Copper

Resources and Energy Quarterly June 2018

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

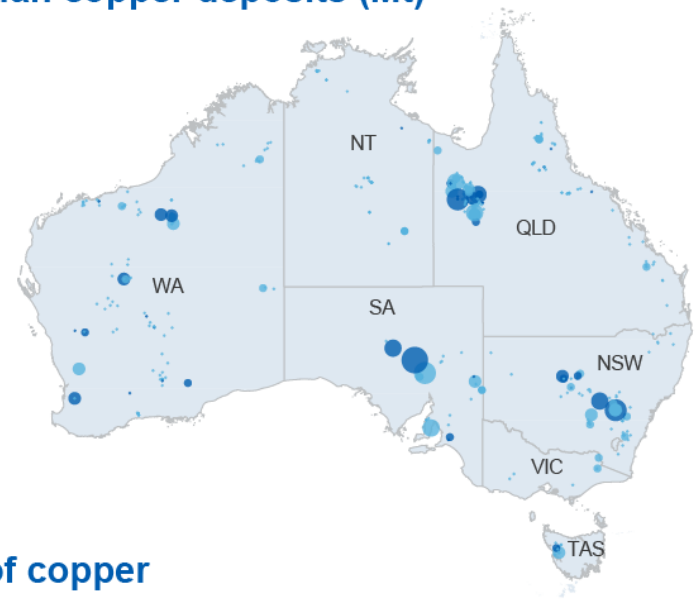
Australia is the **7th largest** producer of copper in the world

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

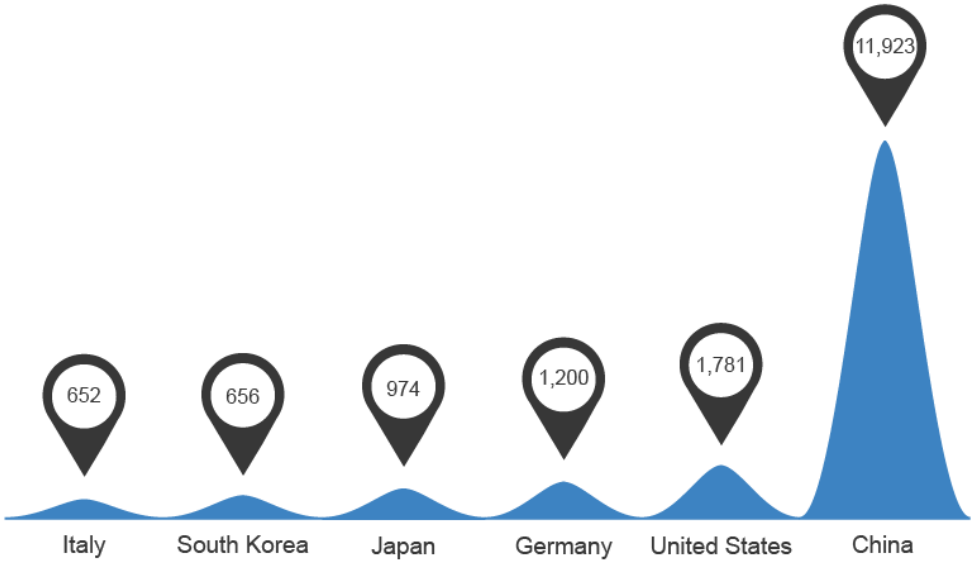
The average home contains **180 kg** of copper

Major Australian copper deposits (Mt)

