Aluminium
Resources and Energy Quarterly September 2018

Australia’s global ranking

1st Alumina exporter
1st Bauxite producer
2nd Alumina producer

3 stages of producing aluminium

1. Mining bauxite ore
2. Refining to recover alumina
3. Smelting to make aluminium

Key consumer markets for aluminium (tonnes)

1. Japan 2 million
2. China 32 million
3. Germany 2.2 million
4. South Korea 1.4 million
5. United States 5.8 million
6. India 1.2 million

Global uses of aluminium

28% Transport
23% Construction
13% Electrical
12% Packaging
10% Machinery
7% Consumer durables
7% Other

Major Australian alumina deposits (Gt)

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

Deposit
Operating mine
11.1 Summary
- Uncertainty in global aluminium supply chains is expected to drive prices up during 2018, to US$2,146 a tonne for aluminium and US$449 a tonne for alumina. Prices are then forecast to decline to US$2,092 a tonne for aluminium and US$354 a tonne for alumina by 2020.
- Australia’s aluminium and alumina exports are expected to be steady through to 2019–20, at 1.4 million tonnes and 18 million tonnes per annum respectively. Bauxite exports are forecast to increase from 30 million tonnes in 2017–18 to 32 million tonnes in 2019–20.
- Total Australian export earnings for aluminium, alumina and bauxite are forecast to decline from an estimated $14 billion in 2017–18 to $13 billion in 2019–20, reflecting a decline in prices.

11.2 Prices
Prices to remain high in 2018 due to supply uncertainty
Aluminium prices have eased after reaching a seven year high of US$2,603 (London Metal Exchange (LME) spot price) during the June quarter 2018. The spike in the aluminium price followed the US administration placing sanctions on major aluminium and alumina supplier, United Company Rusal, earlier in the year. While the sanctions have not been lifted, the US has given buyers an extended period to end contracts with Rusal and the opportunity for Oleg Deripaska — the major shareholder of Rusal and target of the sanctions — to divest and relinquish majority ownership of the company. A resolution between the company and US administration is expected to be forthcoming. In the September quarter, Aluminium prices have tracked back towards pre-sanctions levels.

The Free On Board (FOB) Australia alumina price reached a historical high of US$643 a tonne on 1 May 2018. Like aluminium, the alumina price has subsequently fallen back. The price has remained relatively high due to ongoing supply concerns, primarily in China, the curtailment of production at the Alunorte refinery in Brazil and workers striking at Alcoa’s Australian operations. The alumina price is forecast to be US$449 a tonne in 2018, and is expected to sustain aluminium prices at US$2,146 a tonne.

Prices to fall modestly in 2019 and 2020
The LME aluminium spot price and the FOB Australian alumina price are both estimated to fall from 2018 levels as supply concerns ease. The LME aluminium spot price is estimated to average US$2,093 a tonne in 2019 and US$2,092 a tonne in 2020. The FOB Australian alumina price is estimated to average US$363 a tonne in 2019 and $US354 a tonne in 2020 (Figure 11.1).

Despite the forecast declines, prices for 2019 and 2020 are still high relative to previous years, as capacity controls and restrictions on production due to air pollution concerns continue to keep the market tight in China — the world’s largest aluminium and alumina producer. The Chinese Government’s focus on reducing air pollution is expected to continue until at least 2020. The policy lowers the likelihood of aggressive capacity expansion in China.

Figure 11.1: World aluminium and alumina prices

11.3 Consumption

China driving global consumption

Despite some signs of softening global consumption, aluminium demand is expected to grow in 2018. Global consumption fell by 2.9 per cent year-on-year over the first half of 2018. The fall in consumption was primarily driven by a 2.5 per cent year-on-year fall in Chinese demand. China is the world’s largest consumer of aluminium, accounting for 54 per cent in 2017. China’s Purchasing Managers Index for the June quarter was down from March and year-on-year, a potential effect of escalating trade tensions.

