

Aluminium, alumina and bauxite

Resources and Energy Quarterly September 2017

Australia's global ranking



Alumina exporter



Bauxite producer

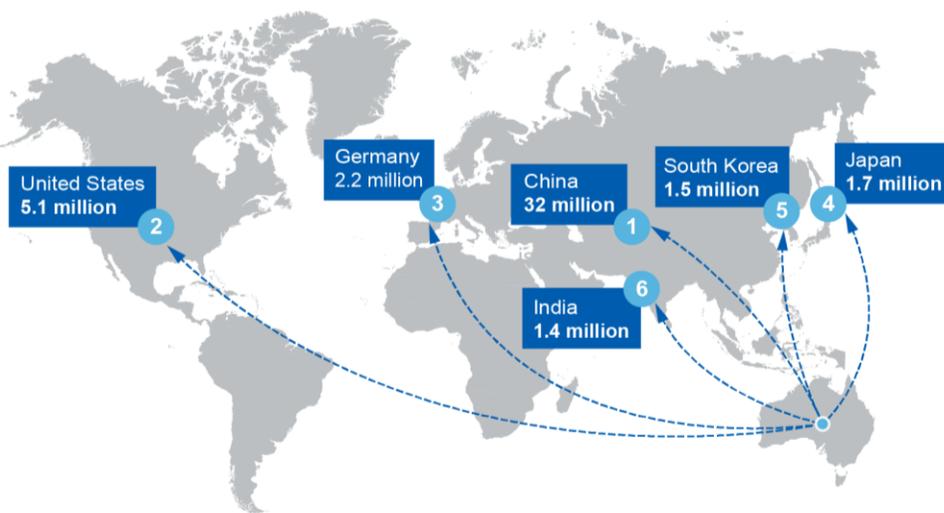


Alumina producer

3 stages of producing aluminium



Key consumer markets for aluminium (tonnes)

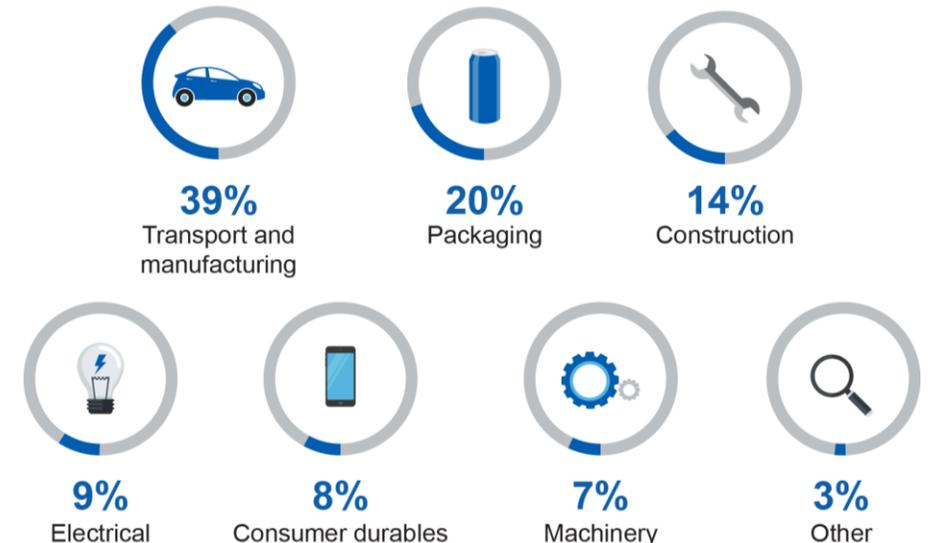


Major Australian alumina deposits (Gt)

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



Global uses of aluminium



Aluminium

Summary

- The value of Australia's aluminium exports is forecast to increase from \$3.2 billion in 2016–17 to \$3.8 billion in 2017–18, with prices and volumes growing.
- Aluminium prices are forecast to rise until early 2018, driven by production cuts in China.
- With a return to pre-outage production levels at Portland Aluminium, Australia's aluminium production is forecast to recover to normal capacity of 1.6 million tonnes in 2017–18.