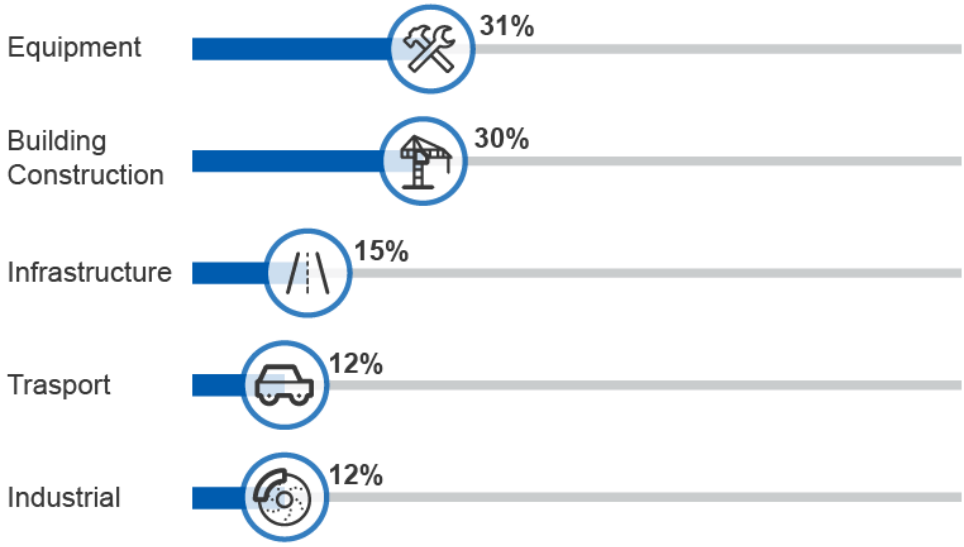
- <0.01
- 0.02
- 0.03–0.8
- 0.9–2.1
- 2.2–6.8
- >6.9
- Deposit
- Operating mine



Key copper consumer markets (thousand tonnes), 2017



Global uses of copper



12.1 Summary

- A rise in copper consumption is expected to push copper prices up from an average of US$6,462 in 2018, to US$7,910 a tonne by 2020.
- Australia's copper exports are forecast to rise from 897,000 tonnes in 2017–18 to over 1 million tonnes in 2019–20 (in metal content terms). This reflects an increase in production from several existing mines.
- The value of Australia's copper exports is projected to increase from $8.5 billion in 2017–18 to $11.5 billion by 2019–20. This reflects higher production in the short-term and price growth late in the outlook period.

12.2 Prices

Copper prices continued their recovery in early 2018

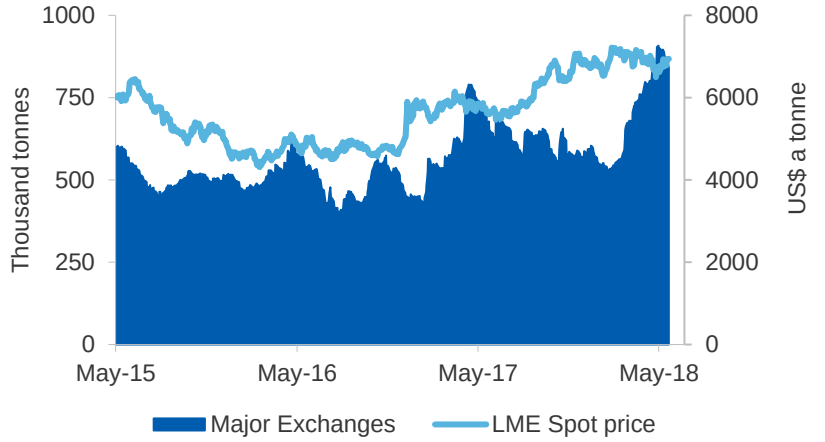
The London Metal Exchange (LME) copper price rose from US$6,808 in the December quarter to US$6,959 in the March quarter. This appears to lock in a price rise that began in the latter half of 2017, and which followed five years of declines. The rise reflects strong industrial production and growing demand for energy infrastructure and technology.

Copper prices are expected to taper in the short term

The LME copper price topped US$7,000 at points in February and remained at just under that level until May, when prices eased back slightly. Prices are likely to be constrained during 2018 by strong supply and a gradual slowing of economic growth in China.

