

Zinc

Resources and Energy Quarterly December 2019

Australian zinc exports are tipped to **grow by 14%** to 1.4 million tonnes in 2019



Australian mined zinc production surged to **1.2 million tonnes** from 2018 –19

Zinc exports contributed **\$4 billion** to the Australian economy in 2018



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

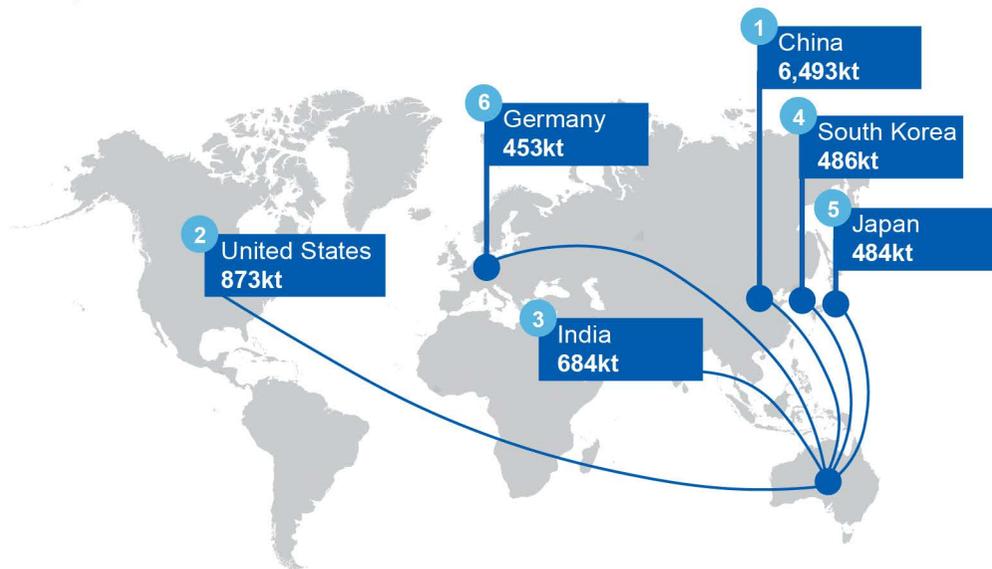
Australia holds **28%** of the world's known zinc resources

Major Australian zinc deposits (Mt)

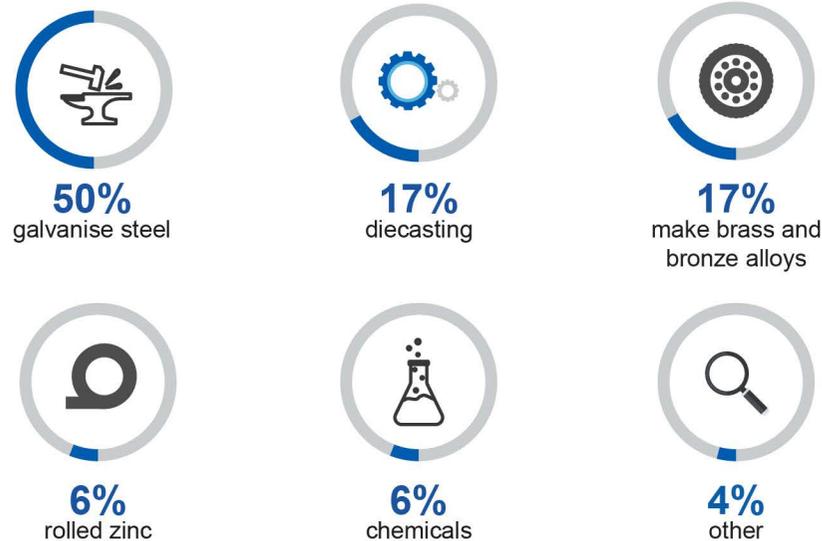
- <0.01
- 0.02–0.03
- 0.04–0.09
- 0.10–0.20
- 0.21–0.44
- >0.45
- Deposit
- Operating mine



Key zinc consumer markets



Global uses of zinc



14.1 Summary

- Zinc prices are expected to decrease over the forecast period, as robust production growth boosts inventories and weak industrial production shrinks demand for the metal.
- Australia's zinc production is surging, having increased by 30 per cent from 2017–18 to 2018–19. Production is forecast to increase further over the outlook period.
- The value of Australia's zinc exports is forecast to decline from \$4.0 billion in 2018–19 to \$3.2 billion in 2020–21, due mainly to softer prices.

