Zinc

Resources and Energy Quarterly September 2017

843,000 tonnes
of zinc were mined in Australia in 2016–17

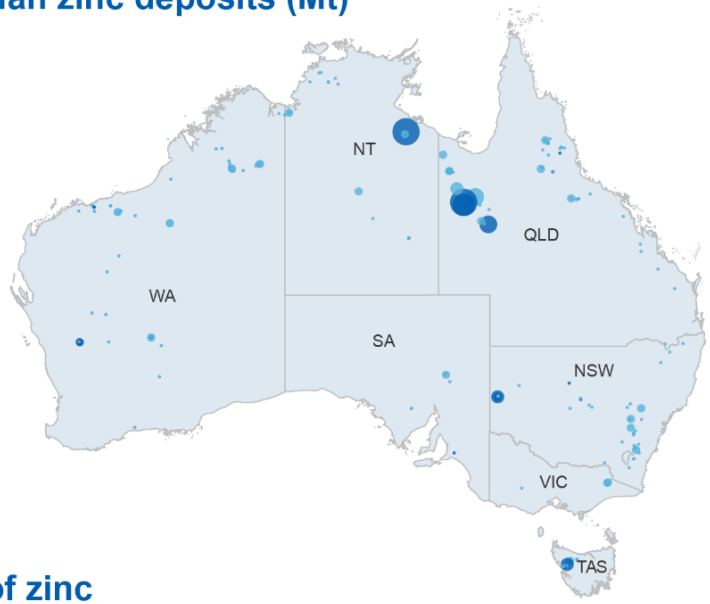
Zinc exports will earn
$2.7 billion
for Australia in 2016–17

Australia is the
3rd highest
producer of zinc
in the world

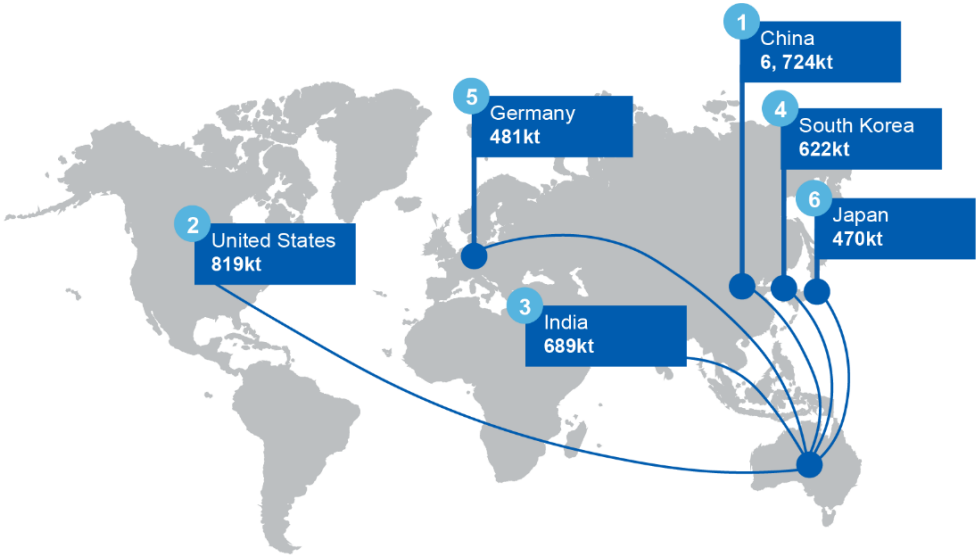
Australia holds
20%
of the worlds
known zinc
resources

Major Australian zinc deposits (Mt)

- <0.01
- 0.02–0.03
- 0.04–0.09
- 0.10–0.20
- 0.21–0.44
- >0.45
- Deposit
- Operating mine



Key zinc consumer markets



Global uses of zinc

50%
galvanise steel

17%
diecasting

17%
make brass and
bronze alloys

6%
rolled zinc

6%
chemicals

4%
other

Summary

- Market fundamentals continue to strengthen for zinc producers, with the price lifting to 10-year highs over the past 12 months.
- Export earnings are forecast to decline slightly to $2.66 billion in 2017–18, due to falls in zinc production. A recovery in Australian production is expected to lift zinc exports to $2.83 billion in 2018–19.
- Australia's ability to capitalise on high prices has been hampered by mine closures over the past two years. Exports of zinc (metallic content) are expected to bottom out at 959,000 tonnes in 2017–18, before recovering to 1,118,000 tonnes in 2018–19, as three new mines commence operation.