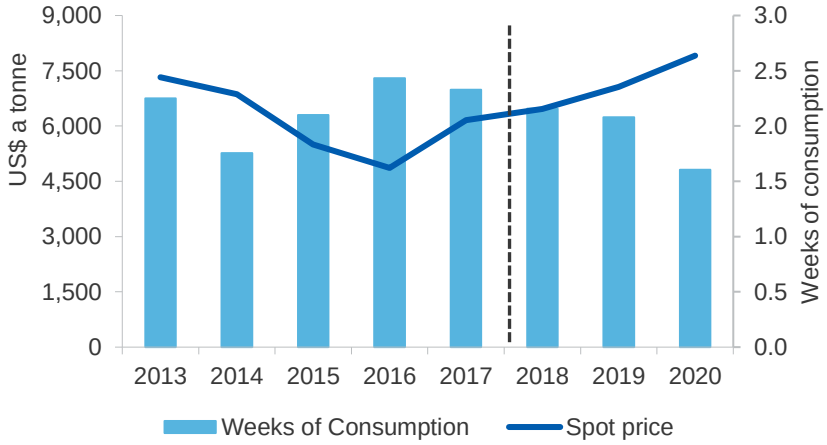
Although mined supply is expected to grow, recycled supply is likely to fall due to China's recent cuts in importation of scrap copper for recycling. Copper recycling can dial up and down rapidly, and it has often acted as a stabiliser for copper prices — adding to supply in high price environments, and reducing when prices are low. It is likely that other countries will replace China in the recycling market over time, but in the interim prices may lose a degree of stability. Potential supply shocks including industrial disruption from the Escondida mine in Chile also add to price uncertainty.

Figure 12.1: Copper prices and stocks on major exchanges



Source: LME (2018) official cash price; Bloomberg (2018) stock inventory at LME, COMEX and SHFE

Figure 12.2: Copper stocks versus price outlook



Source: LME (2018) official cash price; Department of Industry, Innovation and Science (2018)

On balance, it is expected that copper prices will yield some of their recent gains in the short-term as supply expands relative to demand. Prices are expected to average just under US$6,500 in 2018. However, rising industrial production — and growing use of copper in emerging fields such as renewable energy and electric vehicles — should support demand and push prices up again in 2019 and 2020.

12.3 World consumption

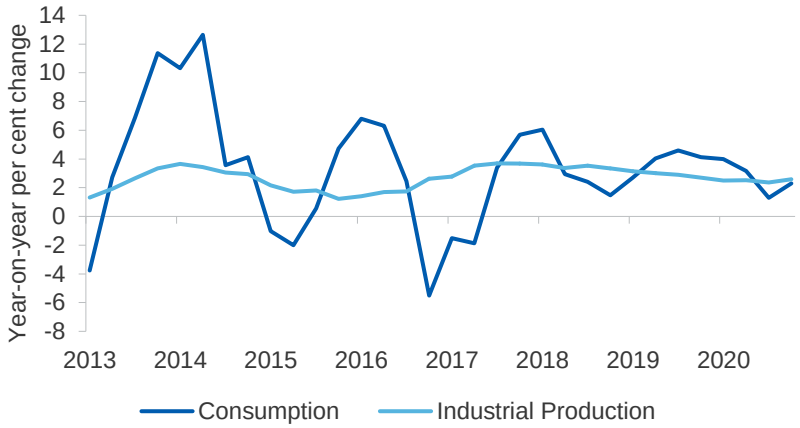
Copper consumption is set for solid growth over the next two years

Global copper consumption is projected to rise from 24.5 million tonnes in 2018, to 25.4 million tonnes in 2019 and 26.1 million tonnes in 2020, growing at an average rate of around 3 per cent a year. Higher copper consumption reflects growing global industrial production and a ramp-up in development of copper-intensive technologies and consumer items.

China — which consumes about half of all copper — remains critical to the copper outlook. However, its economic growth trajectory has become increasingly difficult to predict. China's growth is subject to several significant policy influences, including a policy-induced pivot towards 'higher quality' — or more environmentally sustainable — growth. This shift is playing out amidst a broader and longer-term transition towards a more consumer- and services-based economic model. Growth in Chinese power grid and fixed asset investment has been easing since 2016, with overall investment now beginning to decline in absolute terms. China's importance in the global copper market means even small changes in its economy have significant implications for copper consumption.

