Copper

Resources and Energy Quarterly December 2018

Australia is the 7th largest producer of copper in the world.

Australia is the world's 3rd largest exporter of copper ores and concentrates.

Copper is 100% recyclable and nearly 80% of the copper that has ever been produced is still in use today.

The average home contains 180 kg of copper.

Major Australian copper deposits (Mt)
- <0.01
- 0.02
- 0.03–0.8
- 0.9–2.1
- 2.2–8.8
- >6.9

The map shows the location of copper deposits in Australia with states and territories labeled.

Key copper consumer markets (thousand tonnes)
- Italy: 652
- South Korea: 666
- Japan: 674
- Germany: 1,200
- United States: 1,761
- China: 11,923

Global uses of copper
- Equipment: 31%
- Building Construction: 30%
- Infrastructure: 15%
- Transport: 12%
- Industrial: 12%
12.1 Summary

- Recent trade tensions have left copper prices well below levels seen during early 2018, but signs of recovery have become evident as market fundamentals re-assert themselves. Supply shortfalls are expected over the outlook period, with prices forecast to rise from US$6,430 a tonne in 2018 to US$8,013 by 2020.
- Australia’s copper exports are forecast to rise from 892,000 tonnes in 2017–18 to over 1 million tonnes (in metal content terms) by 2019–20.
- Australia’s copper export earnings are forecast to lift from $8.4 billion in 2017–18 to $10.9 billion by 2019–20. Export earnings should benefit from price growth as well as rising production at several mines.

12.2 Prices

Copper prices are starting to recover

The monthly average copper price rose to over US$7,000 at the start of 2018, but has subsequently fallen significantly. Prices dropped particularly sharply in July and August, reaching around US$6,000. Some recovery has been evident in the December quarter, with prices lifting to US$6,300 in November. Much of the fall in prices reflects ongoing trade tensions between the US and China, which represent a significant risk for the global economic outlook (see chapter two on trade tensions). However, there are signs that copper markets may be shifting to a more long-term view in light of emerging issues with supply, which is expected to be in deficit in 2019 and 2020. Copper supply is expected to remain relatively flat over the outlook period, while demand rises (Figure 12.2), supported by resilient Chinese imports and increases in electric vehicle sales.

As market fundamentals re-assert, copper prices are expected to rise to US$6,434 a tonne in 2019 and US$8,013 in 2020 (Figure 12.1). This would effectively bring prices back above the recent peak (at just over US$7,000 a tonne) of early 2018. Should market deficits persist, copper prices could approach the historical highs of 2011.
12.3 World consumption

Copper consumption is set for solid growth over the next two years

Global copper consumption is projected to rise from 23.8 million tonnes in 2018 to 25.6 million tonnes by 2020. Solid growth in industrial production is ongoing (Figure 12.3), and copper consumption is rising as the development of new consumer wireless technology and battery systems accelerate. Recent solid growth in global GDP may also have encouraged global manufacturers to recommit to purchases previously placed on hiatus.

Thus far, Chinese copper demand has largely withstood the threat of trade tensions, remaining solid despite two rounds of sanctions. China uses around half of all copper produced globally, and a solid pace of residential construction continues to underpin solid rises in Chinese copper use. Chinese fixed asset investment is also starting to show tentative signs of turning, after some sharp declines (Figure 12.4).

Chinese manufacturers have stepped up output over the last few months, attempting to maximise export revenues ahead of the third round of US tariffs, whose ultimate impact remains unclear for the time being. Chinese copper imports are expected to remain steady over the final quarter of 2018, but there is potential for declines in 2019 should US tariffs remain in place (see chapter two on trade tensions).

Copper markets are likely to evolve over time, with rising electric vehicle production leading to surging copper demand across a number of facilities and countries. This should help to broaden the base for copper consumption, reducing the current heavy dependency on China and adding some resilience to global copper markets.

A broader market with less vulnerability to bilateral tensions could improve the investment climate, supporting long-term planning and helping to keep demand and supply more closely matched over the longer term.

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**Figure 12.3: World copper consumption and industrial production**


**Figure 12.4: Growth in China’s energy sector**

12.4 World production

World copper mine production has been constrained by supply disruptions

Copper production continues to face disruptions: industrial action in Chile, export curbs in Indonesia and cuts in recycled supply from China all affected production in the first half of 2018. More recent disruptions include a dispute over export duties between Katanga mining and the government of the Democratic Republic of Congo, which halted a large flow of copper exports from the country.

Chile — the world’s largest copper supplier — faces mixed supply conditions and a recent trend of disruption. Output from Chile appears to be increasing, with supply over the nine months to September up by more than 7 per cent from the corresponding period a year ago. However, several potential constraints on production in Chile are emerging. Among these, Codelco has reported a significant decline in ore quality at most of its Chilean mines over the September quarter, with quarterly metal output falling significantly as a result. Several potential upgrades to mining facilities in Chile have also been postponed — as a result of volatile prices and trade tensions — which have clouded supply forecasts.

