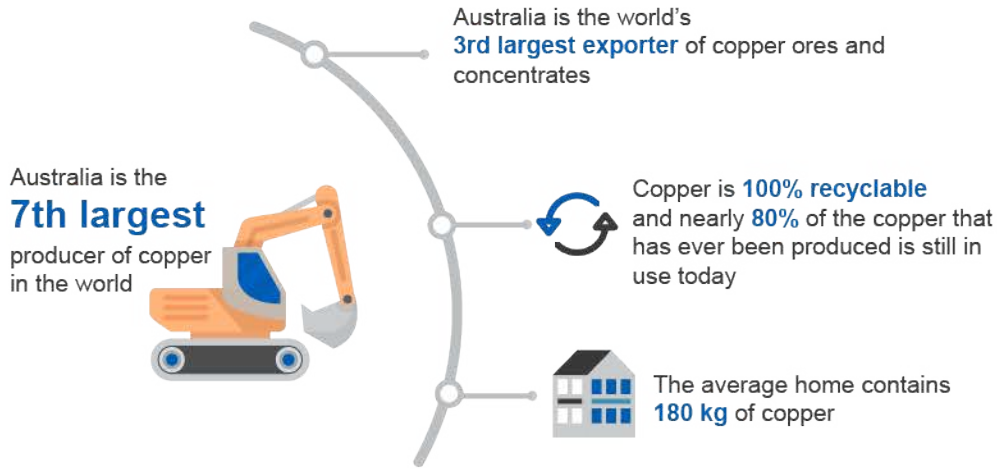


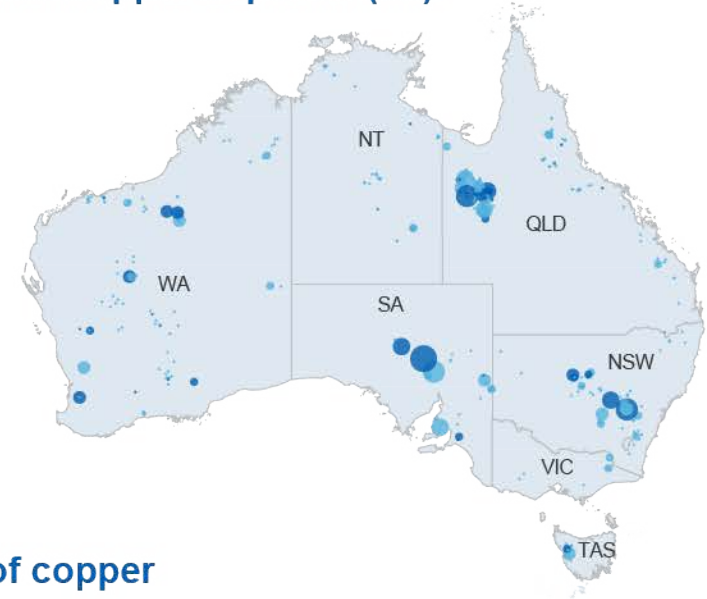
Copper

Resources and Energy Quarterly June 2019

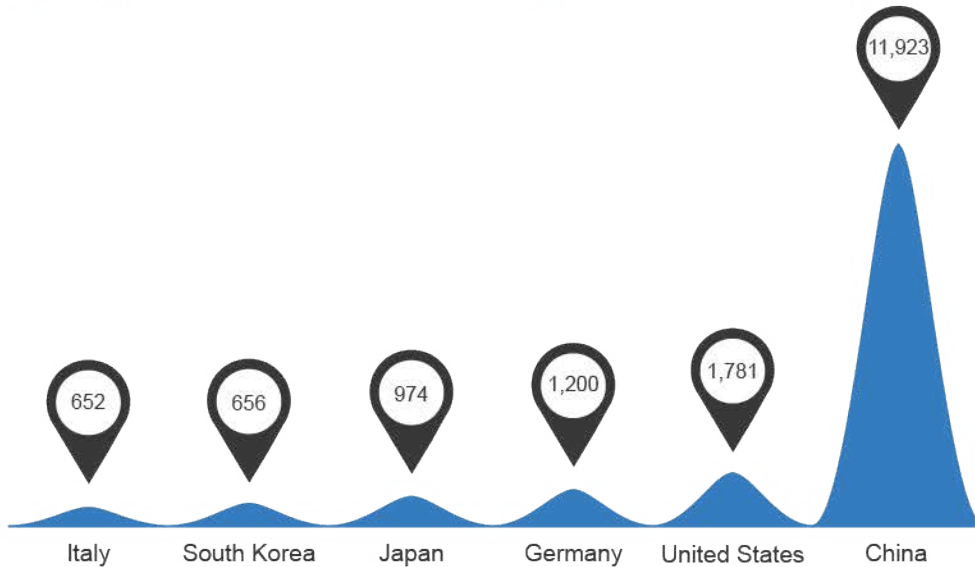


Major Australian copper deposits (Mt)

