notes: 2021 data is provisional.
 Source: World Gold Council (2022); Metals Focus (2022); S&P Market Intelligence (2022); Department of Industry, Science, Energy and Resources (2022)

Figure 10.5 shows Russia's share of the world gold mine production, exports and imports. Russia is the world's third largest gold producing country, accounting for 8.4% of global gold mine production. Russia exported nearly US\$19 billion of gold in 2020, accounting for 5.7% of global gold exports. The country imported just US\$23 million of gold in 2020, accounting for 0.01% of global gold imports.

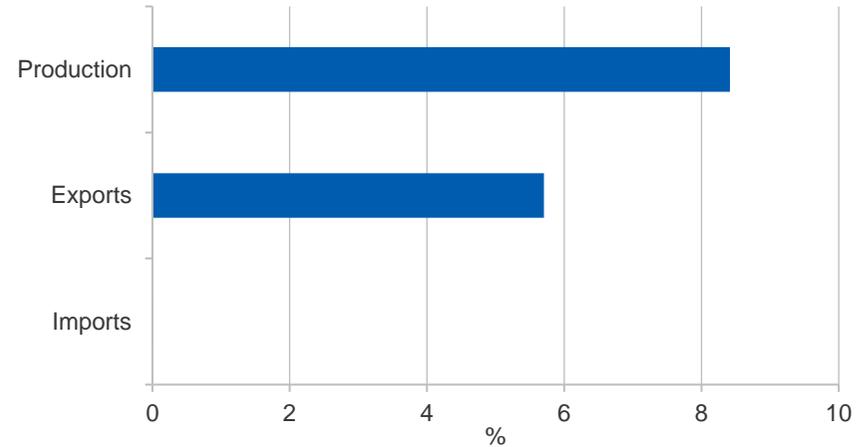
World gold supply to rise in 2022

Lower scrap supply will be more than offset by higher gold mine production, to see world gold supply increase by 2.7% to 4,791 tonnes in 2022 (Figure 10.3).

Lower gold prices and improving economic situations of many households are likely to discourage the sale of gold jewellery: gold scrap supply is forecast to fall by 2.0% to 1,127 tonnes in 2022.

World gold mine production is forecast to increase by 3.7% to 3,692 tonnes in 2022, driven by increased production in Australia, Canada, the US and Papua New Guinea (PNG).

Figure 10.5: Russia's share of global gold production and trade



Source: International Trade Centre (2021); S&P Market Intelligence (2022); World Gold Council (2022)

In Australia, a solid pipeline of projects is expected to bring the country's gold mine production to 305 tonnes in 2022.

Production in Canada and the US is forecast to increase by 19% and 9.8% to 225 and 201 tonnes in 2022, respectively.

Production in the PNG is forecast to increase by 31% to 55 tonnes in 2022, driven by a restart at Porgera gold mine, which has been in care and maintenance since April 2020.

World gold supply to fall after 2022

After 2022, world gold supply is projected to fall at an annual average rate of 0.7%, to reach 4,630 tonnes in 2027. Driving the fall will be lower gold recycling activities (Figure 10.3).

Gold scrap supply is projected to decline at an average annual rate of 4.6% over the outlook period, to 888 tonnes in 2027, as lower gold prices discourage gold selling in major jewellery consuming markets such as China and India.

Offsetting the fall in gold scrap supply is a forecast net rise in global gold mine production, as new mines come on stream and mine expansions occur; output is forecast to rise until 2024, reaching 3,767 tonnes, before falling to 3,737 tonnes in 2027. The decline in production in the final two years of the outlook period will be due to the closure of unprofitable gold mines in many parts of the world. Profitability will be squeezed by rising production costs and lower prices.

Gold output in Australia is expected to increase until 2025–26, propelled by mine expansions and new projects coming online (see Section 10.5 *Australia's exports and production*).

New projects in Canada, Chile, Brazil and Argentina are likely to increase gold output in North America and Central and South America by 124 and 82 tonnes, respectively, by 2026.

A continuation of strict environmental regulations and industry consolidation will see China's gold production fall over the outlook period.

10.4 Prices

Gold prices fell back in 2021 but have rebounded in early 2022

The global economic recovery has lifted real bond yields in recent months, undermining some of gold's appeal to institutional and retail investors. However, the strong inverse relationship between gold price and the real US 10-year Treasury bond yield seems to have weakened since early 2022: although real bond yields are higher now than they were in December 2021, tensions over the Russian invasion of Ukraine have seen the gold price rise by 7.4% since the start of 2022, reaching a 14-month high of US\$2,051 an ounce on 8 March 2022 (Figure 10.6).