14.2 Prices

2019 prices reflect macroeconomic uncertainty and weaker fundamentals

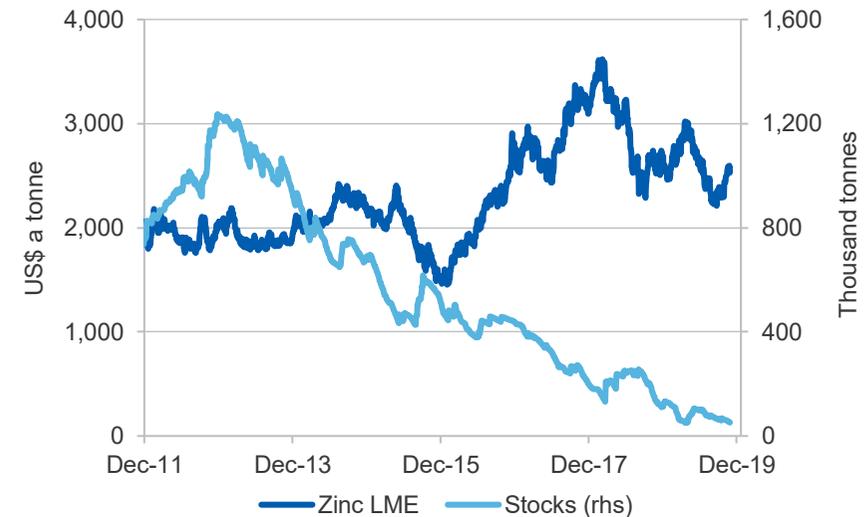
It has been a rocky but overall subdued year for zinc prices. Prices have averaged a lukewarm US\$2,583 a tonne – 12 per cent lower than in 2018 — punctuated by rallies due to supply shocks in April and October. Like other base metals, zinc has been affected by the trade tensions between the United States and China, which have dampened activity in the manufacturing and automotive industries — both big consumers of refined zinc and other metals.

2019 has been marked by noticeable price volatility. With world mined production widely expected to increase by over 6 per cent at the start of the year, there has been a lingering expectation that the zinc metal market will soon be in surplus – however, this has yet to materialise. Firstly, mined production has been considerably less than expected, now forecast to grow by just 1.5 per cent in 2019. Moreover, supplies of the refined product have been affected by smelter bottlenecks in top zinc producer, China, as well as outages in Canada, Australia, Russia, and Namibia. While smelter production has picked up serious pace in China in the second half of the year, this refined output has perhaps not wound its way into zinc inventories as quickly as expected.

Zinc inventories reached record lows in 2019, which has helped to push up prices. In April, London Metal Exchange (LME) zinc stocks fell to a thirty year low of 50,425 tonnes, or 1.4 days of supply, which prompted the LME

price to eclipse US\$3,000 per tonne. In October, LME stocks once again dipped below 55,000 tonnes, which helped to add 17 per cent to the three-year price lows experienced in September (see Figure 14.1).

Figure 14.1: Historical zinc prices and stocks



Source: London Metal Exchange (2019) and Department of Industry, Innovation and Science

Price falls likely over the outlook period, on rising supply and tepid demand

It is expected that zinc prices will decline over the two-year outlook period, falling from an average US\$2,570 a tonne in 2019 to US\$2,371 a tonne in 2021 or an average of -6.4 per cent per year.

Robust production growth of 7.3 per cent forecast for 2020 means that it is only a matter of time before mined zinc finds its way to smelters and, eventually, LME and Shanghai Futures Exchange (SHFE) inventories. With the market firmly back into surplus, prices should drift lower (see Section 14.4).

Demand growth for zinc over the next two years is likely to be subdued (see Section 14.3.) As an anti-corrosive, or galvanising metal, zinc usage tends to follow industrial production growth and steel use. Industrial

production growth is currently forecast to average 2 per cent over the outlook period — not contractionary territory, but fairly weak.

