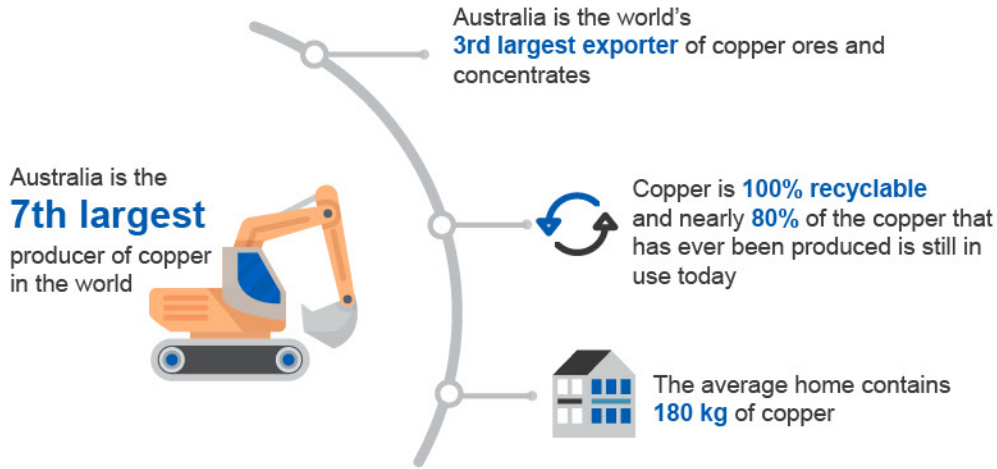


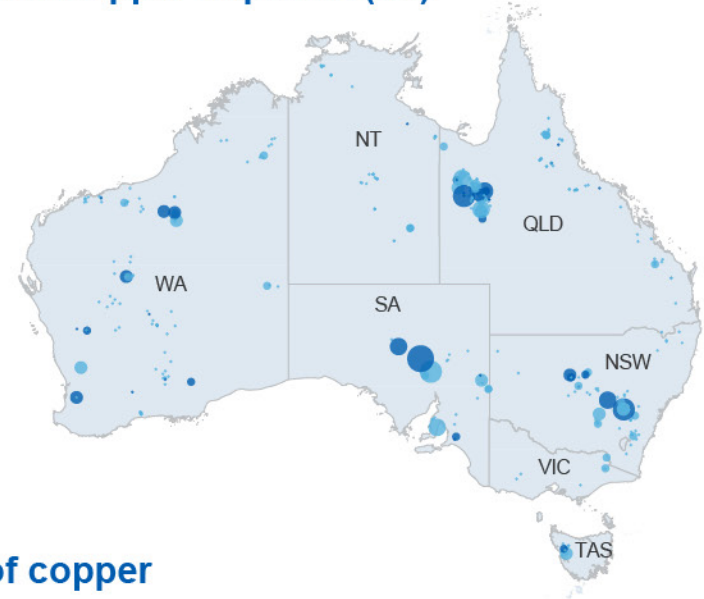
# Copper

Resources and Energy Quarterly March 2019

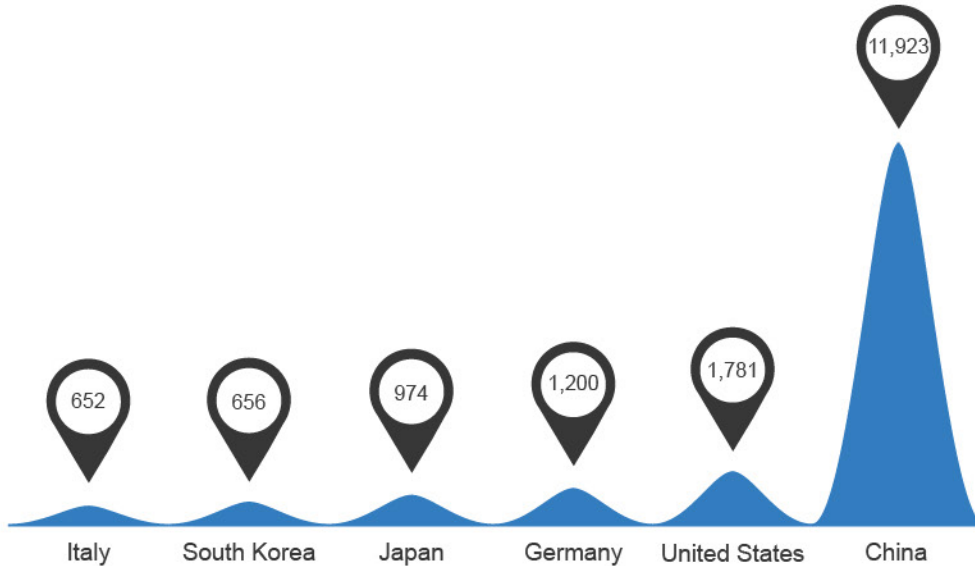


## Major Australian copper deposits (Mt)

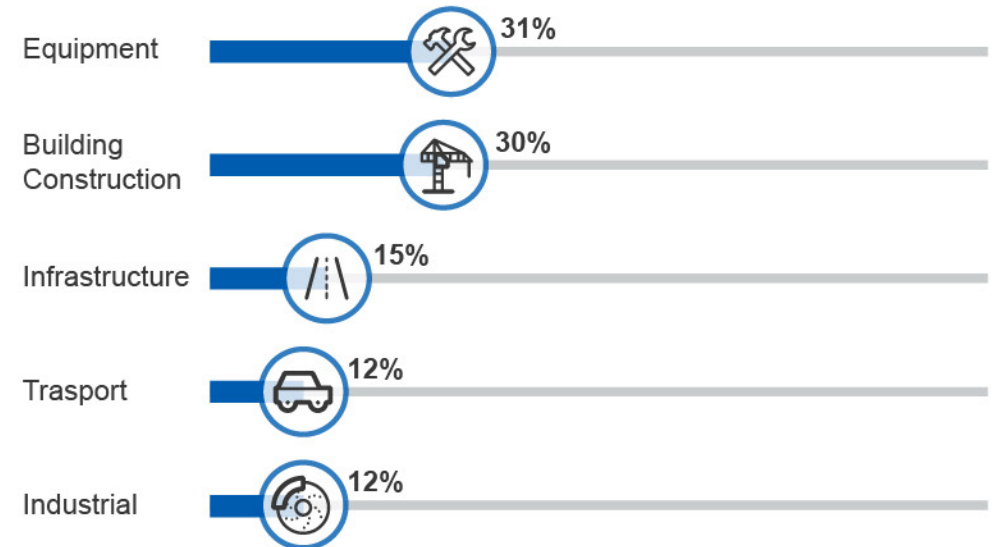
- <0.01
- 0.02
- 0.03–0.8
- 0.9–2.1
- 2.2–6.8
- >6.9
- Deposit
- Operating mine



## Key copper consumer markets (thousand tonnes)



## Global uses of copper



## 12.1 Summary

- Trade tensions continue to hold copper prices down, despite rising demand and falling inventories. Prices are currently around US\$6,300 per tonne, with a slow rise evident early in 2019. With inventories near record lows, prices are expected to rise significantly, to just under US\$7,000 in 2019 (in real terms), then to around US\$8,500 by 2021, before easing back in subsequent years.
- Australia's copper exports are forecast to rise from 894,000 tonnes in 2017–18 to around 1.1 million tonnes (in metal content terms) by 2023–24, driven by rising supply from new and existing mines.
- Australia's real copper export earnings are forecast to lift in real terms, from \$8.6 billion in 2017–18 to \$10.8 billion by 2023–24. Export earnings should benefit from price growth over the outlook period, as well as rising production at several new mines.

## 12.2 Prices

Copper prices are surprisingly low, with inventories having fallen sharply during 2018

Copper prices are starting to show signs of strength early in 2019, after a long period of decline during the latter half of 2018. This decline was largely a result of rising US-China trade tensions, with the outbreak of tensions and exchange of tariffs between the countries producing a substantial fall in copper prices from a mid-year peak. Although copper prices have not fallen significantly since July, there has been little sign of any recovery, with prices at the end of 2018 being 15 per cent below the level at the start of the year, at just over US\$6,000. Prices have begun to lift early in 2019, but remain well below what market conditions would normally suggest.