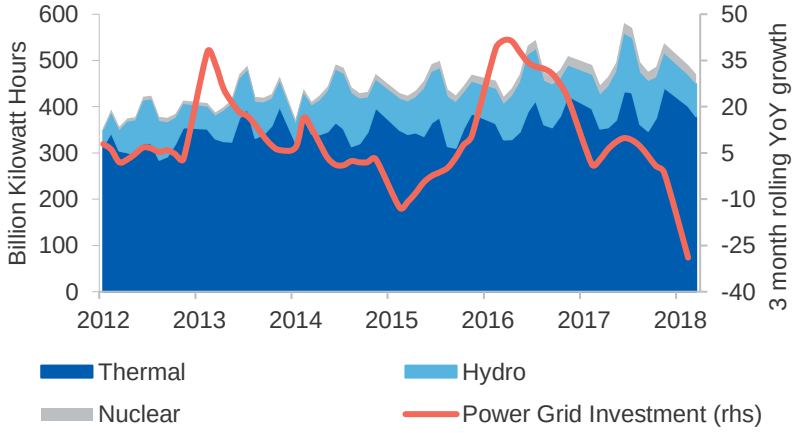
Some of the risk around China may be ameliorated by an expansion in copper use among other countries in Asia, as well as growing global demand for renewable energy and electric vehicles. Electric vehicles contain an average of 90 kilograms of copper — well above the 25 kilograms used on average in petrol vehicles. Output of electric vehicles is expected to increase by more than half over the next two years, resulting in 150,000 tonnes of extra copper demand globally by 2019.

Figure 12.3: World copper consumption and industrial production



Source: World Bureau of Metal Statistics (2018); Bloomberg (2018) Netherland CPB; Department of Industry, Innovation and Science (2018)

Figure 12.4: 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

Copper production in 2017 was temporarily constrained by disruptions to supply: export restrictions in Indonesia and industrial action in Chile affected several very large mines. These disruptions persisted into the March quarter 2018, which saw output edge just below 5 million tonnes.

World mine production is expected to recover rapidly

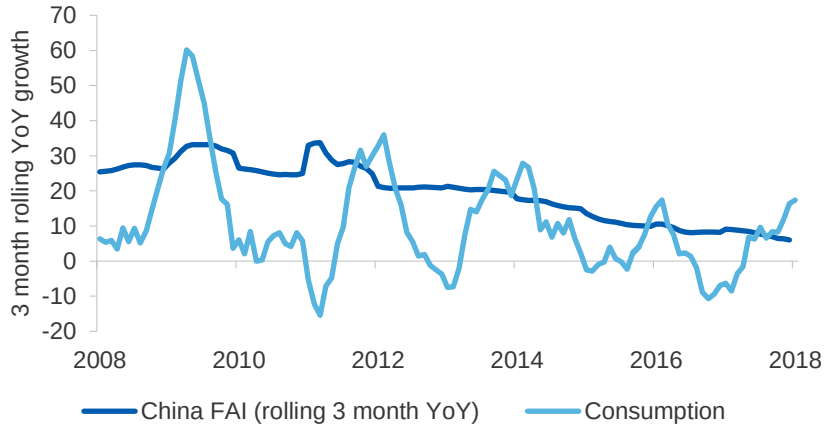
Global copper mine production is forecast to rise from 21.4 million tonnes in 2018 to 22.3 million tonnes in 2019, and then to 23.0 million tonnes in 2020. Major producers are expected to unveil a range of new mines and expansions, and disruptions are likely to wind down.

A total of 780,000 tonnes of new supply is expected to be added in 2018, as a result of expanded capacity from new projects. The bulk of this new capacity is expected to come from two key mines: First Quantum Minerals' Cobre Panama, with an estimated annual capacity of 330,000 tonnes, and the new Qulong copper mine in Tibet, operated by Tibet Julong Mining, which is expected to supply 120,000 tonnes.