The decline came despite a 2.6 per cent year-on-year rise in vehicle sales, a major use of aluminium, for the first seven months of 2018. In addition, investment in Chinese real estate expenditure remained strong through to July compared with the same period a year ago. Global aluminium consumption is forecast to grow by 2.7 per cent in 2018 to reach 61 million tonnes.

World alumina consumption decreased by 2.2 per cent year-on-year in the June quarter 2018, driven by decreased alumina consumption in China (down 3.3 per cent year-on-year). Declines in alumina consumption broadly matched aluminium production for the quarter. World alumina consumption is forecast to increase by 2.6 per cent to 115 million tonnes in 2018: a trend roughly in line with aluminium usage.

Aluminium and alumina demand expected to grow

Over the forecast period, world primary aluminium demand is projected to grow at an average annual rate of 2.4 per cent, to reach 64 million tonnes in 2020 (Figure 11.2). China’s aluminium consumption is expected to continue to grow firmly over the next two years (reaching 35 million tonnes in 2020), supported by strengthening residential and infrastructure construction.

A significant driver of aluminium demand is expected to come from automobiles, particularly energy-efficient vehicles with an increasing portion of aluminium components. China is expected to be a major driver of energy-efficient vehicle production, with a new energy vehicle (NEV) credit mandate taking effect in 2018. The mandate has a NEV target of 10 per cent of the passenger car market in 2019 and 12 per cent in 2020. Demand for automobiles is expected to remain strong through to 2020.

World alumina consumption is projected to grow at an average annual rate of 2.1 per cent, reaching 120 million tonnes in 2020 — in line with the average annual growth rate of aluminium production.

Figure 11.2: World aluminium consumption


11.4 Production

Tighter supply for aluminium and alumina in 2018

In early August, the Chinese central government announced that the winter production cuts implemented in 2017–18 would be repeated during 2018–19. As in 2017–18, operations in 28 cities will be targeted, with coal-fired aluminium and alumina plants required to cut production by 30 per cent over the winter. Producers implementing environmentally clean technology and already cutting production beyond requirements could be exempt or subject to lower cuts. As with the previous winter cuts,
production could be expected to front-load in the months before enforcement. Aluminium production for 2018 is expected to finish at 61 million tonnes.

Alumina production for the first seven months of 2018 has declined by 4.8 per cent year on year, driven by a 5.5 per cent reduction in Chinese production and an 18 per cent reduction in South American production. Lower output at the Alunorte alumina refinery in Brazil drove the reduction in South American production, with curtailment of production by 50 per cent since March 2018 for environmental reasons. The Brazilian refinery—the largest in the world, has announced that timing of a return to full capacity is uncertain, however could be achieved between October 2018 and mid-2019. In addition, some alumina refineries in China have reported limited availability of bauxite as a production constraint.

Alumina production is expected to reach 126 million tonnes for 2018. Risks to this estimate include the Chinese winter production cuts, the return of the Alunorte refinery to full capacity, and the pending resolution of US sanctions on United Company Rusal.

Global bauxite production increased by 9.2 per cent year on year in the first six months of 2018. The increase in production was driven by developments in Guinea, where production increased by 7.7 million tonnes, or 39 per cent year-on-year. This was partially offset by no Malaysian production occurring for the first half of 2018 due to a ban on bauxite mining by the Malaysian government. Over the same period in 2017, Malaysia had produced 3.4 million tonnes of bauxite. The ban, originally put in place for environmental considerations during early 2016, has been extended to the end of 2018. Global bauxite production is forecast to reach 331 million tonnes in 2018, an 8.4 per cent increase from 2017.