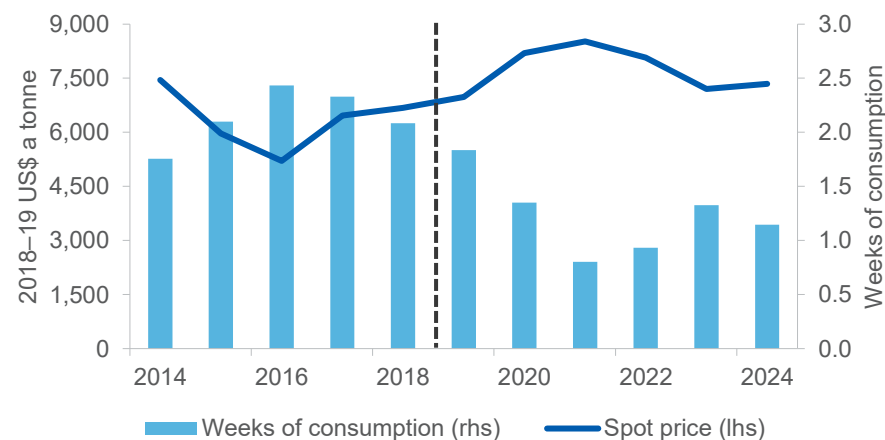
Copper demand outstripped supply during 2018 and sent inventories down sharply in the second of the year. Stocks at the London Metal Exchange (LME) fell by more than two-thirds between May and December of 2018, from almost 400,000 tonnes to less than 125,000 tonnes.

Historically low copper stocks in conjunction with still-rising demand are likely to force prices back up in 2019, although trade tensions are still ongoing. Supplies are now barely sufficient to meet 12 days of industrial demand — a notable risk given the large array of technical and industrial functions which rely on copper.

Copper price rises have historically been rapid and large, but trade tensions may counter-balance some of the gains. However it is also possible that investors will pay less heed to trade tensions and associated risks over time as markets adapt to the situation.

Significant uncertainties remain in the copper price outlook. Should global GDP growth ease back in 2019, prices will likely be weighed down. Even if global conditions remain strong, the prospect of further US interest rate rises could weigh on copper prices by strengthening the dollar. Overall, copper prices are forecast to rise in real terms to US\$6,978 in 2019 before peaking in 2021 and edging back to US\$7,342 by 2024 (Figure 12.1).

Figure 12.1: Outlook for copper stocks and prices



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

## 12.3 World consumption

### Copper consumption is set for solid growth over the next five years

Growth in copper demand is currently exceeding growth in supply, leading to growing pressure on inventories. Industrial production (Figure 12.2) and power grid investment remain the primary drivers of growth in copper consumption. The largest source of growth in power and infrastructure investment is still China (Figure 12.3), although other Asian nations are also increasing their copper use. Among other countries, copper demand is being supported (albeit to a lesser degree) by growing uptake of consumer wireless technology and battery systems.

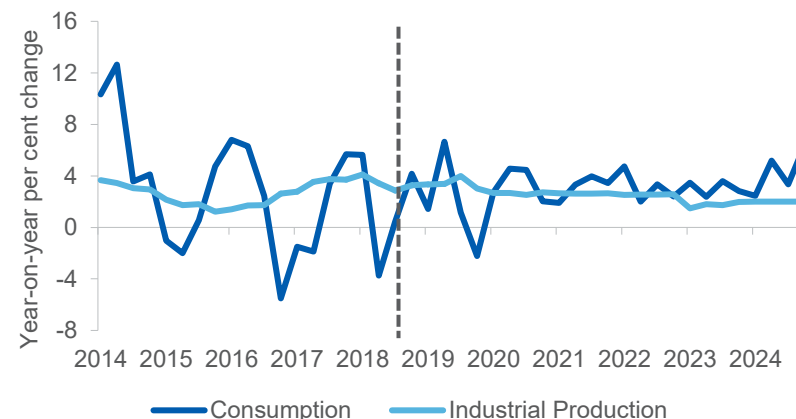
Demand growth over the second half of 2018 was impacted, in part, by consumer uncertainty over US-China trade tensions, which led to Chinese GDP growth falling slightly short of expectations. Trade tensions may continue to drag on global GDP and copper demand through 2019, though growth in both is still expected. Importantly, Chinese copper demand has remained relatively robust through two rounds of US tariff rises, supported by high residential construction and fixed asset investment.