Prices and stocks

Zinc prices have lifted strongly due to supply constraints

The LME zinc price is forecast to average $US2,800 per tonne in 2017 — 34 per cent higher than the average for 2016. The price reached 10-year highs during August and September, rising above $3,100 a tonne, with potential to rise further before the end of the year. This follows an announcement of lower-than-expected Chinese production in July. Repeated price spikes reflect acute shortages in global production, which have led to inventory drawdowns and relatively low global stocks.

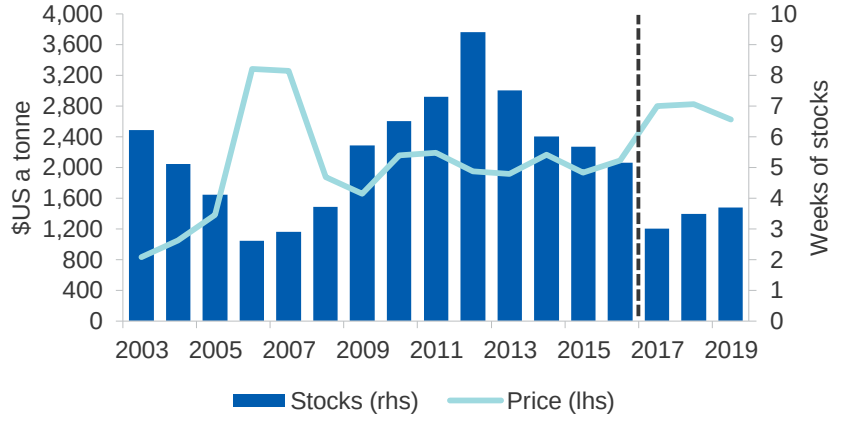
Prices regularly fell below $US2,000 a tonne during 2015 and 2016; however, no return to this price level is expected in the foreseeable future. Although efforts are being made to expand production in a number of countries, consumption growth is also rising rapidly. Infrastructure development and growing use of automobiles in China and India are creating huge new markets for zinc, which will lift the base price to a higher floor. Increased production in China and elsewhere should help to stabilise prices at around $2,820 per tonne in 2018, and then bring prices down slightly to $US2,625 per tonne in 2019.

Some risks to the outlook are evident: infrastructure spending in the United States may not materialise, or may occur at a slower rate than planned. The Chinese Government may also prioritise increased production on a scale which significantly increases global supply. However given present market fundamentals , even substantial change on those fronts is unlikely to bring prices down sharply.

Figure 14.1: Zinc monthly price

Source: LME (2017) zinc spot price

Figure 14.2: Annual zinc spot price and weeks of stocks



Source: LME (2017) zinc price; Department of Industry, Innovation and Science (2017)

World consumption

Automobile and infrastructure sectors are the key to consumption growth

World refined zinc consumption is expected to rise by 3.3 per cent to 14.4 million tonnes in 2017. China, which consumes around half of the world's refined zinc, is expected to continue driving demand, through ongoing public sector investment. There is also a potential for higher zinc demand in the US, as a result of healthy manufacturing activity and the potential for substantial new government infrastructure investment. Global consumption is forecast to rise by 3.4 per cent to 14.9 million tonnes in 2018 and by 3.6 per cent to 15.4 million tonnes in 2019. Inventories are expected to remain under pressure, though a ramp up in supply should allow some inventory rebuild by 2019.

Rising incomes in China and India, and falling fuel prices, are creating the conditions for rising car ownership. And there is substantial potential for car ownership to rise: per capita car ownership in the US is four times higher than in China, and twenty times higher than in India.

Concerns over air pollution — which causes nearly 3 million premature deaths each year across China and India — will muddy the outlook for zinc. On the automotive front, air pollution concerns are likely to lead to a push for fuel efficiency, which will support a shift from steel-made cars to lighter aluminium-based models. This will reduce the per-unit use of zinc in automobile construction.

