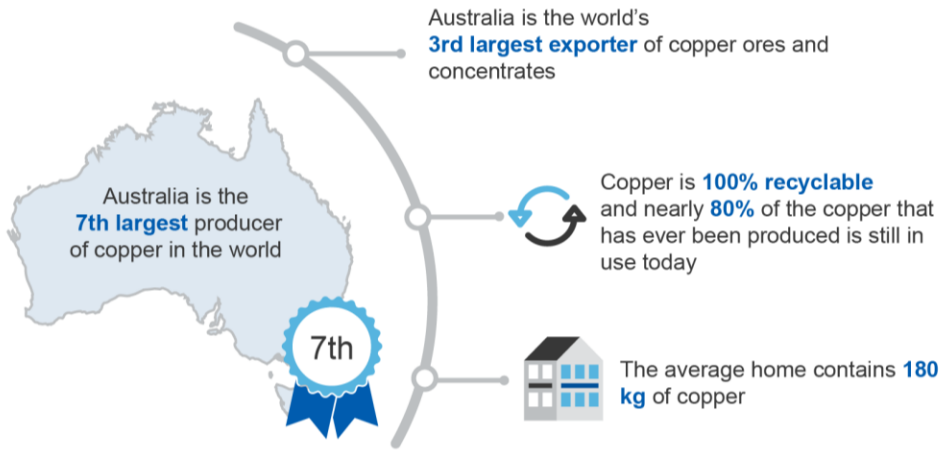
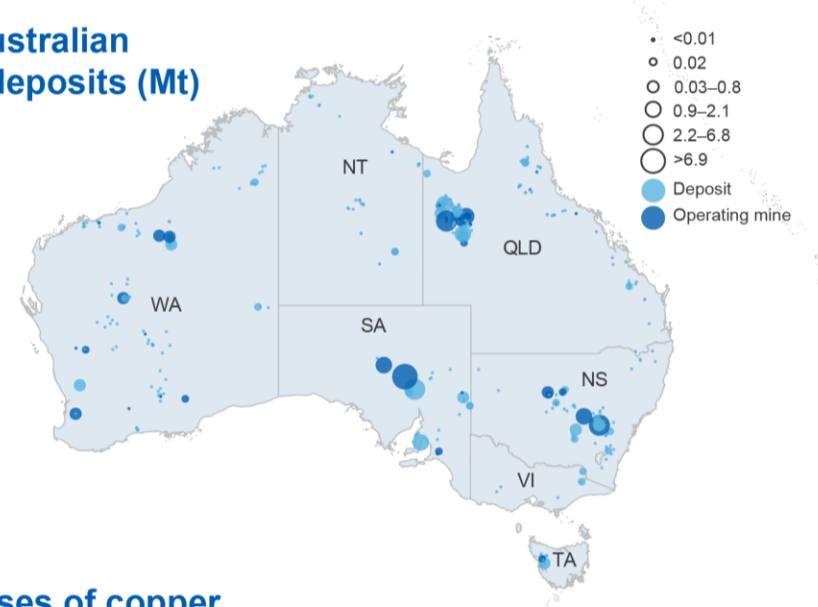


Copper

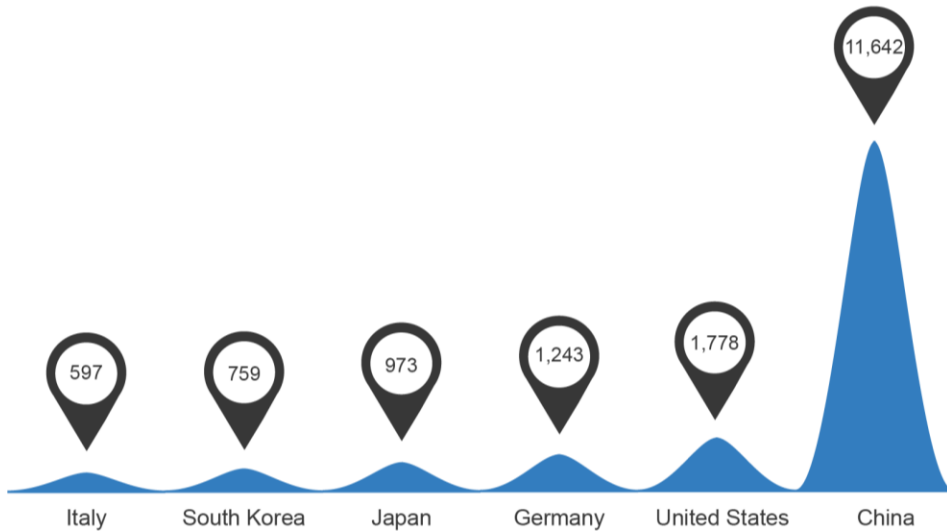
Resources and Energy Quarterly June 2017