Environmental regulation in China to slow world aluminium/alumina output

Over the outlook period, growth in supply of world aluminium is expected to be slowed by China’s environmental policies. The Chinese government’s second round of winter production cuts demonstrate an ongoing commitment to curbing air pollution in major cities. Outside of China, new aluminium capacity is expected to come online during 2019 and 2020 primarily in Iran, Bahrain and India. World aluminium production is forecast to grow at a slower rate to reach 62 million tonnes in 2019 and 64 million tonnes in 2020 (Figure 11.3). There are two risks to this assessment. Firstly, the potential restart of idled aluminium capacity in the US as import tariffs take effect. Secondly, uncertainties regarding China’s curtailment policy will make supply more unpredictable over the outlook period. These uncertainties include the potential addition and restart of new and idled capacity in areas outside of the pollution-affected areas, and the scale of production curtailment exemptions granted to large state-owned corporations.

Figure 11.3: World aluminium, alumina and bauxite production

![Figure 11.3: World aluminium, alumina and bauxite production](image-url)

Source: International Aluminium Institute (2018); World Bureau of Metal Statistics (2018); Department of Industry, Innovation and Science (2018)

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Australia and Guinea to drive rising global bauxite output in 2019 and 2020

World bauxite production is forecast to grow at an average annual rate of 5.3 per cent to reach 357 million tonnes in 2019 and 367 million tonnes by 2020. The gains will be driven by new capacity coming online in Australia — notably the commissioning of Bauxite Hill and Amrun projects — and in Guinea. Guinea is currently the world’s third largest bauxite producer behind Australia and China, and could grow further given the scale of its untapped reserves.

11.4 Australia’s exports and production

A decline in export values to follow high values in 2017–18 and 2018–19

The value of Australia’s aluminium, alumina and bauxite exports finished at an 11-year high of $14 billion in 2017–18. The increase was driven by higher volumes of bauxite exports and higher export unit values for alumina and aluminium. Despite a 2.7 per cent decline in export volumes, stronger alumina prices saw alumina export earnings reach a historical high in 2017–18, at $8.5 billion.

After the high values of 2017–18, it is forecast that aluminium, alumina and bauxite export earnings will be maintained at $14 billion during 2018–19. This is expected to be driven by high alumina prices forecast for the first half of 2018–19. Export values are expected to decline in 2019–20 to $13 billion. This decline is due to an expected softening of prices for aluminium and alumina over the outlook period, which will be partially offset by increased export volumes of bauxite.

Environmental priorities are likely to remain an important influence on the Chinese aluminium, alumina and bauxite industries, with flow-on effects to Australian alumina and bauxite exporters. The Chinese government is committed to curbing air pollution in major Chinese cities, and is expected to close smelters and refineries which fail to meet new environmental regulations. While this is expected to tighten global aluminium and alumina supply, it will also reduce demand for Australian alumina and bauxite in the short term because they are inputs. A risk to this assessment is that global bauxite supply could tighten if the Malaysian bauxite mining ban remains in place, and Chinese pollution policies focus on bauxite mining. This presents a potential upside to Australia’s bauxite export earnings.

The majority (87 per cent) of Australia’s aluminium and alumina production is destined for export markets. Although there are emerging opportunities for Australia from the forecast high aluminium and alumina prices, exports are likely to be constrained by capacity limits and increased competition from low-cost producers in other nations. Australia is exempt from the US tariffs on aluminium imports, and so has an opportunity to expand sales into the US. In addition, Australian alumina exports into the US could rise if idle US aluminium capacity is restarted as a result of the impact of the tariffs.

Export earnings revised upwards

Total forecast earnings for aluminium, alumina and bauxite have been revised up in 2018–19 by $996 million from the June Resources and Energy Quarterly. The upwards revision largely reflects an improved outlook for alumina prices due to supply concerns, and to a smaller degree increased volumes of bauxite exports expected as new export-oriented projects come online over the outlook period.

Steady aluminium/alumina production, but moderate growth in bauxite production in 2017–18

Australia produced 1.6 million tonnes of primary aluminium in 2017–18, up 3.0 per cent from 2016–17. The increase is attributed to the return of full production to the Portland Aluminium smelter, where production was cut during December 2016 due to a power outage (Figure 11.4). Alumina production during 2017–18 was 20 million tonnes, a 1.6 per cent decline from 2016–17 (Figure 11.5).