The long-mooted plans for infrastructure development in the US now appear likely to fall short of initial expectations, leading to a probable reduction in demand pressures over 2019. Despite this, demand is expected to continue exceeding supply out to 2020 or 2021, leading to persistent inventory pressure and adding to the chance of a breakout in copper prices over the outlook period.

After 2022, electric vehicles are likely to take over as the primary source of growing copper demand. Power grid investment (in the short-term) and electric vehicle rollouts (in the medium-term) are projected to push up copper demand, from 24.0 million tonnes in 2018 to 29.0 million tonnes by 2024.

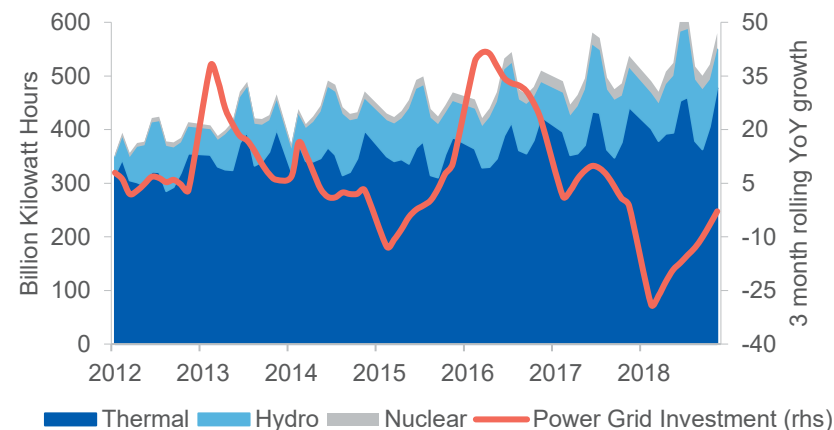
The key risk remains that of a trade tension-induced global economic downturn, which would severely affect copper demand and induce potentially significant falls in copper use across the Chinese and broader Asian economy.

Figure 12.2: World copper consumption and industrial production



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

Figure 12.3: Growth in China's energy sector



Source: Bloomberg (2018) National Bureau of Statistics China; Department of Industry, Innovation and Science (2018)

## 12.4 World production

### World copper mine production has been constrained by supply disruptions

Supply remains tight in copper markets, with mine production constrained by a lack of significant copper developments over the last 10 years. Supply pressures extend to the refinery stage, where new emissions limits in Chinese smelters, and sulphur capture limits in Chile, have led to some constraints on refined copper output (Figure 12.4). Operational problems in Peru have also affected mined supply growth over the past year, leading to a higher market deficit and dramatic fall in metal inventories in exchange warehouses over 2018.

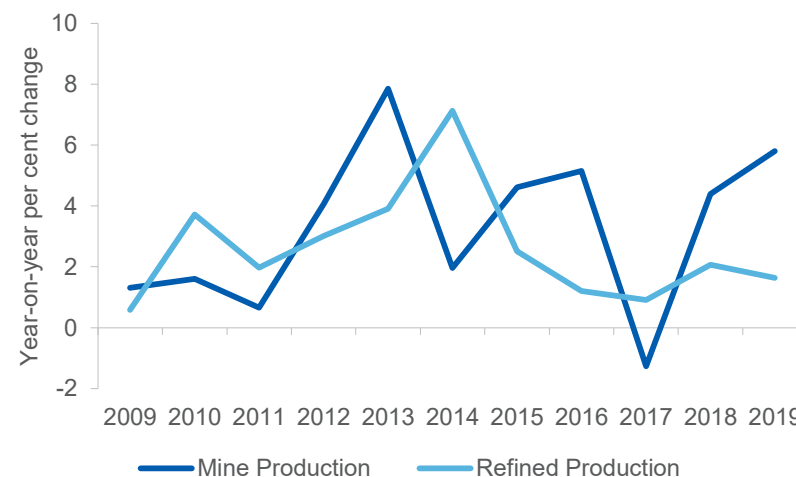
New output is expected from First Quantum Minerals' Cobre mine in Panama over 2019, and significant further supply is expected in subsequent years from Australia, South America and India. All three countries have begun the process of tapping promising new deposits and the Indian Government has made significant policy moves to support higher output and reduce production costs.

