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

Zinc facts

- Zinc ore was used in ancient Greece to produce brass
- Zinc is used by the human body to fight infection
- Zinc is used in wound-care and sunscreen
- Zinc is an emerging battery mineral

World consumption

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

Australia’s zinc

- 3rd highest producer of zinc in the world in 2019
- World’s no.1 zinc exporter in 2019
- Holds 29% of world zinc resources
14.1 Summary

- Zinc prices are firm heading into 2021, with demand strong due to COVID-19 government stimulus packages focused on infrastructure spending. Prices are expected to increase from an estimated average of US$2,245 a tonne in 2020 to US$2,285 a tonne in 2021, before rising supply pushes the price lower to an average US$2,170 a tonne in 2022.
- Australia’s zinc mine production is forecast to rise from 1.3 million tonnes (metallic content) in 2019–20 to 1.6 million tonnes by 2021–22 (see Australia section)
- Australia’s zinc export earnings are forecast to decline from $3.6 billion in 2019–20 to around $3.2 billion in both 2020–21 and 2021–22, as the Australian dollar appreciates and tops out.

14.2 Prices

Price increases reflect anticipation of stimulus packages

Zinc prices averaged US$2,472 a tonne during the September quarter, performing more strongly than expected. During the September 2020 quarter, production recovered from the COVID-19 pandemic. Concentrate imports to China in the September 2020 quarter were up 14 percent, year-on-year, placing upward pressure on prices. However China’s imports were down 11 per cent in September year-on-year, as China substituted imports with production of its own zinc concentrates.

Treatment and refining charges are still under pressure despite increasing supply, with charges understood to be around US$100 a tonne. The increasing supply of zinc concentrate, anticipated to be in surplus next year, may yield a rise in these charges. However, this will depend on concentrate moving from the mines to the smelters in an orderly manner, despite potential supply disruptions from the COVID-19 pandemic. China’s zinc smelters have called for a more co-ordinated approach, similar to the copper smelters. However, the Chinese provinces of Yunnan and Gansu have recently called for non-ferrous strategic stockpile requirements for smelters in response to the COVID-19 pandemic in late April.

At the time of writing, zinc stocks stand at close to 280,000 tonnes for both the LME and Shanghai Futures Exchange (SHFE). The impact of stimulus packages and continuing uncertainty with the COVID-19 pandemic will likely influence prices positively in the short to medium term, albeit with an easing impact next year as surplus from the concentrate market becomes available. Short term constraints have increased, after a supply disruption in South Africa unrelated to the COVID-19 pandemic.

The LME zinc spot price is estimated to average US$2,245 a tonne over 2020, up from the September 2020 Resource and Energy Quarterly estimate of US$2,080 (Figure 14.1). The strength of China’s recovery from the COVID-19 pandemic as well as additional stimulus packages in other countries is underpinning a solid short to medium term outlook for zinc (see macroeconomic outlook chapter).

In 2021, the zinc price is forecast to average US$2,285 a tonne, falling to US$2,170 a tonne in 2022, as stimulus measures begin to taper and high grade production comes online around 2021–22 from a number of deposits in Indonesia, and the Democratic Republic of Congo.

Figure 14.1: Zinc prices and stocks, annual

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

Infrastructure and green stimulus packages spur consumption

Zinc consumption has been reasonably correlated with the world IP cycle over the past decade (Figure 14.2). Zinc’s primary role is in galvanising steel, either through hot dipping or cold plating. Consumption is thus expected to continue to move with steel production, construction, and vehicle sales (Figure 14.3). Global zinc concentrate consumption was down sharply in the first half of 2020 as the COVID-19 pandemic hit, but September quarter 2020 data showed some improvement.

Infrastructure stimulus packages are assumed to still spur zinc consumption in 2021. Stimulus packages in China designed to buoy construction are also supporting zinc demand via galvanised steel inputs to construction as well as in automotive production.

Global automotive sales fell by 2 per cent year-on-year during the September quarter, but rose 20 per cent month-on-month in September. Europe followed a similar pattern but September sales rose by 43 per cent month-on-month, propelled by buyers seeking to beat tightening emissions requirements, which come into force on 1 January 2021. Europe is likely to see zinc consumption rise in the short term. However, China and South Korea are still expected to continue to dominate global zinc usage.

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, after having fallen from 13.7 million tonnes in 2019 (Table 14.1).