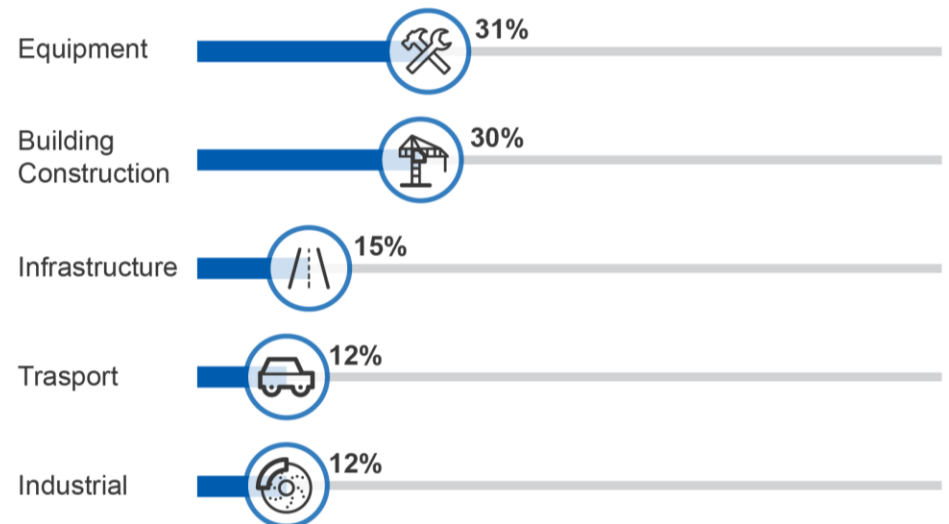
Major Australian copper deposits (Mt)



Key copper consumer markets (thousand tonnes)



Global uses of copper



Market summary

After rising in the March quarter, world copper prices declined in the June quarter 2017, weighed down by declining demand and higher inventories. Disruptions at a number of major mines in the March quarter were largely offset by new mine supply and expansion projects coming online. Australian production was steady in the March quarter, despite weather-related disruptions impacting several operations. Australia's copper exports decreased by 18 per cent year-on-year in the March quarter, led by lower exports to Asian destinations. Copper export earnings are forecast to increase by 8.4 per cent in 2017–18 to \$8.0 billion, supported by higher prices and volumes.

Prices

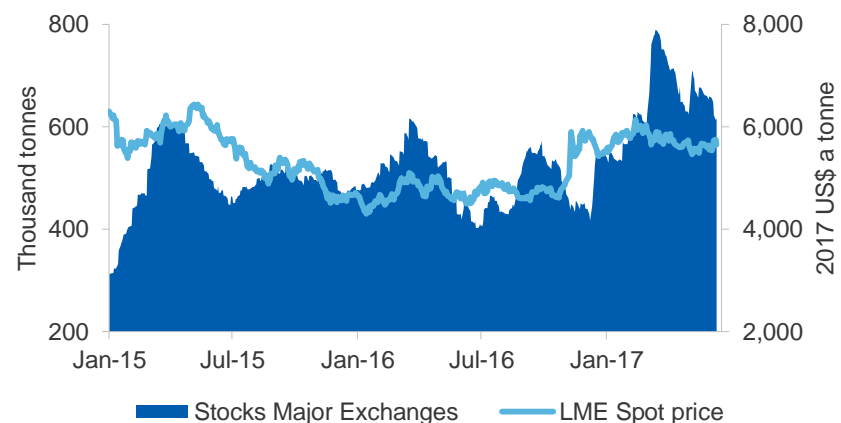
Copper prices drift lower in the June quarter

The London Metal Exchange (LME) spot copper price declined in the June quarter, reaching a low of \$5,466 on 8th May. Copper prices have been weighed down by weaker consumption and relatively high inventories. Copper stocks on the major exchanges reached a three-year high in March, and have since remained elevated despite supply disruptions at three of the world's largest mines.