On 16 March 2022, the US Federal Reserve raised the target for the fed funds rate by 25 basis points to 0.25%-0.5% — the first interest rate increase in more than three years.

Gold prices to fall in the short to medium term

Gold prices are projected to fall by an average 4.9% a year over the outlook period, from US\$1,770 an ounce in 2022 to US\$1,380 an ounce in

real terms in 2027 as accommodative monetary policies start to unwind as economies recover from the impacts of COVID-19. This is likely to be a major factor in curbing institutional investment demand for gold. With real interest rates increasing, the opportunity cost of holding gold will rise, lowering its attractiveness as an investment asset. The lower US dollar gold price, in combination with a higher Australian dollar, is expected to push the Australian dollar gold price lower, down from A\$2,410 an ounce in 2022 to A\$1,840 an ounce in real terms in 2027 (Figure 10.7).

Figure 10.6: Gold price and real US 10-Year Treasury Yield



Source: Bloomberg (2022)

There are several risks to the gold price assessment in 2022, including the arrival of any new COVID-19 variants. While the Omicron variant has proven less deadly than previous variants, new variants may be more successful in evading existing vaccines. A fresh COVID-19 outbreak would likely push the prices up. A further risk to the price assessment is the geopolitical issues between Russia and Ukraine. A faster than expected rise in real bond yields could lead to a steeper fall in gold prices.

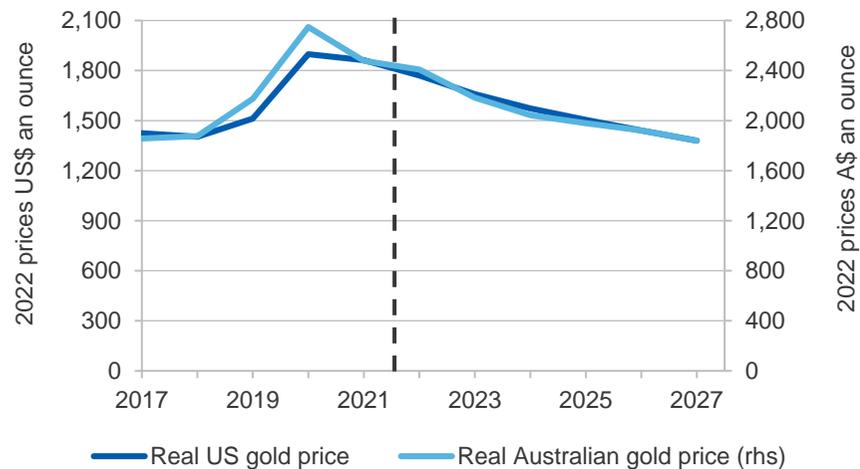
Conversely, slower unwinding of monetary policy stimulus would see slower declines in gold prices.

10.5 Australia's exports and production

Australia's gold exports fell in 2021

In 2021, Australia's gold exports fell by 11% year-on-year to \$24 billion (in real terms), due to a 16% year-on-year fall in export volumes, to 257 tonnes. Over this period, exports to the UK and the US dropped by 86% and 75% to 20 and 17 tonnes, respectively. Exports are volatile, often reflecting ETF flows.

Figure 10.7: US and Australian dollar real gold prices



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

By financial year, Australia's gold export earnings increased by 6.3% year-on-year to nearly \$27 billion in real terms in 2020–21, propelled by a 4.4% year-on-year rise in Australian dollar gold prices.

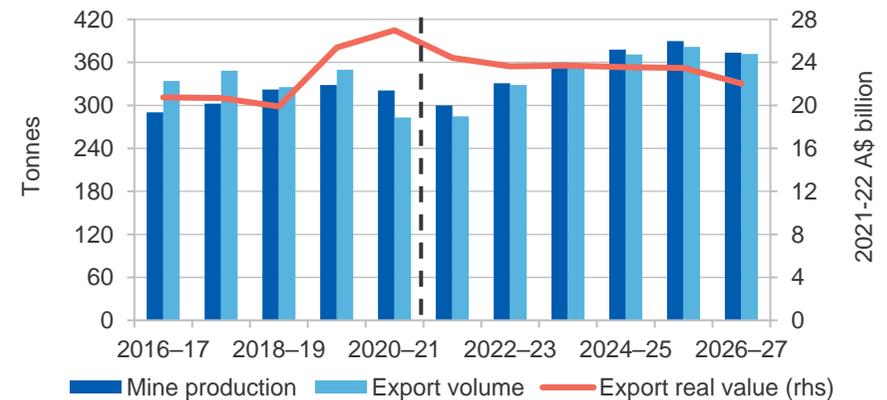
Offsetting the rise in gold prices, Australia's gold export volumes decreased by 19% year-on-year to 283 tonnes in 2020–21 (Figure 10.8). The decline was due to a 39% (or 68 tonnes) year-on-year fall in export

volumes to the UK and a 60% (or 29 tonnes) year-on-year fall in export volumes to Hong Kong.