Zinc batteries continue to improve

Zinc is forecast to play an increasing role in energy storage over time, with new demand sources providing further opportunities for Australian mines. Redflow, an Australian zinc bromine battery maker, is due to test its Gen3 battery with customers towards the end of 2020. These batteries have applications in stationary power storage, such as attached to homes. Additionally, Thomas Maschmeyer’s zinc bromine battery technology is being utilised at Sydney University.
14.4 World production

Mine production is set to rise over the outlook period

Strength in the zinc price continues to draw miners back into production, with COVID-19 containment measures continuing to ease. Global mine output in 2020 is estimated at 13.0 million tonnes, rising to 14.3 million tonnes in 2022 (Figure 14.4). The rise over the outlook period is the result of investments in mine commissioning and expansion. High grade production is scheduled to come online from the Dairi project in Indonesia in 2021–22. The resource grade of 11.5 per zinc makes this project one of the higher grade undeveloped resources. High grade production on a similar timeframe is also due from the refurbishment of Kipushi in the Democratic Republic of Congo. Resource grades average just below 11 per cent but higher grade zinc rich sections average over 35 per cent zinc.

Over the past nine months, significant shifts have taken place in the production of zinc. The global production of zinc for the nine months to September 2020 decreased by 7.0 per cent over the corresponding period in 2019, with Australia up 3.3 per cent, China down 3.1 per cent and Peru down 13 percent.

However, production in the September quarter 2020 compared with the corresponding period in 2019 shows China substituting domestic production of concentrate with product it previously may have sourced from Australia and Peru. The global production of zinc for the September quarter 2020 compared to the previous corresponding period in 2019 was unchanged, but with Australia down 1.9 per cent and Peru down 18 percent, but China up 4.6 per cent.

Glencore’s output for the nine months to September rose by 4.0 per cent, largely as a result of higher throughput from Mt Isa in Queensland and higher grades from its Antamina operation in Peru (held by Glencore, BHP and Teck Resources). Trevali’s Santandar mine in Peru is back at full production levels, with output up 17 per cent from the June quarter 2020, albeit down compared to the June quarter 2019.

South African production was steady during the quarter, after a low of 4,000 tonnes in April. However, Vedanta’s Gamsberg mine halted production, after a geotechnical failure. The operation produced 92,000 tonnes last year and was ramping up towards 250,000 tonnes per annum. Vedanta’s Skorpion open pit operation in Namibia remains on care and maintenance.

Figure 14.4: World zinc mine production, metallic content

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

Nexa Resources increased zinc production from its operations, primarily in Peru and Brazil, by 31 per cent quarter-on-quarter to the end of September. However, production was still down 16 per cent compared to the September quarter 2019. The COVID-19 pandemic continues to pose risks, with increasing cases close to mines that could lead to restrictions. Countrywide, production from Peru has rebounded strongly, although mine output is not yet matched by concentrate exports. Operations resumed at Sumitomo’s San Cristobal mine in Bolivia following their second cessation in late August due to the COVID-19 pandemic.

Initial estimates showed a possible 11 per cent reduction of global mine production likely to be lost in 2020, due to the COVID-19 pandemic and
other supply disruptions. However, increased production from miners responding to higher prices are now likely to offset these production losses, and result in production being relatively stable in 2020 compared with 2019.

**Refineries continue to operate during COVID-19**

Refinery production is expected to follow mine production over the outlook period. Primary and secondary zinc production rose by 0.4 per cent in the nine months to September 2020, with China output rising by 2.1 percent, but others falling by 0.9 per cent over the corresponding period in 2019.

However, there are short term constraints with supply from Peru that may reach the market as 2021 begins. This may be further exacerbated if there are any additional containment measures as a result of the COVID-19 pandemic. However, the substitution of China’s own product into its smelters may offset some of the supply chain risk.

Smelters in China are operating well. Zinc imports from Australia rose by 33 per cent in the 9 months to September 2020 (compared to the corresponding period in 2019) but fell 39 per cent month-on-month between September and August 2020.

In 2021, rising zinc concentrate supply is likely to result in higher treatment and refining charges, as smelters approach full capacity. However, refiners will need to consider the risk of further disruptions to supply as a result of the ongoing COVID-19 pandemic. Changes to refinery production are less responsive to price changes than mining production, due to the higher costs of restarting smelters.