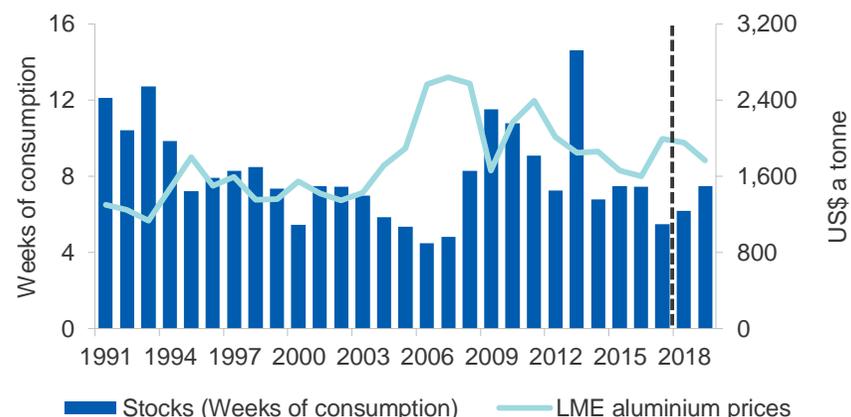
Prices

The average London Metal Exchange (LME) spot aluminium price increased by 21 per cent year-on-year in the first eight months of 2017, to US\$1,902 a tonne. The daily spot LME price also reached a 56-month high on 31 August 2017. Driving the rise in prices was a significant production capacity cut in China, following the government's crackdown on illegal aluminium capacity. The price increase has been further escalated by the Chinese Government's request to cut production over the 2017–18 winter period, in order to address air pollution: this is expected to see Chinese output fall by 30 per cent. The global aluminium market balance (production less consumption) was in deficit in the June quarter, which also contributed to higher prices.

Likely reflecting the Chinese production cuts, LME stocks decreased by 36 per cent from the beginning of the year, reaching around 1.4 million tonnes in late June 2017. This trend of lower production growth and declining stocks is expected to continue over the remainder of 2017, placing upward pressure on aluminium prices.

For the year as a whole, aluminium prices are estimated to increase by 24 per cent from the 2016 level, averaging US\$1,995 a tonne. The global aluminium market is forecast to be in deficit by around 2 million tonnes in 2017. World inventories of aluminium are forecast to decline by 30 per cent, to 6 million tonnes — or around 5.2 weeks of consumption. As the world's largest aluminium producer, China's production curtailments are expected to continue driving

Figure 11.1: Aluminium prices and stocks



Source: LME (2017) spot prices; Department of Industry, Innovation and Science (2017)

aluminium prices higher for the remainder of 2017 and potentially into 2018. However, upside momentum is likely to be limited by the impact of new capacity starts, which is estimated to be around 4.4 million tonnes in 2017. Production in other Asian nations and the Middle East countries is also forecast to rise by 21 and 2.3 per cent, respectively.

Average LME spot aluminium prices are forecast to decline by 1.9 per cent in 2018 and by 9.8 per cent in 2019, to US\$1,957 a tonne and US\$1,766 a tonne, respectively. The forecast is based on the assumption that Beijing's 'air pollution control' policy — which requires Chinese aluminium smelters to cut production by 30 per cent during the winter period — will not be extended beyond 2017–18. This will depend on how quickly the industry can cut emissions near heavily populated cities.

Prices may also be constrained by increased supply from new low-cost capacity additions in China, India, Vietnam and Russia. 'Committed' and 'probable' new and expansion projects are expected to add 3.2 million tonnes per annum in China, 330,000 tonnes in India, 300,000 tonnes in Vietnam, and 150,000 tonnes in Russia in 2018.

Consumption

World aluminium consumption to remain strong

World aluminium consumption increased by 4.8 per cent year-on-year in the June quarter 2017, to over 15 million tonnes, propelled by increases in vehicle sales in Japan, and increased fixed asset investment (FAI) in China. Over this period, Japan's vehicle sales rose by 12 per cent, driven by strong domestic and overseas demand for new models. In China, the sustained growth (average 8 per cent a year) in the FAI — machinery, land, buildings, vehicles, and technology — underpinned aluminium demand.