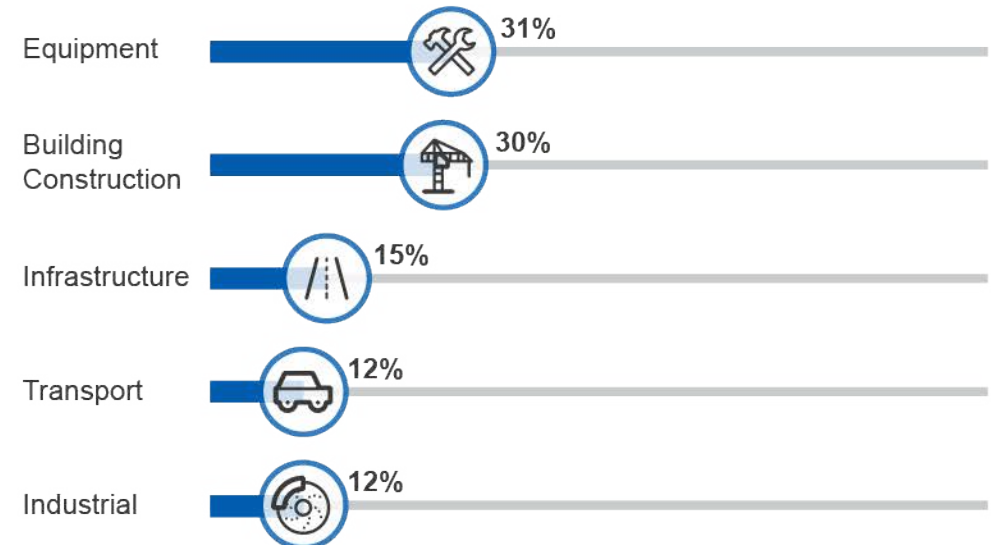
- <0.01
- 0.02
- 0.03–0.8
- 0.9–2.1
- 2.2–6.8
- >6.9
- Deposit
- Operating mine



Key copper consumer markets (thousand tonnes)



Global uses of copper



12.1 Summary

- Copper prices have fallen in recent months, as a result of lower consumption in China and expectations about the health of the world economy. This price trend is expected to turnaround over the outlook period, as expanding consumer markets lead to a market deficit and higher prices. The copper price is forecast to average over US\$6,480 a tonne in 2019, before increasing to US\$7,750 a tonne in 2021.
- Higher domestic copper output is expected to drive rising Australian export volumes, from an estimated 941,000 tonnes in 2018–19 to around 1.0 million tonnes (in metal content terms) in 2020–21.
- Australia’s copper export earnings are forecast to grow from an estimated \$9.5 billion in 2018–19 to \$12 billion in 2020–21, supported by both higher prices and export volumes.

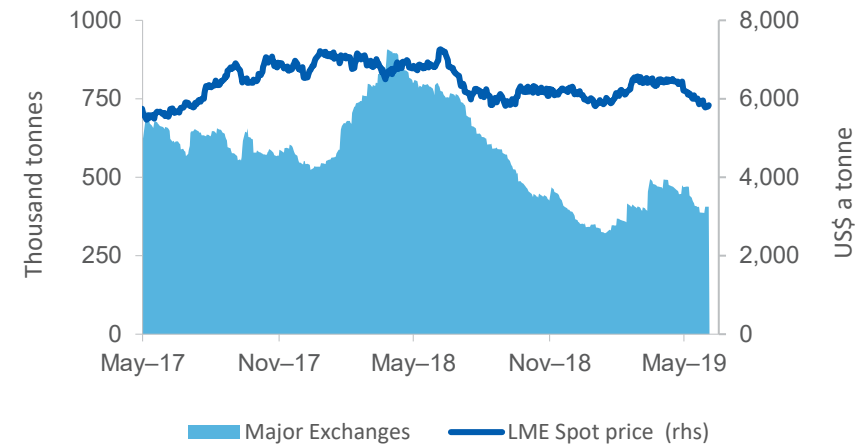
12.2 Prices

Copper prices knocked around by trade tensions despite market deficit

Copper prices have remained relatively solid in 2019, though with some recent weakness evident. Prices for the first six months of the year averaged \$6,179 a tonne, 10 per cent lower than the same period in 2018. The influence of the US-China trade tensions and expectations about negative impacts on copper consumption, resulted in some price volatility in the June quarter. The price hit a low of \$5,781 a tonne around the end of May (Figure 12.1).