The Phase One deal between the United States and China is positive news for zinc and other base metals, which have been adversely affected by economic uncertainty and slowing manufacturing activity. The deal is expected to aid a recovery in industrial production growth in 2020, which is one of the main drivers of zinc demand.

Figure 14.2: Annual change in global steelmaking and zinc use

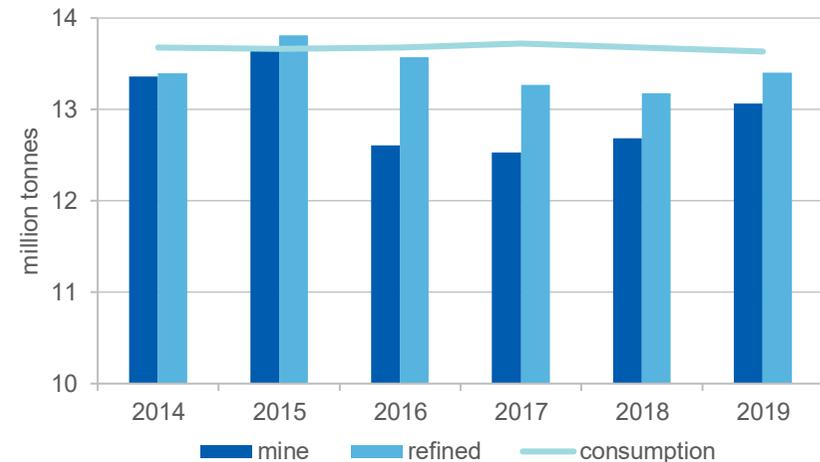


Source: International Iron and Steel Institute (2019), Department of Innovation, Industry and Science (2019) estimates

Zinc market surplus no longer anticipated for 2019

In the September 2019 *Resources and Energy Quarterly*, it was forecast that a very small surplus of refined zinc would occur in 2019. However, this surplus has been revised down to a small deficit, as a result of a number of smelter outages in 2019 (see Figure 14.3 and Section 14.4).

Figure 14.3: Zinc production versus refined zinc demand



Source: International Lead and Zinc study Group (2019) and Department of Industry, Innovation and Science

14.3 World consumption

Refined zinc consumption estimated to decline weakly in 2019

Demand for refined zinc has been adversely affected by trade tensions and slow industrial production in 2019. Zinc's main use is in protecting steel and other metals used in the construction, transport and manufacturing industries, so decade-low global growth and weaker manufacturing activity (see *macro* chapter) have taken their toll on metal usage. While Chinese demand for refined zinc has picked up after declining in 2018, and the United States looks set to report more than 5.0 per cent growth for 2019, this has been offset by diminished demand in Japan, Europe and India. As a result, refined zinc demand is expected to fall by 0.3 per cent in 2019, to 13.6 million tonnes.

The demand outlook for 2020 and 2021 is one of subdued growth. World steel production is forecast to grow slowly over the outlook period, increasing by around 1 per cent between 2019 and 2021 (see the *steel* chapter and Figure 14.2). Refined zinc consumption should follow suit; it is

anticipated to increase by 286,000 tonnes from 2019 to 2021, or an average of .6 per cent a year. China, India, and other Asian economies are expected to drive this growth; elsewhere metal usage is likely to decline.

Emerging markets to play starring role in rising zinc consumption

Developing Asian economies are forecast to play the main role in fuelling zinc consumption over the outlook period (see Figure 14.4). China's economy is expected to grow at 5.5 to 6.0 per cent over the outlook period, almost double the global average, and this should spur zinc usage. Other Asian economies, including India, Vietnam, and Thailand, are also expected to consume considerable quantities of zinc over the outlook period, as rising urbanisation and industrialisation lead to greater use of galvanised steel. Refined zinc consumption growth is forecast to average 2.5 per cent in China, India, and developing Asia from 2019 to 2021.

India has high potential for zinc usage, and is forecast to show the greatest growth in demand over the outlook period. India's per capita consumption of zinc is only 30 per cent of the world average of 2.0 kg per person, and the government has indicated interest in promoting greater use of the anti-corrosive — and therefore more sustainable — metal. Indian resources company, Vedanta Limited, has also indicated intentions to become the world's top zinc producer by 2022 through its subsidiaries Hindustan Zinc and Zinc International.