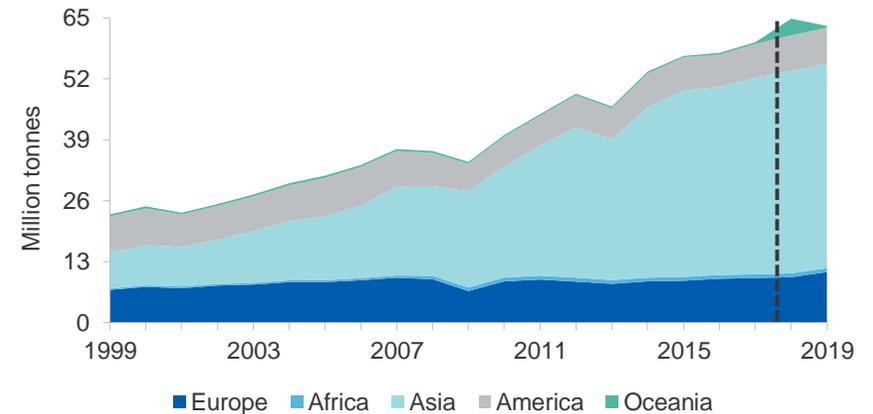
Global industrial production — a significant driver of commodity demand — is forecast to increase by 3.3 per cent in 2017. As a result, world aluminium consumption is forecast to grow by 3.3 per cent in 2017 to 60 million tonnes. Vehicle demand remains key to Chinese demand for aluminium, with car sales growing by 4.6 per cent over the year to July. This follows declines in April and May. The vehicle tax rate was increased to 7.5 per cent in 2017, and is scheduled to rise to 10 per cent by the start of 2018. Chinese consumers may seek to buy before the tax will hike to 10 per cent in January 2018.

Transport and housing sectors to drive future aluminium consumption

World aluminium consumption is forecast to rise at an average annual rate of 2.8 per cent over the next two years, to 62 million tonnes in 2018 and 63 million tonnes in 2019. Consumption growth is likely to track trends in global industrial production, which is forecast to grow by almost 3 per cent in 2018 and in 2019. The global transport sector and the Chinese housing sector are projected to be key drivers of growth in aluminium usage. Increased vehicle sales and higher aluminium intensity in vehicle production will drive the rise in transport demand.

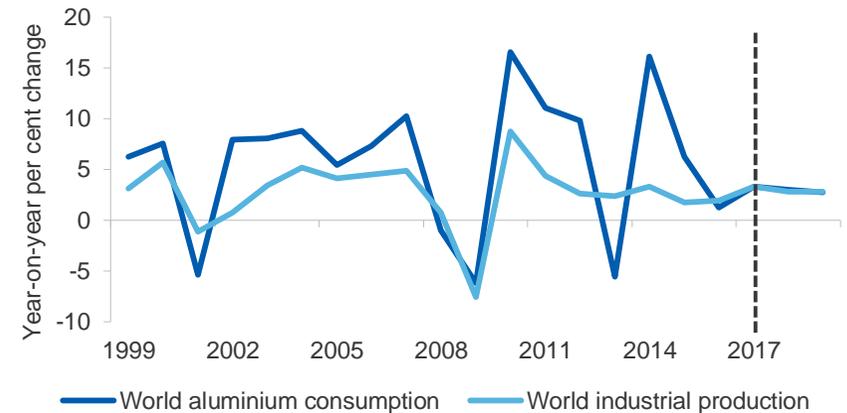
Global vehicle sales are expected to increase by 4 per cent and 3.2 per cent in 2018 and 2019, respectively, led by rises in vehicle sales in some Developed and Emerging automotive markets (such as North America, China, and Latin America). In China, growth in vehicle sales is estimated to fall from the double-digit growth rate recorded in 2016. Aluminium consumption in the European vehicle industry is expected to increase, as the commission of the 200,000 tonnes per year Hydro Aluminium's automotive aluminium sheet facility in Germany in July

Figure 11.2: World aluminium consumption



Source: World Bureau of Metal Statistics (2017); Department of Industry, Innovation and Science (2017)

Figure 11.3: Aluminium usage and industrial production, growth



Source: CPD Netherlands Bureau for Economic Policy Analysis; Department of Industry, Innovation and Science (2017); World Bureau of Metal Statistics (2017)

2017 will support higher demand for aluminium. Aluminium demand from North America is expected to grow at an annual average rate of over 3 per cent over the next few years, to 7.5 million tonnes in 2019, buoyed by stronger motor vehicle production. Latin America is expected to be the fastest growing regional automotive market in the world. This is partly due to more stable currencies in Brazil and Argentina, and partly to stronger economic growth in other Latin American countries.

