Zinc

Major Australian zinc deposits (Mt)

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

World consumption

- 50% Galvanise steel
- 17% Diecasting
- 17% Brass & bronze alloys
- 6% Rolled zinc
- 6% Chemicals
- 4% Other

Zinc facts

- Zinc exports contributed A$4b to the Australian economy in 2018–19
- Zinc exports are expected to grow by 14 per cent to 1.5mt in 20-21
- Mined zinc production increased to 1.3m tonnes in 2018–19
- Zinc is an emerging battery mineral

Australia’s zinc

- 3rd highest producer of zinc in the world
- 2nd highest zinc exporter in the world
- Holds 29% of world zinc resources
14.1 Summary

- Zinc prices are expected to remain soft for the rest of 2020, with the COVID-19 pandemic weighing on an already weakening market. Prices are expected to grow modestly over the rest of the outlook period, with supply growth tempering any significant price gains. Prices are forecast to rise 3.1 per cent to US$2,055 a tonne over 2020 to 2022.
- Australia’s zinc production is forecast to increase from an estimated 1.3 million tonnes (in metallic content terms) in 2019–20 to 1.6 million tonnes in 2021–22.
- Australia’s zinc export earnings are forecast to decline from $3.5 billion in 2019–20 to around $3.2 billion in both 2020–21 and 2021–22 based on an appreciating Australian dollar, despite increasing production and rising prices.

14.2 Prices

Price declines reflect macroeconomic uncertainty

The COVID-19 pandemic has exacerbated rising weakness in the zinc market, leading to falling prices in recent months. However, production disruptions have helped to moderate recent price movements. After falling to a low of US$1,685 a tonne in the March quarter, the London Metal Exchange (LME) zinc price has since rebounded to around US$2,000 a tonne.

Reflecting softer market fundamentals, zinc inventories began to build with the onset of COVID-19, but the shutdown of mines in South Africa and South America acted to delay the rise in stockpiles. The same production shutdowns pushed treatment and refining charges down to around US$155–170 a tonne in June, after a peak of US$305 earlier in the year.

Inventories are starting to build from decade lows as most mines return to work post COVID-19 lockdowns. LME zinc stocks fell to a 20-year low of 49,775 tonnes in January 2020, but rebuilt quickly to over 100,000 tonnes in June 2020. Shanghai Futures Exchange (SHFE) inventories rose to around 100,000 tonnes during the four months to mid-June.

The Chinese provinces of Yunnan and Gansu announced possible non-ferrous strategic stockpile requirements for smelters in response to the COVID-19 pandemic, making overall stock estimation more opaque.

The LME zinc spot price is estimated to average US$1,995 a tonne during 2020, down from the March 2020 Resource and Energy Quarterly estimate of US$2,045 (Figure 14.1). The impact of the COVID-19 pandemic continues to weigh on prices but may ease later in the year. China’s response to the COVID-19 pandemic and the response of miners as lockdowns ease will help determine the price outlook over the forecast period.

Beyond 2020, rising inventories — as expanding mine production outpaces a recovery in demand — are expected to limit price gains. The price of zinc is expected to average US$2,095 a tonne in 2021, falling modestly to US$2,055 a tonne in 2022, once COVID-19 stimulus packages begin to taper off.

Figure 14.1: Zinc prices and stocks

Source: London Metal Exchange (2020); Department of Industry, Science, Energy and Resources (2020)
14.3 World consumption

The COVID-19 pandemic is assumed to affect the global economy less into the second half of 2020. Globally, the OECD is assuming a contraction in GDP in 2020. (See the macroeconomic outlook chapter). This has led to scaling back of zinc forecasts, with countries choosing a variety of stimulus measures in addition to traditional infrastructure investment. The OECD has forecast a contraction in China’s GDP in 2020 before rebounding in 2021. While economic conditions have lowered China’s zinc consumption in the short term, smelters are returning with treatment charges lowering to attract more concentrate after many miners halted production earlier in the year. Short term shortages in China saw Australian zinc concentrate exports increase by 22 per cent during April.