Rising export volumes to support export earnings over the outlook period

Gold prices are projected to fall over the outlook period (see Section 10.4 prices). The reduction in gold prices is expected to boost jewellery consumption, and hence, Australian gold exports. Export volumes are projected to rise from 285 tonnes in 2021–22 to 382 tonnes in 2025–26.

Figure 10.8: Australia's gold mine production and exports



Notes: Export volume contains ash, waste and scrap gold, of which the gold content is unknown
Source: ABS (2022) International Trade, 5464.0; Department of Industry, Science, Energy and Resources (2022).

The rise in export volumes is likely to support export earnings, which are projected to remain at nearly \$24 billion a year in real terms until 2025–26 (Figure 10.8).

After 2025–26, Australia's gold export values are projected to fall to \$22 billion in real terms in 2026–27, due to lower gold prices and export volumes.

Figure 10.9 shows Australia's major gold export markets by percentage share. In 2021, China was Australia's largest gold export market,

accounting for 36% of total Australian gold exports. This was followed by Hong Kong (15%), Singapore (12%), India (nearly 12%), the UK (8.0%) and the US (7.0%).

Australia's gold mine production fell in 2021

Australia's gold mine production fell by 4.0% to 315 tonnes in 2021, impacted by the COVID-19 related labour shortages, plant maintenance, and lower ore grades.

In 2021, labour shortages affected gold output at some gold mines in Western Australia (WA). Production at AngloGold Ashanti and Regis Resources' Tropicana joint-venture gold project in WA fell by nearly 11% year-on-year to nearly 12 tonnes. Production at Regis Resources' Duketon gold project decreased by 4.6% year-on-year to 10 tonnes.

Production at Newcrest's Cadia mine in New South Wales (NSW) declined by 27% year-on-year to nearly 19 tonnes in 2021, due to planned maintenance in the September quarter 2021, which included replacement and upgrade of the mill motor.

Lower ore grades impacted output at a number of mines in Victoria and WA in 2021. This included Agnico Eagle's Fosterville gold mine in Victoria (down by 20% year-on-year to nearly 16 tonnes), and AngloGold Ashanti's Sunrise Dam in WA (down by 11% year-on-year to 7.1 tonnes).

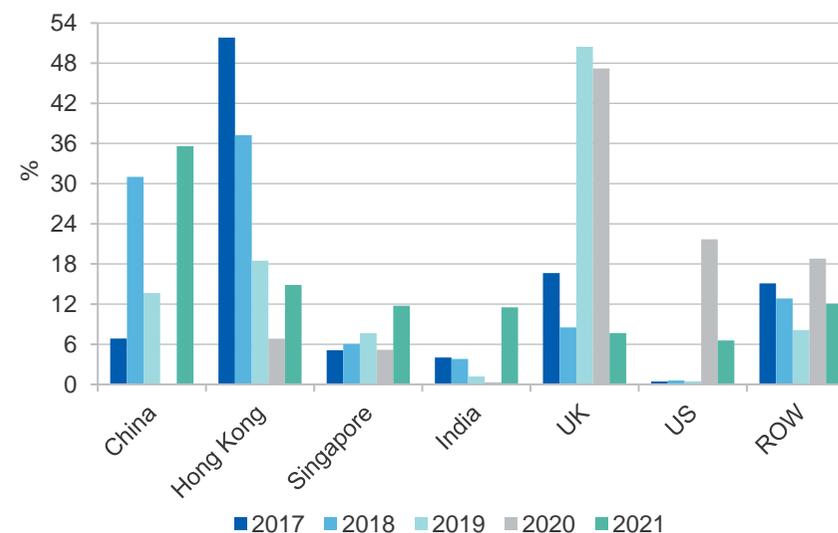
Higher gold mine production until 2025–26

Australian gold mine production is forecast to fall by 6.5% year-on-year to 300 tonnes in 2021–22, due to the impacts of the Omicron COVID-19 variant on mine operations.