Higher output will also be supported by a range of expansions to existing mines. These include two large upgrades in Chile and Peru, which are expected to add a total of 100,000 tonnes in new capacity. A further 190,000 tonnes of additional supply is expected from small upgrades across a range of producing countries. Partly offsetting this, refined supply from India is likely to be curtailed, after India's Tamil Nadu State announced that it would seek the closure of Vedanta's copper smelter in Thoothukudi. The smelter, which provides around 1.7 per cent of global supply, has long been a source of environmental protests.

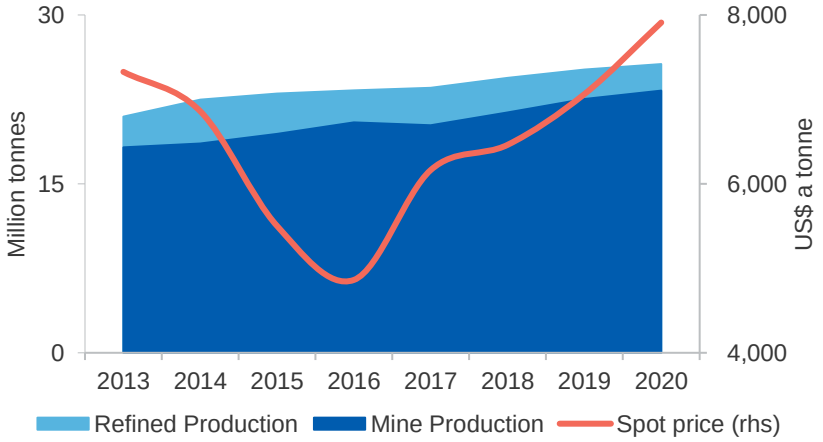
Global production is also subject to other significant risks. Among these are the prospects of renewed industrial action at the Escondida mine in Chile, which accounts for around 4.5 per cent of global production.

Figure 12.5: Chinese copper usage and Fixed Assets Investment



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

Figure 12.6: World copper production and prices



Source: World Bureau of Metal Statistics (2018); Department of Industry, Innovation and Science (2018)

A breakdown in contract renegotiations at the mine resulted in an output decline of more than 60 per cent in the March quarter 2017, and subsequent efforts to lock in an advance deal failed. However, contract renegotiations appear now to be moving in a positive direction, with the latest wage offer being provisionally accepted (although negotiations over working conditions remain ongoing).

Solid inventories for copper should provide some degree of cushioning against potential disruptions.

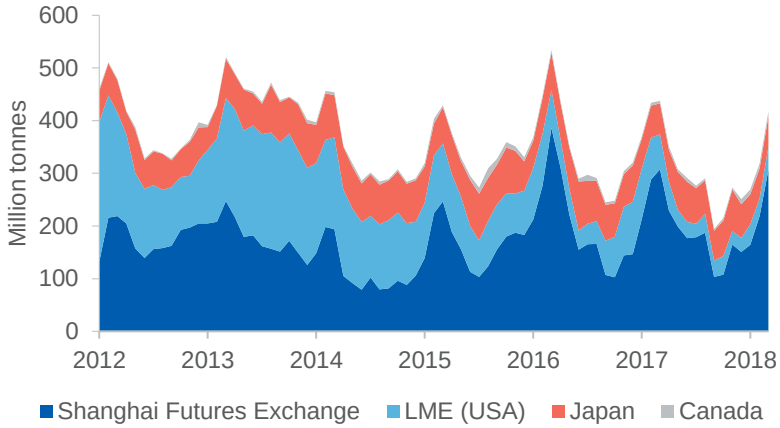
World refined copper output is expected to rise over the outlook period

World refined copper output is expected to grow from a record 24.4 million tonnes in 2018 to 25.0 million tonnes in 2019 and 25.5 million tonnes in 2020. Higher refined output will be driven by new refineries and expansion projects in China, supported by some growth in Europe and southern Asia.