Movements in world industrial production (IP) generally tend to reflect zinc consumption. World IP growth fell sharply in the 2008–09 Global Financial Crisis, but zinc consumption remained relatively robust. However, large falls in zinc consumption in 2017 were probably driven by resistance to strong price rises induced by the lack of new supply in the previous years. Elsewhere, the relationship was more synchronised (Figure 14.2).

More directly, zinc’s primary use is galvanising steel, either through hot dipping or cold plating. As such, zinc consumption traditionally tracks well with steel production, and this relationship is expected to continue (Figure 14.3).

Figure 14.2: World zinc consumption vs industrial production

Source: International Iron and Steel Institute (2020); CPB Netherlands Bureau for Economic Policy Analysis (2020); Department of Industry, Science, Energy and Resources (2020)

Global automotive sales fell 25 per cent year-on-year during the March quarter and 44 per cent in April year-on-year. The Asia-Pacific region recorded a decrease in automotive sales of 33 per cent year-on-year for the March quarter but only 16 per cent for April year-on-year. Weak sales and worries about the spread of COVID-19 saw automotive production halted at numerous auto assembly lines around the world.

The immediate effects of this are decreased zinc consumption and depressed prices. However, the medium term implications for zinc are more complex. Factories are heading back to work gradually, with various countries implementing stimulus packages, including in the renewable energy space (see the macroeconomic outlook chapter and lithium chapter, Section 15.3, Europe). European sales of electric vehicles were
up for the March quarter in Germany, the UK and France. With iron ore prices relatively high, stimulus measures in construction have been slower with central banks instead concentrating on interest rates, quantitative easing and employment measures (see steel and iron ore chapter). China’s changes in electric vehicle subsidies may bring consumption forward for lithium but also for zinc as part of specialist galvanised steel. Additionally, Germany recently announced incentives to support electric vehicle sales (see the lithium chapter, Section 15.3). Whilst this may not fully offset the COVID-19 consumption dip, it may provide some important relief.

China and South Korea are expected to continue to dominate global zinc consumption, though rising construction spending in India is expected to gradually boost its market share. The OECD has forecast GDP growth for India in 2021 (see macroeconomic outlook chapter).

Global zinc consumption is forecast to rise modestly over the outlook period, from 13.5 million tonnes in 2020 to 14.0 million tonnes in 2022, having fallen from 13.7 million tonnes in 2019 (Table 14.1).

**Zinc batteries for renewable energy**

Zinc is forecast to play an increasing role in renewable energy storage over time, with new demand sources providing further opportunities for Australian mines. During the March quarter, Redflow, an Australian zinc bromine battery manufacturer received repeat orders for their batteries from a New Zealand telecommunications company. US-based Zinc Five has also received venture capital funding to develop the world’s first nickel-zinc rechargeable battery.

**14.4 World production**

Mine production is set to rise over the outlook period

Global mine output is expected to increase from 13.2 million tonnes in 2020 to 14.2 million tonnes in 2022 (Figure 14.4). The rise in output is largely the result of earlier price incentivised drilling (Figure 14.5). High prices in early 2018 — peaking at US$3,605 a tonne in February 2018 — resulted in increased funding to drill out resources. However, resource drilling takes time, especially when there are no initial resource figures — only zinc mineralisation intersected in wide spaced drill holes. Consequently, initial resources may lag high commodity prices which justified the drilling by a couple of years.

![Figure 14.4: World zinc production, metallic content](image)

**Source:** International Lead Zinc Study Group (2020); AME Mineral Economics (2020); Department of Industry, Science, Energy and Resources (2020)

However, the recent zinc price decline and COVID-19 may deter higher cost operations already in shutdown from re-entering the market and delay developments. Penoles has opted not to reopen the Francisco I. Madero mine in Mexico, citing low zinc prices. Most major zinc producing nations are now either out of lockdown or considering easing lockdown.