However, this supply will not come soon enough to prevent rising pressure in the short term. This pressure may even be aggravated by the fatal collapse of Vale's Brumadinho iron ore tailings dam in Brazil. Brazil's subsequent ban on upstream tailings dams is likely to affect copper production in the country over the next few years.

Several refineries are also facing delays and difficulties, including the Oyu Tolgoi project in Mongolia which has been unable to secure domestic power supplies. Vedanta's Sterlite smelter in Tamil Nadu state in India has been shut down, after high levels of iron, lead, and cadmium were discovered in nearby groundwater. The shutdown is being challenged in court, but is likely to persist for some time, and may be permanent.

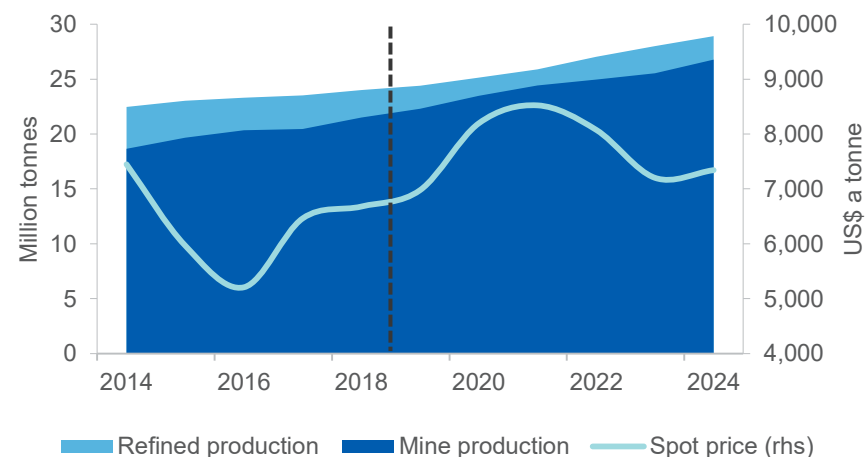
As new mined supply enters markets after 2020, and refineries resolve some of the current issues, markets are expected to come into balance, with inventories starting to rebuild. Supply of refined copper is expected to grow modestly in 2019, and more rapidly after 2020, growing from 24.0 million tonnes in 2018 to 28.9 million tonnes by 2024 (Figure 12.5).

Figure 12.4: Mined and refined copper output



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

Figure 12.5: 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

Australian production is projected to rise from 885,000 tonnes in 2017–18 to 1.1 million tonnes by 2023–24. In the near term, rising output is expected from Newcrest’s Cadia Valley mine in NSW and CoDeco’s Rocklands project in Queensland. Sterlite Industries’ Mount Lytell mine in Tasmania, which is emerging from care and maintenance, is also expected to return to full operation in 2019.

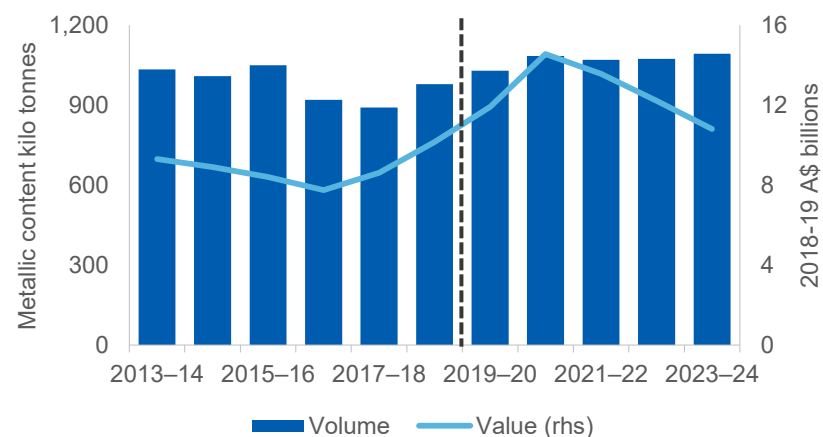
Over the longer term, several large new deposits may be unlocked. BHP’s Oak Dam West project near Olympic Dam in South Australia and Rio Tinto’s Wino resource in Western Australia are both under review at present, though full production will likely not commence within the outlook period. Havilah Resources has also announced that more than 450,000 tonnes of contained copper have been discovered at Kalkaroo in South Australia. The site is expected to yield a higher copper-equivalent grade of 0.74 per cent, above that of most Australian sites.