Nineteen gold projects, worth \$5.1 billion, were at the committed stage of development in 2021. The largest of these is Newmont Mining's \$900 million Tanami Expansion 2 project in WA, and Newcrest's \$685 million and \$175 million Cadia Stage 1 and Stage 2 Expansion projects in NSW (Figure 10.10).

Sandfire Resources' 1.2 tonnes a year DeGrussa gold mine in WA is in its final year of scheduled operation. The mine is expected to close by the end of 2021–22.

Figure 10.9: Australia's major gold export markets (% share)



Notes: ROW: Rest of the world

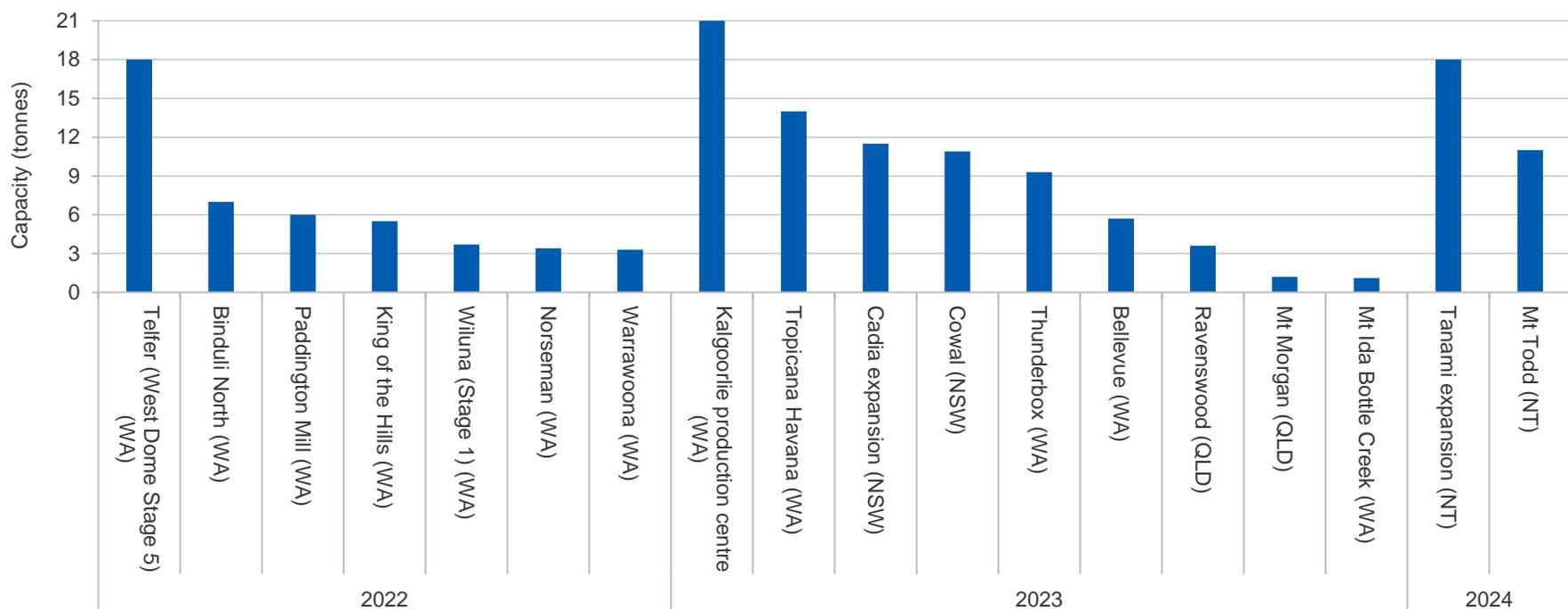
Source: ABS (2022) International Trade, 5464.0

After 2021–22, Australian gold mine production is projected to rise at an average 6.8% a year between 2022–23 and 2025–26, reaching a peak of 390 tonnes in 2025–26 (Figure 10.8). Growth is expected to be driven by mine reactivation and expansions, as well as production from new mines.

Red 5's 6.2 tonnes a year King of the Hills gold project in WA is on track to start production in mid-2022, with construction activities accelerating on multiple fronts. Ramelius Resources started mining at its Tampia mine in WA on 18 June 2021. It is expected that the mine will add 3.2 tonnes of gold to Australian gold output from 2021–22 and onwards.

Calidus' 4.3 tonnes of gold a year Warrawoona gold mine in WA is expected to commence production in the June quarter 2022.