On the upside, the threat of industrial action at Escondida — the world’s largest copper mine — appears to have virtually vanished, after a deal was reached in August. This should help to improve stability of supply over the outlook period. Trade tensions are persistent, however, and remain the most significant risk factor in the short term.

Mine production growth is not expected to match demand

Rising output from South Asia and South America should support a lift in global copper mine production, which is forecast to rise from 21.5 million tonnes in 2018 to 23.5 million tonnes in 2020 (Figure 12.6). The largest drivers of growth are expected to be First Quantum Minerals’ new Cobre Panama mine (expected to produce 330,000 tonnes annually from 2019) and Qulong’s new copper mine in Tibet (supplying 120,000 tonnes).
Outside of this, the pipeline of new copper mines remains relatively constrained, and dominated by Chinese participation. Rising Chinese investment in Estonia and central Africa reflects recent stagnant growth in its domestic copper output, where efforts have been made to curb production at the most environmentally-damaging facilities.

Ramp-ups at other marginal facilities around the world may potentially be postponed or paused, in light of rising trade tensions between the US and its trading partners. Volatile prices and broader trade uncertainties have deprived potential mines of capital and forced a shift towards alternative sources such as private equity. A supply shortfall of about 300,000 tonnes is expected in 2019, with stocks already declining (Figure 12.7). This shortfall may rise after 2020 as demand grows for electric vehicles.

However, this looming shortfall is now starting to drive significant new interest in copper exploration, with around US$10 billion expected to be invested in 2018. This is around 20 per cent higher than the total for 2017. Recent research by S&P Global Market Intelligence suggests that the cost of buying existing mines has, on balance, started to exceed the cost of developing new ones. The cost to purchase acquired reserves rose by almost $750 a tonne between 2007 and 2016, compared to the previous ten years. The average unit cost of exploration-derived reserves rose by only a little over US$50 per metric tonne over the same period. This shift may help to switch the investment incentive more towards discovery of new deposits in the years to come.

World refined copper output is expected to rise over the outlook period. World refined copper output is forecast to grow from 24.0 million tonnes in 2018 to 25.2 million tonnes in 2020. Output is rising most rapidly in Africa and South America, with some growth also evident in Indonesia.

Secondary production is falling in China, following a reduction in Chinese imports of low grade scrap (Figure 12.8). This has created opportunities for Thailand and the Philippines to move into this market, and could reduce the impact of US-China trade tensions in the long term.
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 just over 1 million tonnes in 2019 and 2020. Higher output is expected from Newcrest’s Cadia Valley mine and CoDeco’s Rocklands project in Queensland. Sterlite Industries’ Mount Lytell mine, which is emerging from care and maintenance, is also expected to return to full operation in 2019.

A substantial new ore body was discovered in the second half of 2018, with Havilah Resources announcing that its reserves at Kalkaroo are expected to exceed 450,000 tonnes. The site is also estimated to hold more than 1.4 million ounces of co-located gold. This would make the company’s Kalkaroo project the largest undeveloped copper-gold deposit currently known in Australia, and the second largest in the world after the Productora deposit in Chile. The site is expected to yield a higher copper-equivalent grade of 0.74 per cent, above that of most Australian sites, with prospects further enhanced by the availability of gold at the same site.

BHP is also assessing the options for a potential $2.1 billion expansion of its Olympic Dam mine. This expansion would lift copper output from the facility by around 50 per cent to over 300,000 tonnes per year.

Although the long-term prospects for Olympic Dam remain strong, the mine has had some mixed results this year, with copper production disrupted in August by the failure of boiler tubes at its acid plant. This led to some further technical difficulties, which are expected to hinder production for around two months. BHP has reduced its production target for 2019 by 18 per cent, leaving the mine once again short of the 200,000 tonnes of copper that has long been viewed as its potential output.

Copper exports are expected to keep rising over the outlook period

Australia’s copper export earnings are expected to increase from $8.4 billion in 2017–18 to $10.9 billion in 2019–20 (Figure 12.9). Most of this is likely to be a volume effect reflecting the ramp-up at the Cadia Valley in NSW and Rocklands in Queensland.

Some price growth is also likely to boost exports values in 2019–20 and after, with earnings forecast to continue growing even after mine and export production level out.

Figure 12.9: Australia’s copper exports

![Graph](image-url)

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

Exploration expenditure is picking up, with broad growth across states

Exploration spending lifted from $59.8 million in the June quarter to $74.1 million in the September quarter 2018. This is the third successive quarter of rising expenditure, and comes amidst a period of increasingly tight global copper supply and rising demand.