The LME copper spot price is forecast to average US\$5,667 per tonne in 2017, up by 17 per cent from 2016. This represents a downward revision from March 2017 *Resources and Energy Quarterly*, reflecting a larger than expected market surplus. The larger surplus derives from slightly lower expectations for demand from China and the US — the world's two largest copper users. Copper prices are forecast to decline by 4.1 per cent in 2018 to US\$5,438 per tonne, weighed down by both strong growth in mine supply and slightly lower expectations for global demand.

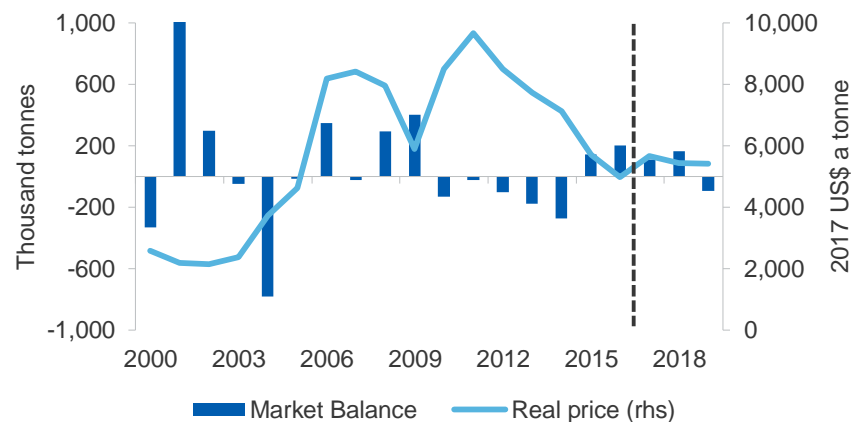
There are several risks to the outlook for copper prices in the near term. Industrial action by mine workers, and government intervention on trade and mine operations, could introduce further supply disruptions in the second half of 2017. On the other hand, weaker than expected economic growth in China may have a dampening effect on prices. A strong appreciation of the US dollar remains a key risk to the outlook. A rising US dollar makes copper more expensive for non-US residents, and thus tends to have a dampening effect on consumption.

Figure 12.1: Copper prices and stocks on major exchanges



Source: LME (2017) official cash price; Bloomberg (2017) stock inventory at LME, COMEX and SHFE

Figure 12.2: Copper price and market balance



Source: World Bureau of Metal Statistics (2017); Department of Industry, Innovation and Science (2017)

World consumption

Copper consumption weighed down by key markets

World refined copper consumption decreased by 3.6 per cent year-on-year in the first four months of 2017, to 7.5 million tonnes. Consumption was weighed down by weaker demand from China and Europe. However, several nations' consumption grew significantly, such as South Korea, Taiwan and Brazil. Due to the larger than expected decline in consumption in the first four months, the forecast for global copper consumption in 2017 has been revised down to 23 million tonnes.

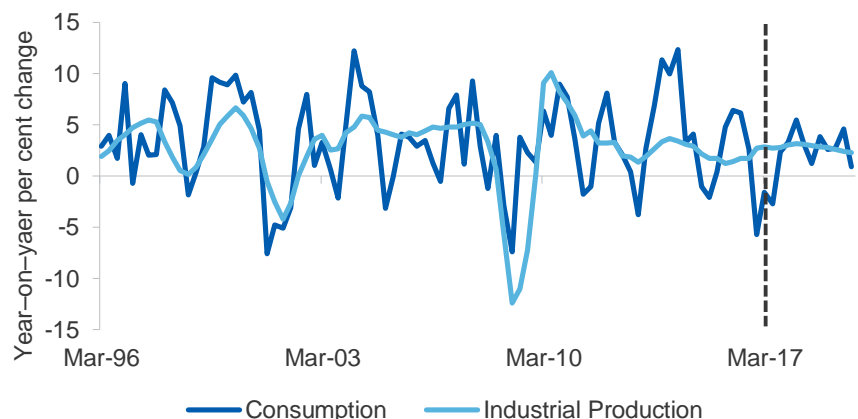
Copper consumption in China declined by 7.7 per cent year-on-year in the first four months, to 3.7 million tonnes. Commercial 'floor-space started' — a leading indicator for China's construction sector — increased by 3.1 per cent year-on-year in the first five months of 2017. China's capital investment in the power grid construction increased by 5.5 per cent year-on-year in the first five months of 2017. The pace of investment growth is much lower than at the start of 2016, however, copper demand is expected to rise in 2017, as the power grid is expanded to keep pace with rising electricity demand.