Figure 10.10: Operational schedule and capacity of committed gold projects in Australia



Notes: Committed projects include new, expansion and reactivation projects. The operational schedule is estimated as at the end of October 2021.
Source: Department of Industry, Science, Energy and Resources (2022)

Newcrest has proceeded with the \$246 million West Dome Stage 5 Cutback project to extend the life of its Telfer mine in WA. The first ore from the cutback is expected in the first half of 2022.

Heritage Minerals plans to reopen the 1.6 tonnes a year Mount Morgan gold mine in Queensland in 2023. The mine was once one of the richest in the world, but was contaminated with acid water and abandoned in 1990. Four companies have previously attempted and failed to revive the historic mine site, which produced its first gold in 1882.

Bellevue Gold’s 5.7 tonnes a year Bellevue gold mine in WA is expected to come online in June 2023.

Vista Gold’s 11 tonnes a year Mt Todd in the Northern Territory is expected to restart in the March quarter 2024.

Gold production to eventually decline as reserves are exhausted

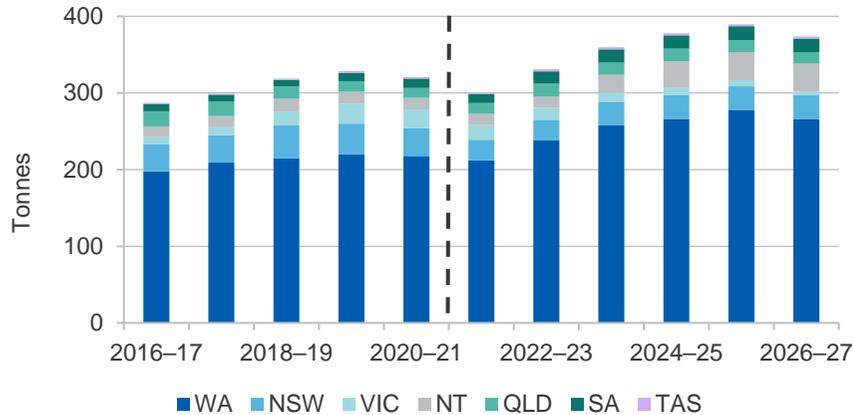
After reaching a peak in 2025–26, Australian mine output is projected to decline by 4.1% year-on-year to 374 tonnes in 2026–27 (Figure 10.8). Output will be weighed down by lower grade ores, reserve exhaustion and closures, exacerbated by falling gold prices (in real and nominal terms).

Western Australia is the centre of Australian gold production

In 2020–21, Western Australia was the largest gold producing state in Australia, accounting for 68% (or 218 tonnes) of Australian total gold mine

output, followed by New South Wales (11% or 36 tonnes), Victoria (7.6% or 24 tonnes), the Northern Territory (4.7% or 15 tonnes), Queensland (4.1% or 13 tonnes), South Australia (3.8% or 12 tonnes), and Tasmania (0.7% or 2.1 tonnes) (Figure 10.11).

Figure 10.11: Australia’s gold production by state and territory



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

At the end of the outlook period, Western Australia is expected to remain Australia’s largest gold mine producing state. Production in New South Wales and Victoria is expected to fall, whereas production in the Northern Territory, South Australia and Tasmania is expected to rise.

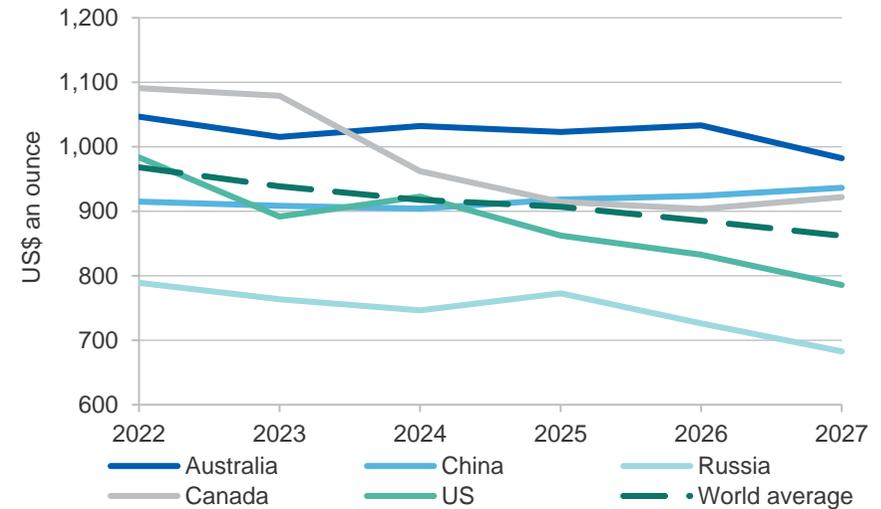
Australia’s gold mine production costs higher than the global average

Figure 10.12 shows gold production total cash and sustaining capex costs of selected major gold producing nations between 2022 and 2027. Australia’s gold mine production costs are forecast to be above the world average costs in the short to medium term. Australian gold miners are less competitive (have higher costs) than Chinese, Russian, and North American producers.