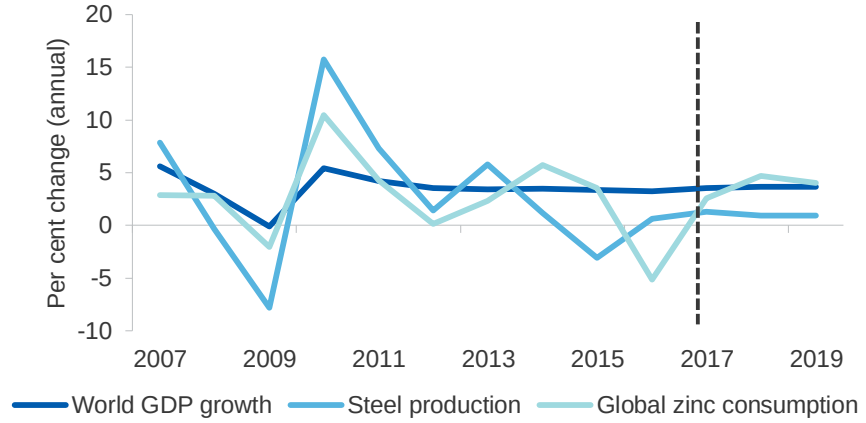
However, efforts to reduce urban pollution are also driving substantial investment in mass transit systems in China and India, which will create substantial new demand for zinc. Zinc is essential for steel, and also plays a role in improving corrosion resistance in train carriage bodies and rails. In India, corrosion currently reduces the life of rail by half, creating significant disruption and extra costs. Governments in India and China have committed more than $US200 billion towards new investment in rail networks over the next five years.

World production

World mined production is expected to pick up

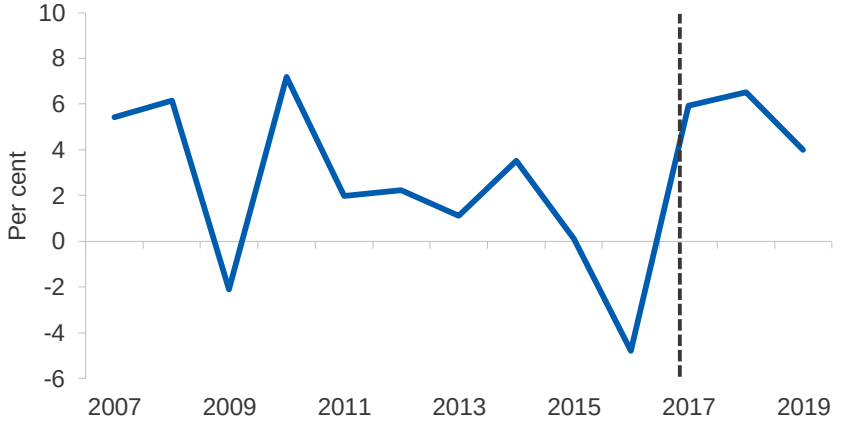
Zinc mine production is expected to lift by 6 per cent to 13.6 million tonnes in 2017. Global production will be supported by strong growth (of around 8 per cent) in Chinese output. Indian output is also expected to lift, following Hindustan Zinc's successful transition to underground

Figure 14.3: Annual change in global GDP, steelmaking and zinc use



Source: IMF (2017), Department of Industry, Innovation and Science estimates

Figure 14.4: Global mined zinc production (annual change)



Source: IMF (2017), Department of Industry, Innovation and Science estimates

operations at its Rampura Agucha mine. Output at the large Antamina mine in Peru also appears set to exceed expectations for the year.

Investment in new and expanded capacity in China is expected to drive further increases in supply, to 14.5 million tonnes in 2018 and 15.1 million tonnes in 2019. Stocks are expected to remain tight, though pressures may ease somewhat in 2019 as new supply builds.

Refined production is constrained, but the outlook is improving

For several years, refined production has been affected by mine closures and the suspension of smelter operations. Production is expected to edge down to 13.8 million tonnes in 2017, affected by strikes in Canada and floods in Peru. However, the impacts of these disruptions are already passing, and significant new capacity in China is expected to come online in 2018. Indian output is also expected to rise, supported by the improving availability of concentrates in its domestic market. These factors should help support a rise in production — by 6.3 per cent to 14.7 million tonnes in 2018 and a further 4.1 per cent to 15.3 million tonnes in 2019.