Regionally, 11 per cent of production may be lost in 2020, with 17 per cent lost in Africa and 14 per cent lost in Central and South America. Production losses in Namibia included the placing on care and maintenance of the Skorpion open pit operation. The mine has an associated solvent extraction–electrowinning refinery for its zinc carbonate ore. The operation faced technical difficulties prior to COVID-19 and may face extended downtime while these issues are resolved. South Africa’s Gamsberg and Black Mountain mines were also affected by the COVID-19 related lockdown, which is now easing.
Production in Central and South America was strongly affected by closures in Bolivia, with operations at Colquiri, San Vincente and San Cristobal suspended. Mines in Mexico were affected by closure covering operations run by Grupo Mexico, Newmont and Gold Resource Corporation, although smelters appear to be operating at reduced capacity. Peru’s miners are returning to work with the Antamina operation having recently resumed production. Canadian operating capacity is estimated to have been reduced by 12 per cent over 2020 due to COVID-19, with operations affected in Quebec including the Matagami operation.

As mined supply of concentrate once again increases, limits in smelter capacity will limit uptake. With high grade projects in the development pipeline, this may cause lower grades mines currently closed to reconsider restarting. COVID-19 has resulted in the delay of numerous resources projects globally, including zinc projects. However, the high grade nature of upcoming zinc projects means that delays are less likely to be lengthy due to the higher revenue likely from the higher grades. While high grade production was due to be developed at Dairi in Indonesia and at Kipushi in the Democratic Republic of Congo, the COVID-19 pandemic has now delayed proceedings. Kipushi was scheduled to come online around 2022. Gamsberg was ramping up in 2020 towards 200,000 tonnes per annum, but will likely have its timetable affected by the COVID-19 pandemic. Brazil’s Aripuna project (80,000 tonnes per annum) may also be delayed in its 2021 start up.

Kazakhstan appears to not have been affected by COVID-19 zinc mine closures. Kazakh material is supplied via an overland route to Western China, as opposed to the dominant Australia to Shanghai trade route. This may impact other producers as they try to re-enter the market. Kazakhstan’s new Glencore owned mine, Zhairem, has had its start up deferred, with production now scheduled for 2021.

Refinery production may struggle to keep pace with mine output

Refinery production is expected to largely follow the trajectory of mined production. Global zinc refinery capacity is estimated to have decreased by around 8 per cent during COVID-19, with Namibia the most affected as a result of the Skorpion operations being stalled. Operations appear least affected in India, with capacity falling by around 5 per cent. Smelters in Mexico are likely to have been considerably affected by mine closures.

Post COVID-19, smelters in China were back up to over 80 per cent utilisation but in May lower treatment charges have resulted in refined zinc output declining 1.1 per cent. The smelters may also face short term constraints due to acid inventories.

Increasing supplies of concentrate will likely result in increasing treatment and refining charges if there is insufficient capacity. This is likely to form part of the evaluation for higher cost operations as they contemplate returning to work. Increases in India’s smelting capacity at several smelters may provide some offset to capacity pressures elsewhere.
14.5 Australia

Export earnings declining modestly

Australia’s zinc export earnings are forecast to decline from $3.5 billion in 2019–20 to around $3.2 billion in both 2020–21 and 2021–22 based on an appreciating Australian dollar, despite rising production and prices.

Australian mine production is expected to increase

Zinc production for the March quarter was down 5.6 per cent in Australia quarter-on-quarter, partly due to the COVID-19 outbreak. The Century mine in Queensland (QLD) had difficulties ramping up during the March quarter, with wet season events causing recoveries to drop from 49 to 46 per cent.

Production at Mt Isa rebounded from the December quarter low of 75,300 tonnes of zinc in concentrate, rising to 85,200 tonnes in the March quarter 2020. This was more in-line with the previous 12 months. Mount Garnet in QLD was also placed on care and maintenance due to COVID-19. Production for the quarter was 1,384 tonnes. High costs may threaten the mine’s long term viability.

COVID-19 also impacted on the commissioning at the Woodlawn mine in New South Wales (NSW). The operation is likely to resume production, due to helpful by-products credits. Production increased at Hera and Peak in NSW: the ore at these mines is gold based with zinc a by-product. Hence, with high gold price, zinc production increased. Around 30 per cent of lost production in NSW was partly offset by increased by-product output. Production at McArthur River in the Northern Territory was approximately steady at 68,500 tonnes of zinc in concentrate. No significant production was recorded in South Australia or Victoria (Figure 14.6).