Global automotive makers are increasingly using aluminium to reduce vehicle weights and curb emissions. According to the International Aluminium Institute, aluminium content per vehicle is expected to account for 16 per cent (or 565 pounds) of curb weight by 2028. This represents a rise of 42 per cent over the past 13 years.

In China, investment in machinery, land, buildings, vehicles and technology is expected to grow by at least 8 per cent year-on-year, contributing to higher aluminium consumption in that nation .

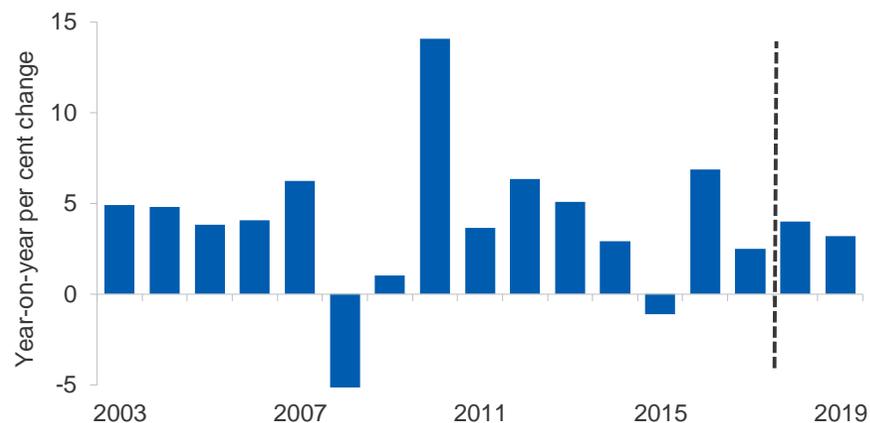
Production

New capacity should offset China's production cuts

World aluminium production increased by 5.8 per cent year-on-year in the first eight months of 2017, to over 40 million tonnes. This was driven by strong growth in China (7.7 per cent year-on-year), ex-China Asian countries (14 per cent year-on-year), and South America (3 per cent year-on-year). Over this period, production in Oceania fell by 11 per cent year-on-year, due to reduced capacity at Portland Aluminium in Australia (following a power outage in December 2016). Crackdowns on air pollution and illegal capacity are expected to reduce China's aluminium production by 4.3 per cent in 2017 to 30 million tonnes. However, offsetting China's production cut are expected rises in other Asian countries (up 21 per cent) and the Middle East (up 2.3 per cent). As a result, world aluminium production is forecast to fall by just 0.3 per cent in 2017 to 58 million tonnes.

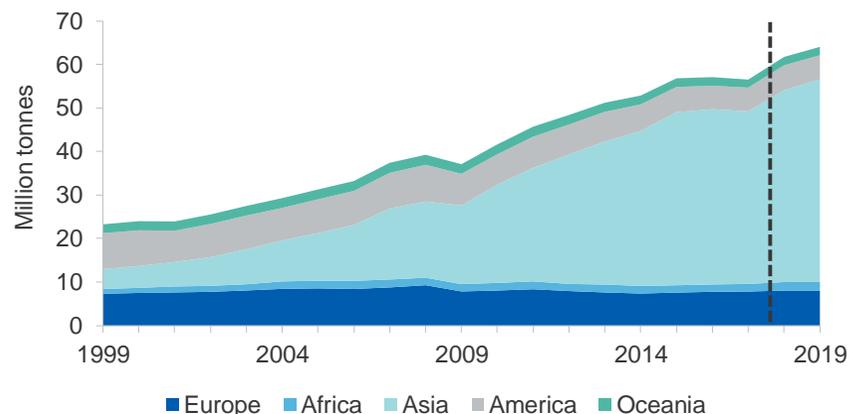
Global aluminium production is projected to resume growing in 2018 and 2019. Output should reach 65 million tonnes by 2019, driven by increased capacity in China and other Asian countries. A forecast increase in aluminium prices in 2017 will encourage some idle plants to restart, while, in China, existing and new capacities that have been closed by regulators will be allowed to reopen after the 2017–18 winter season.

Figure 11.4: Growth in global vehicle sales



Source: *Business Monitor International (2017); Department of Industry, Innovation and Science (2017)*

Figure 11.5: World aluminium production



Source: *International Aluminium Institute (2017); Department of Industry, Innovation and Science (2017)*

In July 2017, Alcoa Corporation announced plans to restart three of five potlines at its Warrick aluminium smelter in Indiana. The process to restart the three lines— with over 161,000 tonnes of annual capacity— started two months ago, and is expected to be completed in the second half of 2017. This brings to an end a decade of closures, which have reduced production from the 2008 peak of 2.7 million tonnes.