Australia’s bauxite production was 94 million tonnes in 2017–18, an increase of 11 per cent from 2016–17 (Figure 11.6). A new bauxite mining operation, Metro Hills, began production in north Queensland in April 2018, with an initial planned annual output of two million tonnes, rising to six million tonnes per annum in the next three years.
New capacity to contribute to strong growth in bauxite production

With no planned expansions to smelter or refinery capacity in the short-term, Australian output is forecast to remain at 1.6 million tonnes per annum for aluminium and 20 million tonnes for alumina in 2018–19 and 2019–20. Australia’s bauxite production is projected to grow at an annual average rate of 8.3 per cent, to 108 million tonnes in 2019–20.

Figure 11.4: Australia’s aluminium exports and production

The strong growth is due to the Bauxite Hills mine increasing production towards full capacity and the commencement of Rio Tinto’s Amrun project in early 2019. Another potential addition to Australia’s bauxite production is in Queensland at Metallica Minerals’ Urquhart mine. The company obtained a mining lease from the Queensland Government in early 2018, and mining is pending final approvals and the completion of infrastructure.

A potential risk to the outlook in 2018–19 is the ongoing industrial action at Alcoa Australia’s alumina and bauxite operations. A worker’s strike began in early August 2018 and was ongoing at the time of writing. The company announced that alumina production had been cut by about 15,000 tonnes over August as a result.

Figure 11.5: Australia’s alumina exports and production


Figure 11.6: Australia’s bauxite exports and production

Table 11.1: Aluminium, alumina and bauxite outlook

<table>
<thead>
<tr>
<th>World</th>
<th>Unit</th>
<th>2017</th>
<th>2018(^f)</th>
<th>2019(^f)</th>
<th>2020(^f)</th>
<th>Annual percentage change</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2018(^f)</td>
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<tr>
<td><strong>Primary aluminium</strong></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Production</td>
<td>kt</td>
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<td>60,909</td>
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<td>60,858</td>
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<td>63,800</td>
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<td>Closing stocks(^b)</td>
<td>kt</td>
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<td>– weeks of consumption</td>
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<td>2.0</td>
<td>1.8</td>
<td>1.7</td>
<td>2.1</td>
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<td><strong>Prices aluminium(^c)</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>– nominal</td>
<td>US$/t</td>
<td>1,969</td>
<td>2,146</td>
<td>2,093</td>
<td>2,092</td>
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<tr>
<td>– real(^d)</td>
<td>US$/t</td>
<td>89.3</td>
<td>97.3</td>
<td>94.9</td>
<td>94.9</td>
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<tr>
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<td>449.1</td>
<td>362.8</td>
<td>353.8</td>
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<td>US$/t</td>
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<td>342.1</td>
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<tr>
<td>Primary aluminium</td>
<td>kt</td>
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<td>1,564</td>
<td>1,569</td>
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<td>20,307</td>
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<td>Bauxite</td>
<td>Mt</td>
<td>84.9</td>
<td>94.2</td>
<td>101.6</td>
<td>107.8</td>
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<td>188</td>
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<tr>
<td>Primary aluminium</td>
<td>kt</td>
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<td>1,381</td>
<td>1,381</td>
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<td>3,798</td>
<td>3,682</td>
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<td>4,102</td>
<td>3,798</td>
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<td>17,389</td>
<td>17,511</td>
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<td>9,094</td>
<td>7,980</td>
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<td>8,733</td>
<td>9,094</td>
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<td>14,203</td>
<td>12,680</td>
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Notes: \(b\) Producer and LME stocks; \(c\) LME cash prices for primary aluminium; \(d\) In 2018 calendar year US dollars; \(e\) In 2018-19 financial year Australian dollars; \(f\) Forecast; Source: ABS (2018) International Trade in Goods and Services, 5368.0; AME Group (2018); LME (2018); Department of Industry, Innovation and Science (2018); International Aluminium Institute (2018); World Bureau of Metal Statistics (2018)