Foreign exchange rates may challenge miners, with export earnings in 2020–21 and 2021–22 forecast to decline relative to 2019–20, despite increasing production. Australia’s zinc mined production is projected to increase from 1.3 million tonnes (in metallic content) in 2019–20 to 1.6 million tonnes in 2021–22 based principally on expansion at Century, which is experiencing difficulties in its planned ramp up of production but has maintained guidance for the upcoming June quarter (Figure 14.7).
Australia refines about 3.4 per cent of the world’s zinc. Refined production of zinc is forecast to increase by 50,000 tonnes a year over the outlook period. There are two zinc refiners in Australia: Nyrstar, which refines zinc at its Hobart refinery, and South Korean-owned Sun Metals, which operates a smelter near Townsville. The expansion of the Sun Metals refinery is due for completion in 2021.

### Exploration expenditure declined
Exploration expenditure for silver, lead and zinc has declined 50 per cent year-on-year for the March quarter, following a 21 per cent decline in zinc prices over the same period. Exploration was impacted disproportionately due to the COVID-19 outbreak as well as the discretionary nature of the expenditure (Figure 14.8).

### Revisions to the forecast
Compared with the March 2020 Resources and Energy Quarterly, estimates for export revenue were revised up 1.6 per cent for 2020–21 and down 0.6 per cent for 2021–22. This resulted from improvements in the forecast price for zinc with forecast production increases slightly tempered.
Table 14.1: Zinc outlook

<table>
<thead>
<tr>
<th>World</th>
<th>Unit</th>
<th>2019</th>
<th>2020&lt;sup&gt;f&lt;/sup&gt;</th>
<th>2021&lt;sup&gt;f&lt;/sup&gt;</th>
<th>2022&lt;sup&gt;f&lt;/sup&gt;</th>
<th>2020&lt;sup&gt;f&lt;/sup&gt;</th>
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<td></td>
</tr>
<tr>
<td>– mine</td>
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<tr>
<td>– kt</td>
<td></td>
<td>13,684</td>
<td>13,530</td>
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<td>2.3</td>
<td>1.1</td>
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<td>– weeks of consumption</td>
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<td>1,204</td>
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<tr>
<td>– nominal</td>
<td>US$/t</td>
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<td>1,995</td>
<td>2,095</td>
<td>2,055</td>
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<td>– refined</td>
<td>USc/lb</td>
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<td>95</td>
<td>93</td>
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<td>5.0</td>
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<td>– refined</td>
<td>USc/lb</td>
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<td>90</td>
<td>93</td>
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<td><strong>Australia</strong></td>
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</tr>
<tr>
<td>– unit</td>
<td></td>
<td>2018–19</td>
<td>2019–20&lt;sup&gt;s&lt;/sup&gt;</td>
<td>2020–21&lt;sup&gt;f&lt;/sup&gt;</td>
<td>2021–22&lt;sup&gt;f&lt;/sup&gt;</td>
<td>2019–20&lt;sup&gt;s&lt;/sup&gt;</td>
<td>2020–21&lt;sup&gt;f&lt;/sup&gt;</td>
<td>2021–22&lt;sup&gt;f&lt;/sup&gt;</td>
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<tr>
<td>Mine output</td>
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<td>1,523</td>
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<tr>
<td>– ore and concentrate&lt;sup&gt;b&lt;/sup&gt;</td>
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<td>2,444</td>
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<td>2,804</td>
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<td>336</td>
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<td>1,598</td>
<td>10.1</td>
<td>5.3</td>
<td>4.2</td>
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<tr>
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<td>3,471</td>
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<td>3,133</td>
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<td>-10.2</td>
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Notes: <sup>a</sup> in 2020 US dollars; <sup>b</sup> Quantities refer to gross weight of all ores and concentrates; <sup>c</sup> In 2019–20 Australian dollars; <sup>f</sup> Forecast, <sup>s</sup> Estimate.

Source: ABS (2020) International Trade in Goods and Services, Australia, Cat. No. 5368.0; Company reports; Department of Industry, Science, Energy and Resources (2020); International Lead Zinc Study Group (2020); LME (2020); World Bureau of Metal Statistics (2020)