In India, Vedanta announced plans to increase its aluminium production by 50 per cent over the coming two years, to 2.3 million tonnes by 2019. India’s National Aluminium Company (Nalco) also announced the expansion of the 500,000 tonnes per annum Angul smelter project in Odisha.

China’s winter and illegal capacity cut policies

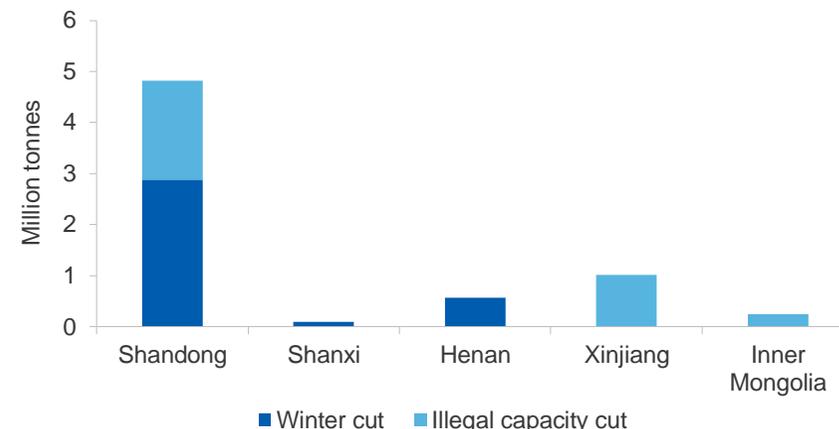
The total production cut from the winter curtailment and illegal aluminium capacity policies is estimated to be around 7 million tonnes in 2017, of which, Shandong Province is expected to account for 70 per cent (or 4.8 million tonnes). China Hongqiao Group, the world’s largest aluminium producer, removed 3.2 million tonnes of illegal smelting capacity in Shandong province in July 2017. Another 3.8 million tonnes of operating capacity is expected to be cut by year’s end.

Chinese aluminium producers have tried to compensate for the winter production cut by increasing output in 2017. Production in the first half of 2017 increased by 11 per cent year-on-year, to nearly 17 million tonnes. China is forecast to add 4.4 million tonnes of new capacity in 2017. This new addition will be a challenge to the Chinese authorities’ attempt to remove excess capacity.

Similar policies in the past have not succeeded in curbing excess capacity. In 2015, ‘supply-side reform’ failed to achieve production cuts. In fact, China’s aluminium production rose by 12 per cent in 2015 to nearly 32 million tonnes, and remained at this level in 2016.

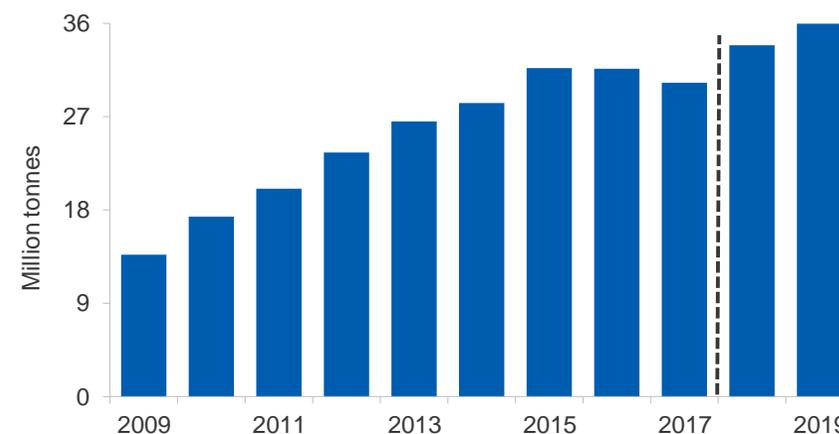
Looking beyond 2017, Chinese aluminium smelters will ramp up production after the 2017–18 winter season (April to September 2018). As a result, aluminium production in China is forecast to increase by 12 and 6 per cent in 2018 and 2019, to 34 and 36 million tonnes, respectively.