Production may also increase from Olympic Dam, where BHP is currently considering a \$3 billion expansion of the mine. This expansion would lift copper output from the facility by almost 75 per cent to around 350,000 tonnes per year, though the timing for the upgrade is not yet clear.

### Copper exports are expected to keep rising over the outlook period

Australia’s copper export earnings are expected to increase from \$8.6 billion in 2017–18 to more than \$14 billion in 2020–21 (Figure 12.6) as new supply commences and copper prices lift sharply from their current low. Falling prices are expected to reduce export earnings somewhat in the subsequent years.

Figure 12.6: Australia’s copper exports



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

### Exploration expenditure continues to gather pace

Copper exploration spending continues to rise, lifting from \$73.2 million in the September quarter to \$81.6 million in the December quarter. Copper exploration spending has almost doubled over the last year, with growth driven in large part by rising exploration in Western Australia and South Australia. Exploration is also growing in NSW and Queensland, though at a more modest pace.

### Revisions to the outlook

Australia’s forecast copper export earnings for 2018–19 and 2019–20 have not been revised significantly.

**Table 12.1: Copper outlook**

World	Unit	2018 <sup>s</sup>	2019 <sup>f</sup>	2020 <sup>f</sup>	2021 <sup>f</sup>	2022 <sup>z</sup>	2023 <sup>z</sup>	2024 <sup>z</sup>	CAGR <sup>r</sup>
Production									
–mine	kt	21,080	22,303	23,482	24,426	24,964	25,536	26,780	4.1
–refined	kt	24,008	24,401	25,140	25,893	27,040	28,011	28,920	3.2
Consumption	kt	24,025	24,502	25,345	26,148	26,959	27,785	28,990	3.2
Closing stocks	kt	966	864	658	403	484	709	639	-6.7
–weeks of consumption		2.1	1.8	1.4	0.8	0.9	1.3	1.1	-9.5
Prices LME									
–nominal	US\$/t	6,525	6,978	8,384	8,909	8,627	7,861	8,191	3.9
	USc/lb	296	316	380	404	391	357	372	3.9
–real <sup>b</sup>	US\$/t	6,679	6,978	8,195	8,522	8,076	7,202	7,342	1.6
	USc/lb	303	316	372	387	366	327	333	1.6
Australia	Unit	2017–18	2018–19 <sup>f</sup>	2019–20 <sup>f</sup>	2020–21 <sup>f</sup>	2021–22 <sup>z</sup>	2022–23 <sup>z</sup>	2034–24 <sup>z</sup>	CAGR <sup>r</sup>
Mine output	kt	885	1,019	1,034	1,068	1,053	1,057	1,076	3.3
Refined output	kt	367	409	397	397	397	397	397	1.3
Exports									
–ores and cons. <sup>c</sup>	kt	1,987	2,129	2,336	2,549	2,491	2,507	2,580	4.4
–refined	kt	317	378	364	364	364	364	364	2.3
–total metallic content	kt	894	981	1 030	1 086	1 070	1 075	1 094	3.4
Export value									
–nominal	A\$m	8,451	10,195	12,214	15,290	14,597	13,484	12,234	6.4
–real <sup>d</sup>	A\$m	8,619	10,195	11,928	14,573	13,569	12,225	10,819	3.9

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; **z** Projection; **r** Average annual growth between 2018 and 2024 or 2017–18 and 2023–24.

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)