China's imports of refined copper fell 28 per cent year-on-year over the first five months of 2017. However, imports of copper ores and concentrates and scrap copper have risen. Ore and concentrate imports rose by 1.9 per cent over the same period, reflecting a structural trend towards refining copper ores in China, instead of importing refined metal. Scrap copper imports rose by 18 per cent in January-May 2017.

Copper consumption in the US declined by 1.7 per cent year-on-year in the first four months of 2017. The construction sector remains the strongest source of growth for copper demand in the US. New housing permits increased by 8.3 per cent year-on-year in the first five months, pointing to stronger demand for copper in 2017. The US manufacturing sector started the year weaker, with production of electrical equipment flat, and vehicle production falling by 3.2 per cent year-on-year in the first five months of 2017.

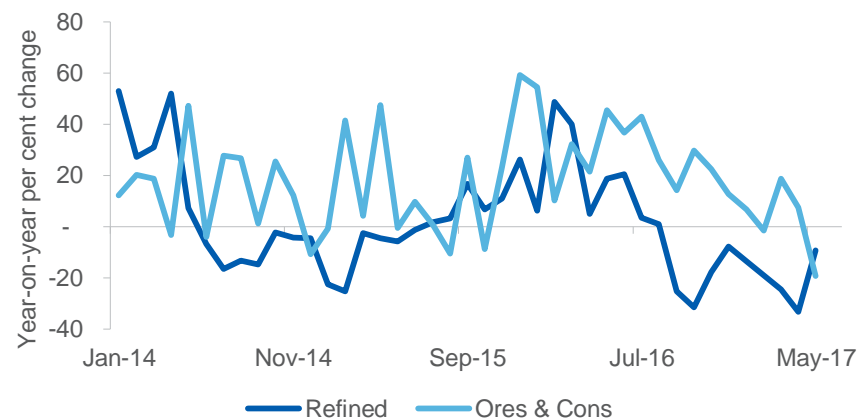
Growth in global investment in infrastructure and urbanisation in Emerging economies is expected to drive much of the growth in copper consumption over the next two years. Copper consumption is forecast to increase by 3.4 per cent in 2018 to 24 million tonnes, and rise by a further 2.7 per cent in 2019, to 25 million tonnes.

Figure 12.3: World Copper Consumption and Industrial Production



Source: World Bureau of Metal Statistics (2017); Bloomberg (2017) Netherland CPB; Department of Industry, Innovation and Science (2017)

Figure 12.4: Growth in China's copper imports



Source: Bloomberg (2017) General Administration of Customs, China

World production

World mine copper production remains historically high

World mine copper production decreased by 0.6 per cent year-on-year in the first four months of 2017. The year-on-year decrease was weighed down by supply disruptions at three of the world's largest mines, and by lower than expected production elsewhere. The forecast for world mine production in 2017 has been revised down to 20 million tonnes.

Chile, Canada and the United States all had lower production year-on-year in the March quarter. Output at the world's largest copper mine, Escondida in Chile, declined by 64 per cent year-on-year to 94,900 tonnes. The decline was due to strike action, which interrupted production for almost two months. In Peru, the ramp-up in production at Las Bambas continues; the mine produced over 111,000 tonnes in the March quarter.

An additional 430,000 tonnes of copper from new mines and expansions is expected to come online in 2017. Of this figure, over half is from sources which are currently producing. Aktogay in Kazakhstan — operated by KAZ Minerals — is expected to produce 95,000 tonnes, making it the largest contributor to new mine supply in 2017.