Significant changes are underway in markets for secondary production. These markets supply around 4 million tonnes of copper from recycled sources each year. The changes are largely driven by China, which is the largest recycler of copper scrap. China cut its imports of copper scrap by almost 40 per cent in volume terms in the March quarter, following directives from its Ministry of Ecology and Environment which reflected a broader reform in China's waste management and recycling systems, and led to the immediate banning of low grade scrap imports. Supply of recycled copper will likely be suppressed over the outlook period, but ultimately a diversion of imports to nearby countries such as Thailand and the Philippines should see normal supply resume.

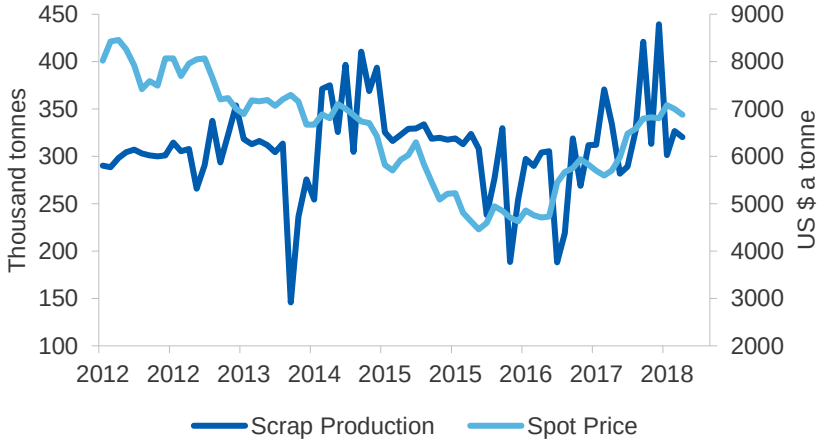
Accordingly, production of recycled copper is forecast to ease from 4.0 million tonnes in 2017 to 3.8 million tonnes by 2019, and then rebound to 4.3 million tonnes by 2020. Over the longer term, supply from recycled sources is expected to rise as countries expand their recycling operations. Greater quantities of copper are likely to return to markets over time as growing numbers of electronic consumer goods reach end of life, and are scrapped.

Figure 12.7: Copper stocks by location



Source: AME (2018) Strategic Study 4Q 2017; Department of Industry, Innovation and Science (2018)

Figure 12.8: Secondary copper production and price



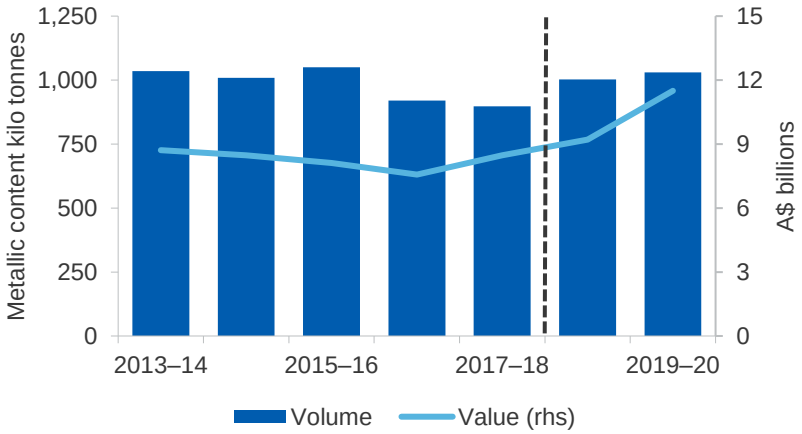
Source: Bloomberg Statistics (2018); Department of Industry, Innovation and Science (2018)

12.5 Australia

Copper exports are expected to keep rising over the outlook period

Australia's copper export earnings are estimated to have lifted by 11.9 per cent to $8.5 billion in 2017–18. This is partly due to higher prices and partly a result of larger output from South Australia, where REX Minerals' new Hillside mine is expected to commence in the near future. The recommencement of full operations following upgrades at Olympic Dam has also supported a rise in exports in the second half of the year. Most growth in Australian exports in recent years has been in ore and concentrates, which supply China's growing refinery capacity.