Australia's exploration, production and exports

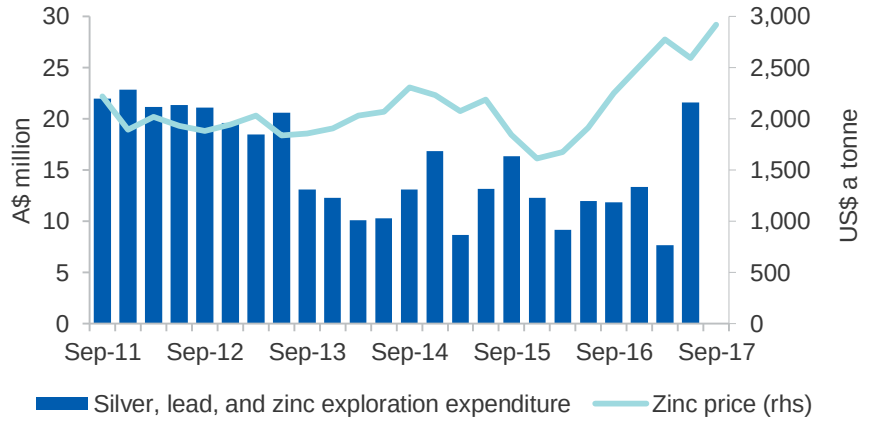
Higher prices have led to a strong rebound in exploration expenditure

Australia's expenditure on zinc, lead and silver exploration rebounded in the June quarter, after several quarters of decline. Expenditure almost tripled in the June quarter, rising to $21.6 million from $7.7 million in the March quarter. Strong zinc prices are the likely cause of this renewed interest among resource companies. Expenditure picked up most notably in the north and west of Queensland.

Australian mined production is forecast to decrease

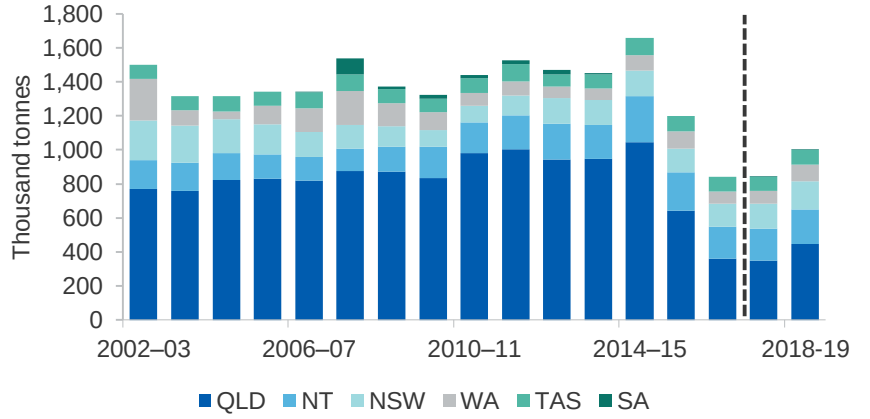
Australia's mined zinc production is expected to be stable in 2017–18, edging up from 843,000 tonnes to 846,000 tonnes. Production is expected to rise much more strongly in 2018–19 to 1,003,000 tonnes. This will be driven, in large part, by the commencement of MMG's Dugald River mine, which is expected to become one of the ten largest zinc mines in the world. KBL's Sorby Hills mine and Heron Resources' Woodlawn mine are also expected to commence operations in 2018–19, with Independence Group's Stockman operation following in the second half of 2019.

Figure 14.5: Australia's silver, lead & zinc exploration expenditure



Source: ABS (2017) Mineral and Petroleum Exploration, cat. no. 8412.0; LME (2017)

Figure 14.6: Australia's mine production by state



Source: Company reports; Department of Industry, Innovation and Science (2017)

Australia's refined production is set to increase marginally

Australia's refined production increased by 7 per cent to 466,000 tonnes in 2016–17, supported by increased production at Sun Metals' Townsville smelter in the first half of the year. A further small increase to around 500,000 tonnes is expected in 2017–18, supported by additional mined production from Dugald Diver and Sorby Hills. Refined production is expected to remain at around 500,000 tonnes in 2018–19.