Exploration continued to rise in 2021

Australia’s gold exploration expenditure increased by nearly 22% in 2021 to \$1,601 million — accounting for 45% of Australia’s total minerals exploration expenditure during the year — driven by high US dollar and Australian dollar gold prices. Western Australia remained the centre of gold exploration activity in Australia, accounting for nearly 70% (or \$1,117 million) of total gold exploration expenditure (Figure 10.13).

Figure 10.12: Gold mine total cash and sustaining costs, selected countries



Notes: Total cash and sustaining capex costs include cash charged to production, realisation, depreciation, royalty, other indirect costs and sustaining capex.
Source: Wood Mackenzie (2022)

Revision to the outlook

The forecast for Australian gold mine production in 2021–22 and 2022–23 has been revised down from the December 2021 *Resources and Energy Quarterly* forecast. At 300 and 331 tonnes, we now expect output to be 17% and 12% lower than we did in December 2021. The downward revision reflects the larger than expected impacts of the Omicron variant

Figure 10.13: Australia's gold exploration expenditure



Source: ABS (2022) Mineral and Petroleum Exploration, Australia, 8412.0

on Australian gold mine production in the December quarter 2021, and the rising cases of COVID-19 in WA.

The forecast for Australian gold production in 2025–26 has been revised down by 4.6%, to 374 tonnes, from the March 2021 *Resources and Energy Quarterly* forecast. The downward revision reflects the larger than expected lower grade ores and reserve exhaustion.

The forecast for Australian gold exports in 2021–22 and 2022–23 has been revised down by 14% and 14% to \$24.4 billion and \$24.4 billion, respectively, reflecting a larger than expected fall in export volumes and values in the December quarter 2021. Other factor that contributes to the downward revision includes the COVID-19 containment measures in China and Hong Kong, due to rising COVID-19 cases. These COVID-19 containment measures are likely to impact Australian gold exports, as China and Hong Kong are Australia's two largest gold export markets.

Table 10.1: Gold outlook

World	Unit	2021	2022 ^f	2023 ^f	2024 ^f	2025 ^z	2026 ^z	2027 ^z	CAGR ^r
Total demand	t	4,021	4,061	4,230	4,542	4,805	4,879	4,925	3.4
Jewellery consumption	t	2,221	2,251	2,364	2,600	2,730	2,785	2,812	4.0
Mine production	t	3,561	3,692	3,729	3,767	3,755	3,744	3,737	0.8
Price ^c									
Nominal	US\$/oz	1,800	1,771	1,703	1,657	1,624	1,592	1,560	-2.4
Real ^d	US\$/oz	1,862	1,771	1,659	1,573	1,504	1,441	1,380	-4.9
Australia	Unit	2020–21	2021–22 ^f	2022–23 ^f	2023–24 ^f	2024–25 ^z	2025–26 ^z	2026–27 ^z	CAGR ^r
Mine production	t	321	300	331	360	378	390	374	2.6
Export volume	t	283	285	328	357	371	382	372	4.6
– nominal value	A\$m	26,105	24,425	24,376	25,098	25,580	26,137	25,124	-0.6
– real value ^e	A\$m	26,987	24,425	23,638	23,707	23,563	23,489	22,028	-3.3
Price									
– nominal	A\$/oz	2,481	2,457	2,310	2,191	2,144	2,130	2,101	-2.7
– real ^e	A\$/oz	2,565	2,457	2,240	2,069	1,975	1,914	1,842	-5.4

Notes: **c** London Bullion Market Association; **d** In 2022 calendar year US dollars; **e** In 2021–22 financial year Australian dollars; **f** Forecast; **z** Projection; **r** Compound annual growth rate for the period from 2021 to 2027, or from 2020–21 to 2026–27.

Source: ABS (2022) International Trade, 5465.0; London Bullion Market Association (2022); World Gold Council (2022); Department of Industry, Science, Energy and Resources (2022)