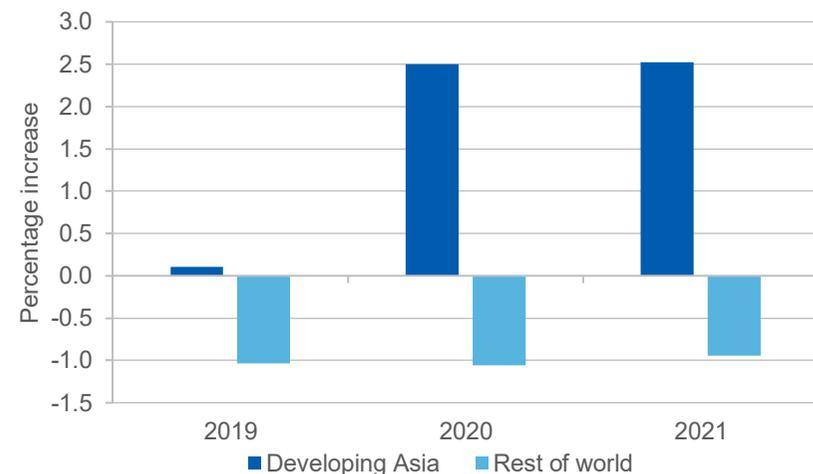
Moreover, the country has ambitious steel-production targets, aiming to more than double annual steel consumption to 255 million tonnes by 2030. While the country will need to overcome a number of challenges to achieve this (see *steel and iron ore* chapter), it has already become a pivotal player in global steel production, and is forecast to grow production by an average of 6.8 per cent from 2019 to 2021.

In the rest of the world, refined zinc usage has fallen in 2019. In Germany, usage is estimated to have declined by 11 per cent from 2018, driven in part by a deceleration in automotive production. Usage in the United Kingdom is forecast to fall by 10 per cent, after the second biggest steel producer, British Steel, entered insolvency in May. In Japan, usage is

forecast to fall by 2 per cent from 2019, as a result of a weakening manufacturing sector.

While European monetary policy may help to boost economic growth in the Eurozone, the outlook for refined zinc usage outside of developing Asia is fairly sombre. Consumption of the metal is therefore forecast to decline by an average of 1.0 per cent to 2021 (see Figure 14.4).

Figure 14.4: Forecast increase in refined zinc usage



Source: International Lead and Zinc study Group (2019) and Department of Industry, Innovation and Science.

China likely to continue to use large amounts of zinc, but risks have risen

China accounts for around half of global zinc and steel consumption, and its appetite for zinc remains large. In the September 2019 *Resources and Energy Quarterly*, refined output growth was forecast to grow only marginally, as a result of poor first half results. While zinc consumption has picked up on the back of an unexpected jump in manufacturing activity in the August to October period, Chinese metal usage is still only estimated to have grown by 0.1 per cent in 2019. Trade tensions, which have impacted manufacturing activity and business confidence, as well as a slowing economy, appear to be the main causes.

Chinese refined zinc usage is forecast to pick up in 2020, growing to 6.8 million tonnes. Chinese output is expected to grow again in 2021. However, there is a degree of uncertainty surrounding the pace of China's economic growth. While the government is implementing economic stimulus measures – in an attempt to offset the impacts of trade frictions — these efforts are likely to be more restrained than previously.

China is also having to contend with economic challenges of a deeper, structural nature, such as mounting consumer debt, an ageing population, and low productivity, which complicate future growth prospects. Notwithstanding this, China's rate of GDP growth remains robust and will likely continue to be one of the highest in the world, averaging between 5.5 and 6.0 per cent over the forecast period. This growth should sustain zinc demand growth, though perhaps not at previous rates.

14.4 World production

Mine output to rise over the outlook period

Zinc mine production growth in 2019 has been revised down from 4.4 percent to 1.5 per cent compared to the September 2019 *Resources and Energy Quarterly*, due to weaker than expected production in the first half of the year. However, output is expected to rise by 7.3 per cent in 2020 to 13.8 million tonnes, equating to an extra 937,000 tonnes of concentrate in the world market. It is then forecast to slow to 1.1 per cent in 2021. China should comfortably retain its position as the number one producer of mined output, though its output growth will slow from 2019 to 2021.