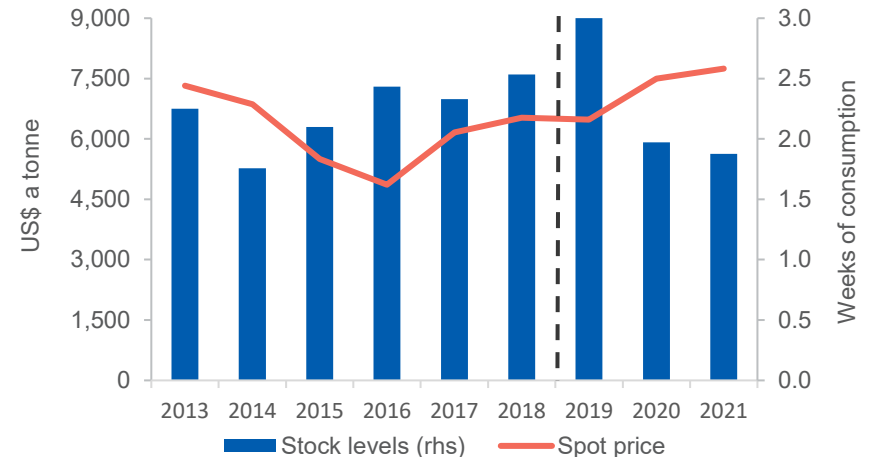
Consumption growth is expected to outpace production over the outlook period, leading to a steady increase in prices. Prices are forecast to grow at an average annual rate of 6.1 per cent over the outlook period, to average US\$7,750 a tonne in 2021 (Figure 12.2). Copper is heavily used in a number of expanding markets — transportation, energy infrastructure and energy storage. This means copper is intrinsically connected to the global economy, and any downturn in economic growth due to the escalation of the US-China trade tensions could thus pose a significant risk to the price outlook.

Figure 12.1: Recent copper spot price and stock movements



Source: LME (2019) official cash price; Bloomberg (2019) stock inventory at LME, COMEX and SHFE.

Figure 12.2: Outlook for copper prices and stocks



Source: LME (2019) official cash price; Department of Industry, Innovation and Science (2019)

12.3 World consumption

Expanding markets promote healthy consumption growth

Expanding markets in Asia, particularly in China, are expected to be the dominant driver of copper consumption growth, offsetting the impact of weaker economic activity and industrial production elsewhere. World copper consumption is forecast to increase at an average annual rate of 2.4 per cent over the outlook period, to reach 26 million tonnes in 2021 (Figure 12.3).

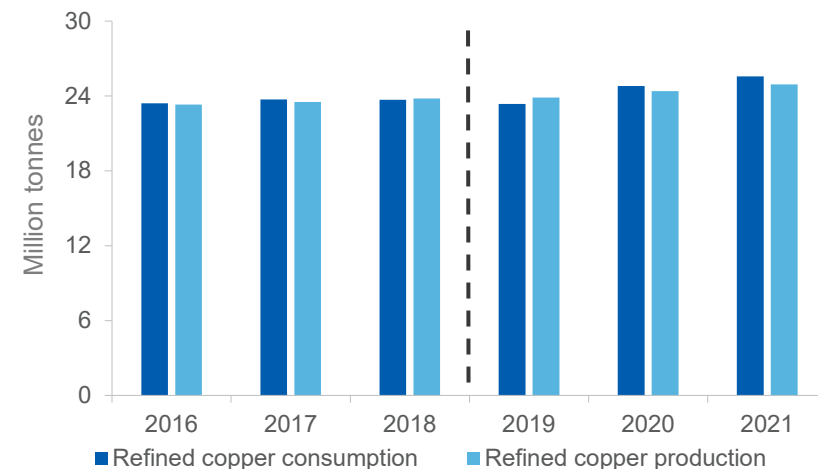
China accounts for around half of world refined copper consumption and is expected show the most significant growth over the outlook, as it upgrades its electricity generation and distribution infrastructure. Consumption is forecast to grow at an average 2.3 per cent a year to 2021, in part supported by targeted government stimulus.