Finance for copper exploration remains tight in Australia, however, with a lot of investment still directed to recycling existing deposits. Greenfields exploration has been impacted adversely in recent years by price volatility and poor sentiment among potential investors. This may change should prices lift further in the coming years.

Revisions to the outlook

Australia’s forecast copper export earnings for 2018–19 have been revised down by around $300 million as a result of falling prices.
### Table 12.1: Copper outlook

<table>
<thead>
<tr>
<th>World</th>
<th>Unit</th>
<th>2017</th>
<th>2018(^a)</th>
<th>2019(^f)</th>
<th>2020(^f)</th>
<th>2018(^a)</th>
<th>2019(^f)</th>
<th>2020(^f)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Production</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>–mine</td>
<td>kt</td>
<td>20,193</td>
<td>21,080</td>
<td>22,303</td>
<td>23,482</td>
<td>4.4</td>
<td>5.8</td>
<td>5.3</td>
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<tr>
<td>–refined</td>
<td>kt</td>
<td>23,522</td>
<td>24,008</td>
<td>24,651</td>
<td>25,240</td>
<td>2.1</td>
<td>2.7</td>
<td>2.4</td>
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<td><strong>Consumption</strong></td>
<td>kt</td>
<td>23,733</td>
<td>23,764</td>
<td>25,018</td>
<td>25,631</td>
<td>0.1</td>
<td>5.3</td>
<td>2.5</td>
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<td><strong>Closing stocks</strong></td>
<td>kt</td>
<td>1,063</td>
<td>878</td>
<td>608</td>
<td>447</td>
<td>–17.4</td>
<td>–30.8</td>
<td>–26.4</td>
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<tr>
<td>–weeks of consumption</td>
<td></td>
<td>2.3</td>
<td>1.9</td>
<td>1.3</td>
<td>0.9</td>
<td>–17.5</td>
<td>–34.3</td>
<td>–28.1</td>
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<tr>
<td><strong>Prices LME</strong></td>
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<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>–nominal</td>
<td>US$/t</td>
<td>6,164</td>
<td>6,430</td>
<td>6,434</td>
<td>8,013</td>
<td>4.3</td>
<td>0.1</td>
<td>24.5</td>
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<td></td>
<td>USc/lb</td>
<td>280</td>
<td>292</td>
<td>292</td>
<td>363</td>
<td>4.3</td>
<td>0.1</td>
<td>24.5</td>
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<tr>
<td>–real(^b)</td>
<td>US$/t</td>
<td>6,317</td>
<td>6,430</td>
<td>6,292</td>
<td>7,748</td>
<td>1.8</td>
<td>–2.1</td>
<td>23.1</td>
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<tr>
<td></td>
<td>USc/lb</td>
<td>287</td>
<td>292</td>
<td>285</td>
<td>351</td>
<td>1.8</td>
<td>–2.1</td>
<td>23.1</td>
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<tr>
<td><strong>Australia</strong></td>
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<tr>
<td>Mine output</td>
<td>kt</td>
<td>917</td>
<td>885</td>
<td>1,019</td>
<td>1,034</td>
<td>–3.5</td>
<td>15.1</td>
<td>1.5</td>
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<td>Refined output</td>
<td>kt</td>
<td>448</td>
<td>367</td>
<td>409</td>
<td>397</td>
<td>–18.0</td>
<td>11.3</td>
<td>–3.0</td>
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<tr>
<td><strong>Exports</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>–ores and cons.(^c)</td>
<td>kt</td>
<td>1,752</td>
<td>1,985</td>
<td>2,093</td>
<td>2,336</td>
<td>13.3</td>
<td>5.4</td>
<td>11.6</td>
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<tr>
<td>–refined</td>
<td>kt</td>
<td>413</td>
<td>317</td>
<td>383</td>
<td>364</td>
<td>–23.2</td>
<td>20.7</td>
<td>–5.0</td>
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<tr>
<td>–total metallic content</td>
<td>kt</td>
<td>920</td>
<td>892</td>
<td>979</td>
<td>1,030</td>
<td>–3.1</td>
<td>9.8</td>
<td>5.2</td>
</tr>
<tr>
<td><strong>Export value</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>–nominal</td>
<td>A$m</td>
<td>7,569</td>
<td>8,434</td>
<td>9,577</td>
<td>10,929</td>
<td>11.4</td>
<td>13.6</td>
<td>14.1</td>
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<td>–real(^d)</td>
<td>A$m</td>
<td>7,892</td>
<td>8,628</td>
<td>9,577</td>
<td>10,670</td>
<td>9.3</td>
<td>11.0</td>
<td>11.4</td>
</tr>
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</table>

Notes: \(^b\) In 2018 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; \(^s\) Estimate