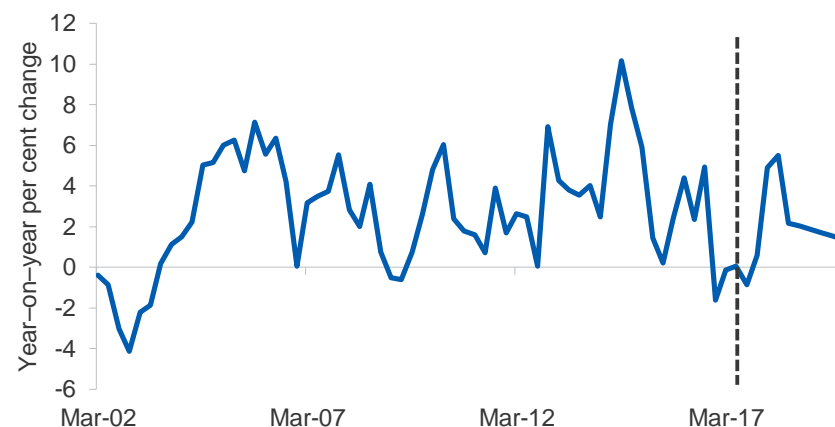
Several large-scale mines and expansions are expected to achieve commercial production in 2018. By far the largest contribution will come from Cobre Panama, operated by First Quantum Minerals. The mine has an estimated annual capacity of 330,000 tonnes. Qulong, a new copper project operated by Tibet Julong Mining, is expected to produce 120,000 tonnes annually from 2018. Two notable expansion projects, Codelco's Radomiro in Chile and Southern Copper's Toquepala in Peru, are both expected to contribute an additional 100,000 tonnes each in 2018.

As further new mines commence production and others expand, copper mine production is forecast to rise by 3.8 per cent in 2018 to 21 million tonnes, and to rise by 1.6 per cent in 2019 to 22 million tonnes.

Slow start for world refined copper production

World refined copper production decreased by 0.6 per cent year-on-year in the first four months of 2017 to 7.7 million tonnes. Refined copper output was weighed down by mine disruptions that impacted on the supply of copper ores and concentrates.

Figure 12.5: World Copper Refined Production



Source: World Bureau of Metal Statistics (2017); Department of Industry, Innovation and Science (2017)

Refined copper output is forecast to reach 24 million tonnes in 2017, which is similar to last year.

An additional 648,000 tonnes of refining capacity are expected to come online in 2017. Most of the new refining capacity will be in China, where five projects are expected to contribute an additional 585,000 tonnes of refining capacity. The expansion in China's refinery production is expected to continue in 2018, with an additional six projects providing a combined output of 570,000 tonnes.

Refined production is forecast to increase by 3.6 per cent in 2018, to 24 million tonnes, leading to a market surplus of 164,000 tonnes.

In 2019, relatively stronger consumption growth is forecast to outweigh an increase in refined production (up by 1.6 per cent to 25 million tonnes), in line with rising world mine supply. As a result, the market balance is expected to tighten in 2019, to show a 94,000 tonne deficit.

Australia's production and exports

Exploration expenditure declines in March Quarter

Australia's copper exploration expenditure decreased by 27 per cent year-on-year in the March quarter 2017, to \$27 million — the lowest first quarter result since 2009. Copper exploration expenditure has been in steady decline since 2012, weighed down by falling world prices. The decline in March was impacted by exceptional wet weather. Exploration in Western Australia declined by 46 per cent year-on-year in the March quarter, mostly due to heavy rainfall in January. Exploration expenditure in Queensland declined by 26 per cent year-on-year, as Cyclone Debbie impacted drilling operations. Few weather-related events were recorded in South Australia, where expenditure increased by 20 per cent year-on-year, to \$3.6 million. Expenditure is expected to rise in 2017, as higher prices encourage new exploration.

Production was steady in the March quarter

Australia produced 237,200 tonnes of copper ores and concentrates in the March quarter, virtually unchanged from March 2016. Australia's mine production of copper is estimated to have reached 944,800 tonnes in 2016-17.

Despite the impact of Cyclone Debbie and a train derailment, Queensland copper production increased by 20 per cent year-on-year in March quarter. Production at Oz Minerals' Prominent Hill operations in South Australia was impacted by heavy rainfall in the March quarter. Despite the rain, Oz Minerals still expects to reach annual production of over 105,000 tonnes in 2017, as production ramps up in the September quarter.

Mount Lyell — operated by Vedanta's Copper Mines of Tasmania — may restart in late 2018, after the Tasmanian Government announced a further \$9.5 million in funding to support the mine's reopening. Mount Lyell has been on care and maintenance since 2014, due to the tragic death of three workers.