Figure 12.9: Australia's copper exports



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

The value of Australia's copper export earnings is projected to increase from $8.5 billion in 2017–18 to $9.2 billion in 2018–19, with an even sharper rise (to $11.5 billion) projected for 2019–20. This is largely a result of an expected rise in copper prices and expanded output (or a return to normal output) at several significant mines towards the end of the outlook period.

These include Newcrest's sizeable Cadia Valley mine, which is expected to ramp up its production significantly in 2019 following a prolonged slowdown, which began in 2017 due to seismic activity. Other mines returning to normal production include CuDeco's Rocklands mine in Queensland, which was temporarily suspended amidst safety concerns, and Sterlite Industries Mount Lyell mine, which is returning from a temporary period of care and maintenance, in early 2019.

Mine production will be supported by rising output from existing mines

Australian production is projected to rise from 898,000 tonnes in 2017–18 to just over 1 million tonnes in 2019 and 2020. This is largely a result of a return to normal production among existing mines at Cadia Valley, Mount Lyell and Rocklands, though Oz Minerals may also open a new mine in Carrapateena in 2020.

Although short-term prospects for new production sources are modest, eleven copper projects remain in the investment pipeline, and the expected growth in world prices should significantly improve the prospects for some of these projects over the longer term.

Exploration expenditure is gradually rising

Exploration spending lifted marginally, from $42.4 million in the December quarter to $46.2 million in the March quarter 2018. The lift was a result of higher exploration activity in NSW and South Australia.

Exploration appears to be recovering gradually, after falling by around 75 per cent from its 2011–12 peak (when exploration averaged more than $110 million per quarter).

Table 12.2: Copper outlook

World	Unit	2017	2018[s]	2019[f]	2020[f]	Annual percentage change 2018[s]	2019[f]	2020[f]
Production								
–mine	kt	20,193	21,351	22,310	23,049	5.7	4.5	3.3
–refined	kt	23,522	24,412	25,027	25,511	3.8	2.5	1.9
Consumption	kt	23,733	24,488	25,436	26,118	3.2	3.9	2.7
Closing stocks	kt	1,063	1,016	1,018	805	–4.4	0.2	–20.9
–weeks of consumption		2.3	2.2	2.1	1.6	–7.4	–3.6	–22.9
Prices LME								
–nominal	US$/t	6,164	6,462	7,063	7,910	4.8	9.3	12.0
	USc/lb	280	293	320	359	4.8	9.3	12.0
–real[b]	US$/t	6,310	6,462	6,913	7,598	2.4	7.0	9.9
	USc/lb	286	293	314	345	2.4	7.0	9.9
Australia	**Unit**	**2016–17**	**2017–18[s]**	**2018–19[f]**	**2019–20[f]**	**2017–18[s]**	**2018–19[f]**	**2019–20[f]**
Mine output	kt	917	898	1,019	1,034	–2.1	13.5	1.5
Refined output	kt	448	367	409	397	–18.0	11.3	–3.0
Exports								
–ores and cons.[c]	kt	1,752	1,938	2,200	2,336	10.6	13.5	6.2
–refined	kt	413	333	375	364	–19.5	12.7	–2.9
–total metallic content	kt	920	897	1 003	1 030	–2.5	11.7	2.7
Export value								
–nominal	A$m	7,569	8,467	9,214	11,498	11.9	8.8	24.8
–real[d]	A$m	7,717	8,467	9,003	10,976	9.7	6.3	21.9

Notes: b In 2018 calendar year US dollars; c Quantities refer to gross weight of all ores and concentrate s; d In 2017–18 financial year Australian dollars; **f** Forecast; **s** Estimate

Source: ABS (2018) International Trade, 5465.0; LME (2018) spot price; World Bureau of Metal Statistics (2018) World Metal Statistics; Department of Industry, Innovation and Science (2018)