Australia is at the forefront of world output growth, expected to contribute an average of 1.3 million tonnes per year to global supply over the outlook period. Most of this growth is weighted towards 2019, when mined production is estimated to have surged by 30 per cent. African production is expected to grow by 25 per cent in 2020 to 738 thousand tonnes of mined zinc, mainly as a result of the ramp of Vedanta's Gamsberg mega mine. Kazakhstan too will step up as a global zinc producer, with three new reported mining operations estimated to add total capacity of 355,000 tonnes per year to the global market as they open over the next 3 years.

2019 has not delivered in terms of the high zinc output expected at the start of the year, with delayed projects and weaker performance from big mines seeing expected growth falling from 7 per cent — as forecast in the March 2019 *Resources and Energy Quarterly* — to 1.5 per cent. Peru — the world's second biggest zinc producer — decreased output by 7 per cent in the first nine months of 2019. Mexican production was also affected by two blockades at Newmont Goldcorp's large Peñasquito mine. Meanwhile, Indian production growth has also been weaker, as a number of mines navigate the transition from open pit to underground mining.

2019 has been marked by smelter outages, but output should rise in 2020

In the last few months, Chinese smelter output has ramped up, fuelled by record high spot processing and treatment charges – prices charged by smelters for the cost of refining concentrates into pure zinc – and the increasing availability of concentrates. As a result, Chinese refined zinc output is expected to grow by 5.6 per cent this year to 6.1 million tonnes.

Outside of China, refined zinc metal supply has suffered a number of setbacks in 2019. Canada's Teck Resources — one of the world's biggest zinc producers — is estimated to have lost between 20,000 and 30,000 tonnes of metal production from its Trail smelter, as a result of an electrical equipment failure in August. Earlier in the year, Africa's largest zinc refinery, Skorpion Zinc, was shut for five weeks because of a strike. Now Skorpion will be closed by its Indian owner, Vedanta, from November through to the end of February 2020 as a result of a reduction in ore from the open-pit Skorpion mine. Prior closures in Russia and the United States have also had an impact, as they have reduced refining capacity.

Nonetheless, rising Chinese production should be enough to tip global refined production into positive growth in 2019, after four years of decline. This trend should continue over the forecast period: total refined output is predicted to grow by 3.5 percent to 13.8 million tonnes in 2020, and then by 1.1 percent in 2021 to 14.0 million tonnes.

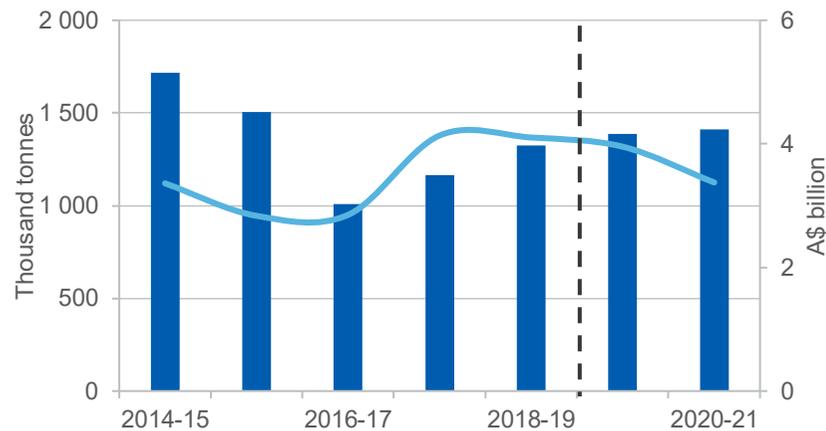
India is expected to have the largest growth in refined output — a forecast 16.3 per cent rise from 2018 to 2021, to 868,000 tonnes, or 7.6 per cent.

14.5 Australia

Zinc exports are expected to grow in line with rising production

Australian mined zinc production surged to 1.2 million tonnes from 2018–19, a 30 per cent increase on 2017–18. By 2019–20, production will have almost recovered to the levels achieved before the 2015 phase-out of the New Century mine. Zinc production is expected to stay strong into 2020–21, but should then taper off.