Copper consumption in the US, Germany and India is also expected to show healthy expansion over the outlook period — the US and India are both forecast to increase consumption by 85 thousand tonnes between 2018 and 2021.

Technological advances are expected to stimulate refined copper consumption going forward, particularly with growing electric vehicle (EV) manufacturing. On average, EV's use more than four times as much copper as internal combustion engine vehicles and EVs account for a small but growing share of vehicle sales. China is the largest consumer market and EV sales averaged 6.2 per cent of all vehicles sales in the last two quarters. In China, EV sales have been supported by local and national government policies, however direct subsidies are now being phased out.

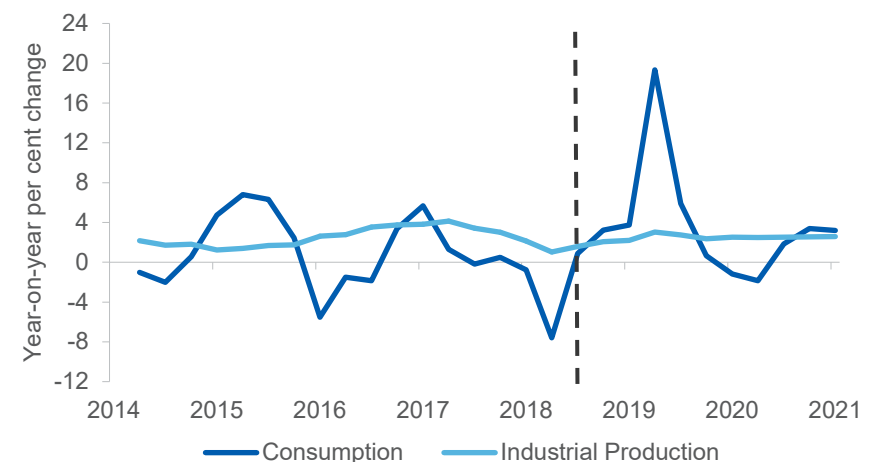
The consumption growth forecast comes with significant risks. Copper is fundamentally tied to industrial production and economic growth, so a decrease in world trade and industrial production over the coming years is likely to impact on usage (Figure 12.4). Increasing environmental restrictions around smelter activity may limit future activity, as shown by the ongoing closure of Vendanta Resources' Tuticorin smelter in India.

Figure 12.3: World balance of refined copper



Source: World Bureau of Metal Statistics (2019); Department of Industry, Innovation and Science (2019)

Figure 12.4: World copper consumption and industrial production



Source: World Bureau of Metal Statistics (2019); Bloomberg (2019) Netherland CPB; Department of Industry, Innovation and Science (2019)

12.4 World production

Constrained copper mine production to increase market deficit

World copper mine production is expected to grow modestly in 2019, before lifting strongly in 2020. Mine production is forecast to grow at an average annual rate of 3.3 per cent over the outlook period, increasing from 21 million tonnes in 2018 to 23 million tonnes in 2021 (Figure 12.6).

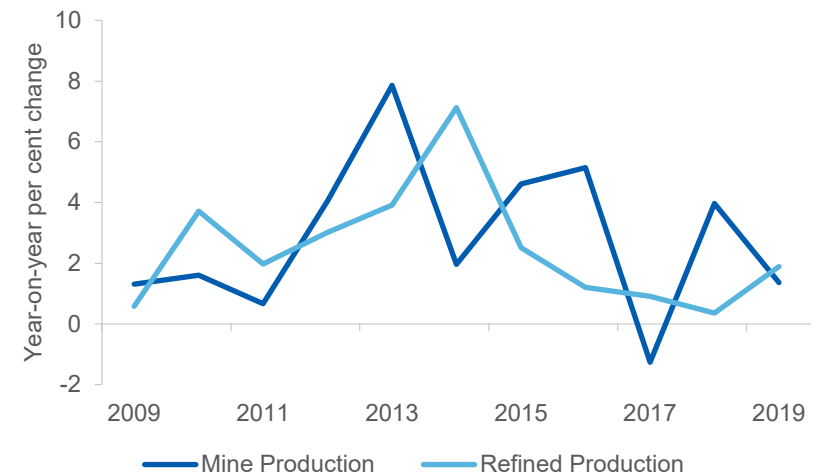
The deficit in the world markets is expected to grow over the outlook period. This is despite significant new production coming online. First Quantum's Cobre Panama mine, with a capacity of 340,000 tonnes has begun operations, and is expected reach 80 per cent capacity in the first half of this year. Higher production will also be supported by the completion of the Toquepala mine expansion in Peru. Annual production at the site is expected to increase by 52 per cent to 258,000 tonnes.