Refined production estimates for 2020 and forecasts for the outlook period are largely unchanged compared with the September quarter 2020 *Resources and Energy Quarterly* forecasts. Refined production for 2020 (including recycling) is estimated at 13.6 million tonnes, with 2021 forecast at 13.9 million tonnes and 2022 forecast at 14.1 million tonnes (Figure 14.5).

![Figure 14.5: World zinc refinery production, metallic content](image)

**14.5 Australia**

**Export earnings declining modestly**

Australia’s zinc export earnings are forecast to decline from $3.6 billion in 2019–20 to around $3.2 billion in both 2020–21 and 2021–22, as the Australian dollar appreciates and tops out.

**Australian mine production is expected to increase**

Australia’s September quarter 2020 zinc production was up 2.1 per cent quarter-on-quarter (Figure 14.6). Production at Century in Queensland during the September quarter was stable at 34,000 tonnes of zinc. Elsewhere in Queensland, production at Mt Isa rose by 2.0 per cent to over 91,000 tonnes, whilst Dugald River production rose by 5.5 per cent to over 46,000 tonnes. Mount Garnet in Queensland restarted processing ore in May, after closing during late March due to health concerns surrounding the COVID-19 pandemic. Overall, Queensland production rose by 10 per cent in the September quarter 2020 compared to the same period in 2019.
Production from Mc Arthur River in the Northern Territory decreased to just below 66,000 tonnes in the September quarter 2020, down by 4.1 per cent compared to the year prior. In New South Wales (NSW), production increased nearly 14 per cent at Hera, whilst gold and silver production from the same mine decreased, largely as a result of going through some lower grade stopes as a part of the mine plan. However at Peak in NSW, output decreased by 22 per cent, due to development needs at the mine.

Australian export volumes for zinc concentrate declined by 33 per cent in the September quarter 2020, more than reversing the gains of the June quarter. This compares with a 26 per cent decrease by value over the same period, based on stronger zinc prices over the quarter.

In the September quarter 2020, refined exports fell by 13 per cent from the June quarter, as a result of lower Chinese imports. However, export values fell by 7.4 per cent over the same period, due to higher zinc prices.

**Figure 14.6: Australia’s zinc mine output by state, metallic content**

Australia’s zinc mine production is forecast to increase from 1.3 million tonnes (in metallic content) in 2019–20 to 1.6 million tonnes in 2021–22, driven by the possible expansion at the McArthur River operations. The rising Australian dollar may reduce revenue, with export earnings in 2020–21 and 2021–22 forecast to decline relative to 2019–20, despite increasing production (Figure 14.7).

**Refined production**

Production of refined 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 (see the recently released *Resources and Energy Major Projects 2020 Report*).
Exploration expenditure increased

Exploration expenditure for silver, lead and zinc has increased 56 per cent quarter-on-quarter for the September quarter, as the zinc price appreciated by 19 per cent over the same period (Figure 14.8). The increase in exploration follows increased prices as a result of stimulus measures in response to the COVID-19 pandemic.

**Figure 14.8: Exploration expenditure on silver, lead and zinc versus zinc prices**

Compared with the September 2020 *Resources and Energy Quarterly*, forecasts for export revenue were revised down by 0.3 per cent for 2020–21 and down 0.4 per cent for 2021–22 to around $3.2 billion for both periods. The main driving factor was changes to the forecast price for zinc along with an appreciating Australian dollar.

Source: ABS (2020) Mineral and Petroleum Exploration, Australia, 8412.0; Company reports; Department of Industry, Science, Energy and Resources (2020)

Revisions to the forecast
### Table 14.1: Zinc outlook

<table>
<thead>
<tr>
<th>World</th>
<th>Unit</th>
<th>2019</th>
<th>2020&lt;sup&gt;s&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;s&lt;/sup&gt;</th>
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<th>2022&lt;sup&gt;f&lt;/sup&gt;</th>
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<td>kt</td>
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<td>104</td>
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<td>102</td>
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<td>Mine output</td>
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<td>1,340</td>
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<td>– ore and concentrate&lt;sup&gt;c&lt;/sup&gt;</td>
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<td>3,159</td>
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<td>-12.9</td>
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Notes: a includes secondary refined zinc; b in 2020 US dollars; c Quantities refer to gross weight of all ores and concentrates; d in 2020–21 Australian dollars; f Forecast; s 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)