Figure 14.5: Australian zinc exports, metallic content



Source: ABS (2019) *International Trade in Goods and Services*, 5368.0, Department of Innovation, Industry and Science (2019)

Exports are tipped to grow in line with rising production, but lower prices will constrain the increase in export values. Volumes (in metallic content terms) are forecast to reach 1.4 million tonnes in 2019–20 and grow weakly in 2020–21. Earnings are forecast to decrease from an estimated \$4 billion in 2018–19 to \$3.3 billion in 2020–21 (see Figure 14.5).

Australian mined production is surging

Australia's zinc production increased by 30 per cent from 2017–2018 to 2018–19. This increase was driven by production in Queensland (see Figure 14.6.), where a number of producers have revitalised operations that were closed in 2015, spurred on by the high zinc prices of 2017.

Figure 14.6: Australian zinc production by state



Source: Company reports; Department of Innovation, Industry and Science (2019)

A few key operations have been integral to the surge. From January to September, production from Glencore's Lady Loretta and McArthur River mine increased by 33 per cent and 14 per cent respectively, equating to over 450,000 thousand tonnes of zinc in zinc concentrate. Meanwhile, MMG's Dugald River mine near Cloncurry in Queensland had a record third quarter in 2019, producing 47,296 tonnes of zinc in zinc concentrate, or 32 per cent above the previous quarter. 2019 production is estimated to be between 165,000 and 175,000 tonnes.

Over the next two years, production will be buoyed by a number of new projects, as well as robust output from Dugald River and the 300,000 tonnes per annum McArthur River mine. Production at New Century Resources revamped New Century mine has increased consistently this year, reaching 26,171 tonnes of zinc metal in the September quarter. By 2021, the project appears to be on track to produce 264,000 tonnes of zinc metal per annum.

Heron Resources Woodlawn zinc-copper project — which, like New Century, is based on recovering zinc from mineralised tailings — made its first shipment of zinc in October. At full capacity, the project aims to

recover 40,000 tonnes of zinc metal per year from reclaimed tailings, adding a sizeable amount to Australia's zinc production.

Refined production of zinc forecast to rise modestly over outlook period

Australia refines about 3.4 per cent of the world's zinc. In 2018, this amounted to 474 thousand tonnes of the metal. While only a fraction of the 5,891 thousand tonnes that China produced in the same period, it still puts Australia in the top ten zinc refiners in the world.

There are two zinc refiners in Australia: Nyrstar, which refines zinc at its Hobart refinery, and Korean-owned Sun Metals, which operates a smelter just outside of Townsville. In late 2018, Nyrstar was taken over by global commodity-trader, Trafigura, which has generally been taken as a positive sign for the future of the Hobart smelter. In late 2018, Sun Metals' announced plans to expand its zinc refinery from 225,000 tonnes per year to 270,000, with an anticipated completion date of 2021.

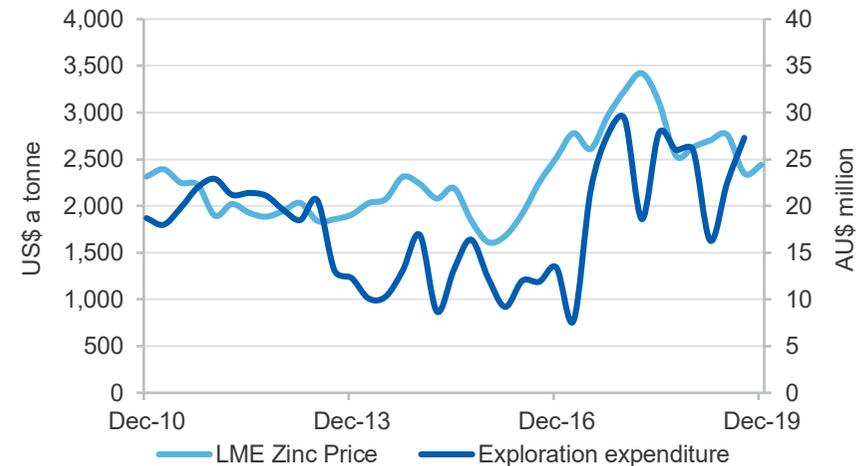
Refined zinc production has been flat or declining since 2001. In keeping with this trend, refined zinc production has been fairly steady over 2018–19 — an estimated 480 tonnes, or a 1.2 per cent rise on 2017–18. The Sun Metals expansion is expected to slightly increase refined production beyond 2021.