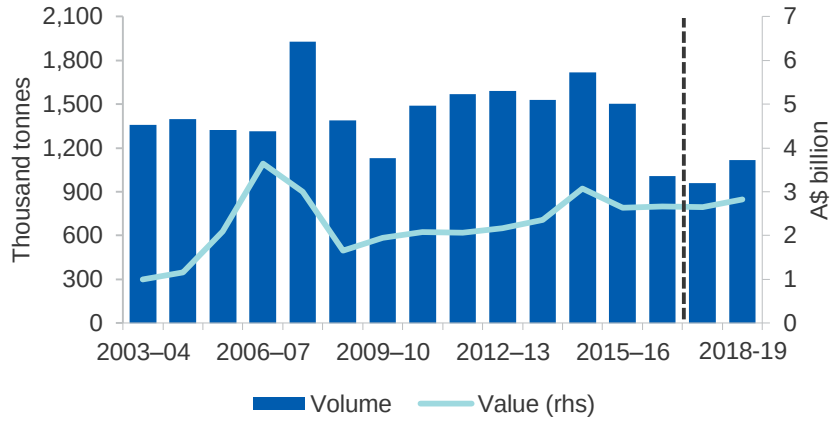
Export earnings are set to grow, supported by rising production

Export earnings are expected to edge down from $A2,667 million in 2016–17 to $2,655 million in 2017–18, due to constraints on mined output. However, strong prices should stimulate increased production in 2018–19, pushing export earnings back up to $A2,826 million.

Export volumes of metallic content are expected to fall from 1,009,000 tonnes in 2016–17 to 959,000 tonnes in 2017–18, reflecting the delayed impact of earlier mine closures and production cuts. Additional output from substantial new mines (Dugald River and Sorby Hills) should support a recovery in production to 1,118,000 tonnes in 2018–19.

Infrastructure development, automotive expansion and a rollout of rail in nearby Emerging economies will create strong demand for Australian zinc over the next few years. However, Australia's export capacity remains constrained, following the closure of MMG's 500,000 tonne Century mine in 2016. This constraint should ease in 2018–19, as new mines open in Western Australia, Queensland, and NSW.

Figure 14.7: Australia's zinc exports



Source: ABS (2017) International Trade in Goods and Services, cat. No. 5368.0; Department of Industry, Innovation and Science (2017)

Table 14.1 Zinc outlook

						Annual percentage change		
World	**Unit**	**2016**	**2017 f**	**2018 f**	**2019 f**	**2017 f**	**2018 f**	**2019 f**
Production								
– mine	kt	12,838	13,599	14,485	15,063	5.9	6.5	4.0
– refined	kt	14,004	13,819	14,693	15,299	-1.3	6.3	4.1
Consumption	kt	13,914	14,369	14,858	15,398	3.3	3.4	3.6
Closing stocks	kt	1,375	825	990	1,089	-40.0	20.0	10.0
– weeks of consumption		5	3	3	4	-41.9	16.1	6.1
Price								
– nominal	US$/t	2,092	2,799	2,820	2,625	33.8	0.7	-6.9
	USc/lb	95	127	128	119	33.8	0.7	-6.9
– real b	US$/t	2,135	2,799	2,762	2,516	31.1	-1.3	-8.9
	USc/lb	97	127	125	114	31.1	-1.3	-8.9
Australia	**Unit**	**2015–16**	**2016–17 s**	**2017–18 f**	**2018–19 f**	**2016–17 s**	**2017–18 f**	**2018–19 f**
Mine output	kt	1,197	843	846	1,003	-29.6	0.4	18.6
Refined output	kt	459	466	500	500	1.6	7.3	0.0
Export volume								
– ore and conc. c	kt	2,222	1,481	1,478	1,845	-33.3	-0.2	24.9
– refined	kt	497	372	325	327	-25.1	-12.8	0.6
– total metallic content	kt	1,507	1,009	959	1,118	-33.1	-4.9	16.6
Export value								
– nominal	A$m	2,628	2,667	2,655	2,826	1.5	-0.4	6.4
– real d	A$m	2,731	2,725	2,655	2,760	-0.2	-2.5	3.9

*Notes: **b** In 2017 US dollars; **c** Quantities refer to gross weight of all ores and concentrates; **d** In 2017–18 Australian dollars; **f** Forecasts*
Source: ABS (2017) International Trade in Goods and Services, Australia, Cat. No. 5368.0; Company reports; Department of Industry, Innovation and Science; International Lead Zinc Study Group (2017); LME (2017); World Bureau of Metal Statistics (2017)