These (and other smaller production increases) are expected to offset decreased production in Indonesia and Zambia and weather disruptions elsewhere. Heavy rains in the March quarter reduced production at the Chuquicamata mine in Chile to the lowest level in over ten years. In June, the labour strikes halted production at the mine, which had not been resolved at the time of writing. A maintenance shut-down at the Qinghai Copper mine in China is also expected to affect production slightly in 2019.

Stronger copper prices are likely to be important in coming years to incentivise investment in new production, which will be needed to address the market deficit if consumption increases as expected (Figure 12.3).

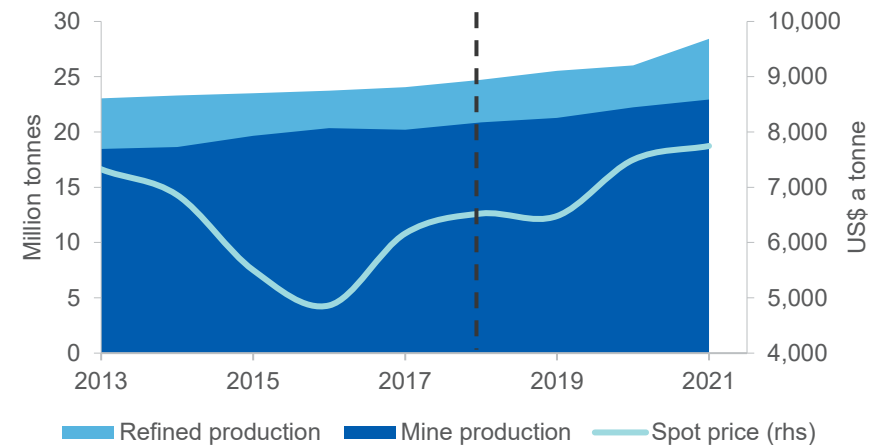
Refined copper production is expected to increase in 2019, as output returns to normal after the numerous outages and shutdowns of 2018. Output of refined copper is forecast to increase by an average rate of 2.7 per cent a year to reach 26 million tonnes in 2021, primarily supported by new refinery capacity in China. However, shortages in concentrate supply and tightening environmental restrictions may limit future production growth.

Figure 12.5: Change in output of mined and refined copper



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

Figure 12.6: World copper production and prices



Source: World Bureau of Metal Statistics (2019); Department of Industry, Innovation and Science (2019)

12.5 Australia

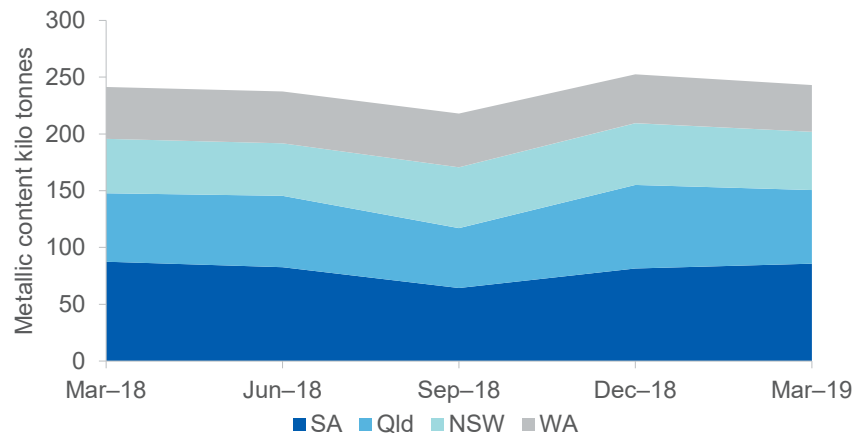
Mine production will be supported by rising output from existing mines

Australia's copper production is forecast to rise from 941,000 tonnes in 2017–18 to just over 1.0 million tonnes in 2020–21, growing at an average annual rate of 5.8 per cent. Higher output is expected to be driven by recovering production at BHP's Olympic Dam operations, following unexpected outages and scheduled maintenance at the end of 2018. Output will also be boosted by the start-up of OzMineral's Carrapateena mine in South Australia. Carrapateena has an annual production capacity of 4.3 million tonnes, and is expected to begin operations in the December quarter 2019.