Exploration expenditure strong, but expected to soften

At \$27 million for the September quarter, silver, lead and zinc exploration spending was 22 per cent higher than in the preceding quarter and 5 per cent higher than this time last year (see Figure 14.7). Though the latest results represent a relatively high figure for silver, lead, and zinc spending (the ten year quarterly average is \$17 million), it is nonetheless only 3 per cent of Australia's total exploration expenditure.

Although zinc prices are expected to decline over the forecast period, they are still at historically high levels. With the Australian dollar forecast to remain relatively low over the next two years, it is therefore expected that exploration spending will remain strong over the outlook period.

Figure 14.7: Exploration expenditure on silver, lead, and zinc versus zinc prices



Source: London Metal Exchange (2019), ABS (2019) Mineral and Petroleum Exploration, Australia, 8412.0

Revisions to the outlook

The forecast for Australian zinc export earnings are broadly unchanged from the September 2019 *Resources and Energy Quarterly*.

Table 14.1: Zinc outlook

| World | Unit | 2018 | 2019 ^s | 2020 ^f | 2021 ^f | Annual percentage change | | |
|------------------------------------|--------|---------|-------------------|----------------------|----------------------|--------------------------|----------------------|----------------------|
| | | | | | | 2019 ^s | 2020 ^f | 2021 ^f |
| Production | | | | | | | | |
| – mine | kt | 12,685 | 12,880 | 13,816 | 13,966 | 1.5 | 7.3 | 1.1 |
| – refined | kt | 13,177 | 13,403 | 13,872 | 14,020 | 1.7 | 3.5 | 1.1 |
| Consumption | kt | 13,680 | 13,633 | 13,785 | 13,950 | -0.3 | 1.1 | 1.2 |
| Closing stocks | kt | 896 | 666 | 766 | 867 | -25.7 | 15.1 | 13.1 |
| – weeks of consumption | | 3 | 3 | 3 | 3 | -25.5 | 13.9 | 11.8 |
| Price | | | | | | | | |
| – nominal | US\$/t | 2,925 | 2,496 | 2,258 | 2,371 | -14.7 | -9.5 | 5.0 |
| | USc/lb | 133 | 113 | 102 | 108 | -14.7 | -9.5 | 5.0 |
| – real ^b | US\$/t | 2,976 | 2,496 | 2,211 | 2,275 | -16.1 | -11.4 | 2.9 |
| | USc/lb | 135 | 113 | 100 | 103 | -16.1 | -11.4 | 2.9 |
| Australia | Unit | 2017–18 | 2018–19 | 2019–20 ^f | 2020–21 ^f | 2018–19 | 2019–20 ^f | 2020–21 ^f |
| Mine output | kt | 949 | 1,235 | 1,346 | 1,384 | 30.2 | 9.0 | 2.9 |
| Refined output | kt | 474 | 480 | 475 | 477 | 1.2 | -0.9 | 0.3 |
| Export volume | | | | | | | | |
| – ore and concentrate ^c | kt | 1,738 | 2,095 | 2,381 | 2,455 | 20.6 | 13.7 | 3.1 |
| – refined | kt | 417 | 420 | 357 | 337 | 0.8 | -15.0 | -5.9 |
| – total metallic content | kt | 1,164 | 1,325 | 1,401 | 1,412 | 13.8 | 5.8 | 0.8 |
| Export value | | | | | | | | |
| – nominal | A\$m | 3,973 | 3,983 | 3,592 | 3,267 | 0.2 | -9.8 | -9.1 |
| – real ^d | A\$m | 4,109 | 4,052 | 3,592 | 3,206 | -1.4 | -11.4 | -10.7 |

Notes: **b** In 2019 US dollars; **c** Quantities refer to gross weight of all ores and concentrates; **d** In 2019–20 Australian dollars; **s** Estimate; **f** Forecasts

Source: ABS (2019) International Trade in Goods and Services, Australia, Cat. No. 5368.0; Company reports; Department of Industry, Innovation and Science; International Lead Zinc Study Group (2019); LME (2019); World Bureau of Metal Statistics (2019)