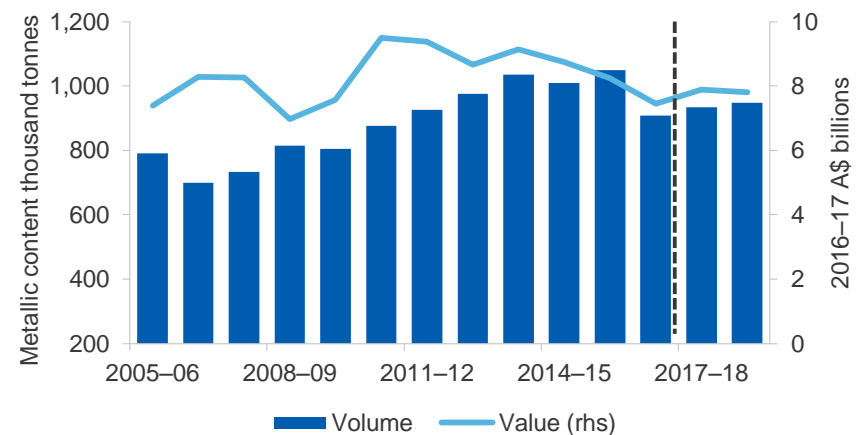
Australian production is forecast to increase by 4.6 per cent in 2017–18, to 988,700 tonnes. Production at Olympic Dam is expected to rise over the outlook period, as zones of higher grade ore are mined. With the recommissioning of Mount Lyell expected to add an additional 30,000 tonnes, Australian production is forecast to increase by 0.4 per cent in 2018–19, to 992,600 tonnes.

Refined copper exports declined in the March quarter

Australia's copper export earnings declined by 13 per cent year-on-year in the March quarter, to \$975 million. The decline was due to lower export volumes of both copper ores and concentrates, as well as refined copper, which fell by 26 per cent year-on-year. Higher exports of copper ores and concentrates to Japan (up by 21 per cent year-on-year to 125,000 tonnes) and China (up by 15 per cent over the same period to 204,000 tonnes), were offset by lower export volumes of copper ores and concentrates to India, South Korea and the Philippines.

Australia's copper exports (in metal-content terms) are forecast to increase by 2.7 per cent in 2017–18, to 933,000 tonnes, with a value of \$8.1 billion (in real terms). Copper exports remain supported by historically high consumption in China, which accounts for 47 per cent of Australia's copper exports. Australia's copper exports are forecast to increase by 1.6 per cent to 948,000 tonnes in 2018–19, valued at \$7.8 billion (in real terms).

Figure 12.6: Australian copper export volume and values



Source: ABS (2017) *International Trade*, 5465.0; Department of Industry, Innovation and Science (2017)

Table 12.1 Copper outlook

World	Unit	2016	2017 f	2018 f	2019 f	Annual percentage change		
						2017 f	2018 f	2019 f
Production								
– mine	kt	20,753	20,407	21,184	21,531	-1.7	3.8	1.6
– refined	kt	23,530	23,509	24,361	24,761	-0.1	3.6	1.6
Consumption	kt	23,331	23,402	24,197	24,855	0.3	3.4	2.7
Closing stocks	kt	1 095	1 203	1 367	1 273	9.8	13.6	-6.9
– weeks of consumption		2.4	2.7	2.9	2.7	9.5	9.9	-9.3
Price LME								
– nominal	US\$/t	4,863	5,667	5,568	5,672	16.5	-1.7	1.9
	USc/lb	221	257	253	257	16.5	-1.7	1.9
– real b	US\$/t	4,972	5,667	5,438	5,415	14.0	-4.0	-0.4
	USc/lb	226	257	247	246	14.0	-4.0	-0.4
Australia	Unit	2015–16	2016–17 s	2017–18 f	2018–19 f	2016–17 s	2017–18 f	2018–19 f
Mine production	kt	990	945	989	993	-4.5	4.6	0.4
Refined production	kt	514	465	480	478	-9.5	3.2	-0.3
Export volume								
– ores and conc. c	kt	1,870	1,695	1,755	1,817	-9.4	3.5	3.5
– refined	kt	507	411	421	419	-18.9	2.4	-0.3
– total metallic content	kt	1,050	909	933	948	-13.4	2.7	1.6
Export value								
– nominal	A\$m	8,110	7,439	8,062	8,148	-8.3	8.4	1.1
– real d	A\$m	8,252	7,439	7,892	7,804	-9.9	6.1	-1.1

Notes: **b** In 2017 calendar year US dollars; **c** Quantities refer to gross weight of all ores and concentrates; **d** In 2016–17 financial year Australian dollars; **f** Forecast; **s** estimate.

Source: ABS (2017) International Trade, 5465.0; LME (2017) spot price; World Bureau of Metal Statistics (2017) World Metal Statistics; Department of Industry, Innovation and Science (2017).