Higher production supports growing copper exports

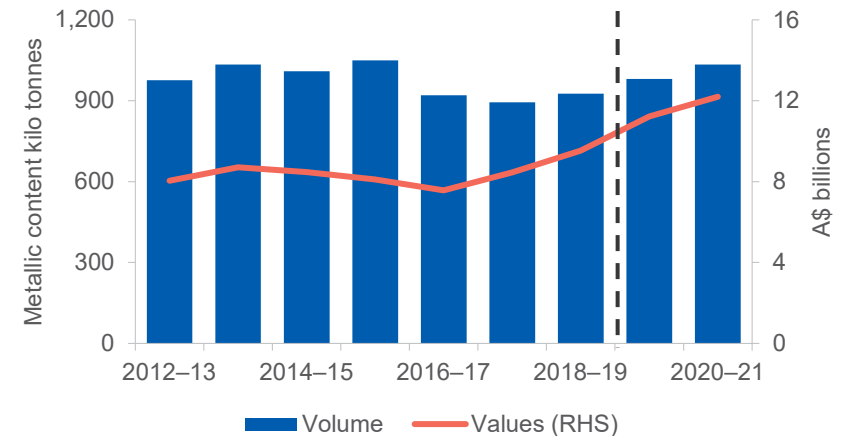
In line with higher production volumes, Australia's copper export earnings are forecast to increase from an estimated \$9.5 billion in 2018–19 to \$12 billion by 2020–21, growing at an average rate of 13 per cent a year (Figure 12.8). A moderately positive price outlook is also expected to support export earnings growth. However, this remains subject to a number of risks and uncertainties around the global copper price, as well as the outlook for global economic growth more broadly.

Figure 12.7: Australia's copper production by selected state



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

Figure 12.8: Australia's copper exports



ABS (2019) *International Trade in Goods and Services*, 5368.0; Department of Industry, Innovation and Science (2019).

Exploration activity continues to show strength

After showing consistent quarterly increases for the last two years, copper exploration activity decreased slightly in the March quarter 2019, to \$65 million.

Expenditure decreased in all major activity states, Queensland, New South Wales and South Australia. Despite this decrease, exploration activity is 42 per cent higher than the March 2018 quarter, and significantly higher than in recent years.

Revisions to the outlook

Australia's forecast copper export earnings for 2020–21 have been revised down by \$3.0 billion, driven by a less optimistic price outlook and changes in forecasts of production volumes.

Table 12.1: Copper outlook

World	Unit	2018	2019 ^s	2020 ^f	2021 ^f	Annual percentage change		
						2019 ^s	2020 ^f	2021 ^f
Production								
– mine	kt	20,789	21,282	22,229	22,939	2.4	4.5	3.2
– refined	kt	23,606	24,051	24,722	25,543	1.9	2.8	3.3
Consumption	kt	23,809	23,816	25,162	25,574	0.0	5.7	1.6
Closing stocks	kt	1 158	1 394	954	923	20.3	-31.6	-3.2
– weeks of consumption		2.5	3.0	2.0	1.9	20.3	-35.2	-4.7
Prices LME								
– nominal	US\$/t	6,525	6,480	7,498	7,748	-0.7	15.7	3.3
	USc/lb	296	294	340	351	-0.7	15.7	3.3
– real ^b	US\$/t	6,673	6,480	7,329	7,411	-2.9	13.1	1.1
	USc/lb	303	294	332	336	-2.9	13.1	1.1
Australia	Unit	2017–18	2018–19 ^s	2019–20 ^f	2020–21 ^f	2018–19 ^s	2019–20 ^f	2020–21 ^f
Mine output	kt	876	941	1,003	1,036	7.4	6.6	3.3
Refined output	kt	369	417	395	398	12.9	-5.3	0.9
Exports								
– ores and cons. ^c	kt	1,987	1,985	2,226	2,422	-0.1	12.1	8.8
– refined	kt	317	370	346	348	16.8	-6.6	0.6
– total metallic content	kt	894	927	983	1 037	3.6	6.1	5.5
Export value								
– nominal	A\$m	8,451	9,511	11,221	12,198	12.5	18.0	8.7
– real ^d	A\$m	8,619	9,511	10,958	11,626	10.3	15.2	6.1

Notes: **b** In 2019 calendar year US dollars; **c** Quantities refer to gross weight of all ores and concentrates; **d** In 2018–19 financial year Australian dollars; **f** Forecast;

Source: ABS (2019) International Trade, 5465.0; LME (2019) spot price; World Bureau of Metal Statistics (2019) World Metal Statistics; Department of Industry, Innovation and Science (2019)