Figure 11.6: Production cuts in China in 2017



Source: Macquarie Research (2017)

Figure 11.7: China’s aluminium production



Source: International Aluminium Institute (2017); Department of Industry, Innovation and Science (2017)

Australia's exports and production

Aluminium exports lower in 2016–17 due to reduced capacity

In 2016–17, Australia exported \$3.2 billion worth of primary aluminium. This was 2.6 per cent lower than 2015–16, with higher aluminium prices only partly offsetting lower volumes. Export volumes decreased by 7.9 per cent to 1.3 million tonnes, due to reduced production capacity from Portland smelter.

Aluminium exports to rise strongly in 2017–18

Australia's primary aluminium exports are estimated to increase by 21 per cent in 2017–18 to \$3.8 billion, driven by expected high aluminium prices. The average London Metal Exchange (LME) spot aluminium price reached a 3 year high in August 2017, at US\$1,986 a tonne, and is expected to remain at or above this level during the first three quarters of 2017–18. Export volumes are estimated to return to the normal annual export capacity level of 1.4 million tonnes, supported by the expected return to full production at Portland Aluminium.

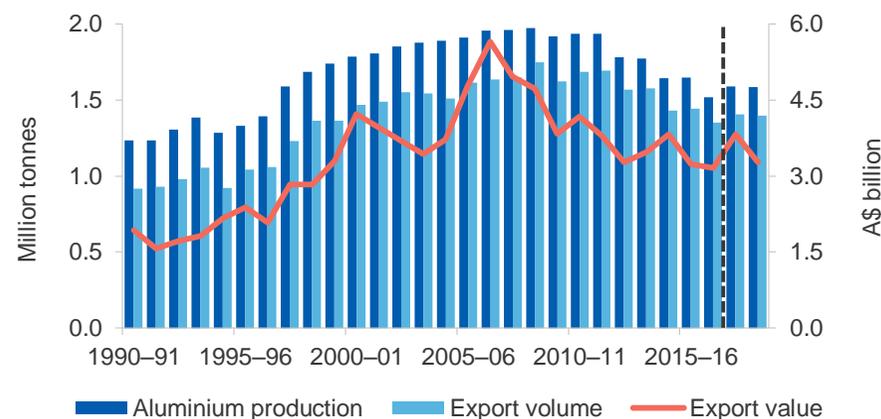
Nevertheless, Australia's primary aluminium exports are forecast to fall by 15 per cent in 2018–19 to \$3.3 billion, due to an expected drop in aluminium prices. Notwithstanding the winter 2017–18 production cut in China, the global aluminium market is expected to be in surplus supply, and this surplus will lower aluminium prices. Export volumes are forecast to be stable, at 1.4 million tonnes.

Aluminium production to increase in 2017–18 as Portland Aluminium's production to recover

Australia produced 1.5 million tonnes of primary aluminium in 2016–17, 7.9 per cent down from the previous financial year. The decline in production was the result of reduced capacity at Australia's third largest aluminium smelter, Portland Aluminium, following a power outage in December 2016. Over this period, Portland's output declined by 35 per cent to 191,000 tonnes. Also contributing to the fall in aluminium production was the decision by Rio Tinto to reduce output at the Boyne Island smelter, in response to higher power prices. In 2016–17, Boyne Island's production fell by 5.5 per cent to 552,000 tonnes.

However, offsetting Portland and Boyne Island output loss and production cut is a slight increase (0.8 per cent) in Tomago's aluminium production, to 591,000 tonnes.

Figure 11.8: Australia's aluminium exports and production



Source: ABS (2017) *International Trade in Goods and Services*, 5368.0; Department of Industry, Innovation and Science (2017)

Australia's aluminium production is estimated to increase by 4.8 per cent in 2017–18 to around 1.6 million tonnes. The growth will be propelled by Portland Aluminium's expected return to pre-outage production levels of around 300,000 tonnes in 2017–18. In 2018–19, aluminium production is forecast to remain stable, with no major additions or closures to capacity.

Production costs remain a challenge

Production costs have been an ongoing concern for Australian aluminium smelters, and will remain a challenge for years to come—the driving force has been rising power prices. Aluminium smelter cash costs are forecast to rise over the next few years. Given the estimated average LME aluminium prices of US\$1,995 and US\$1,957 a tonne in 2018 and 2019, Australian aluminium smelters will be operating at a loss.

Alumina

Summary

- The value of Australia's alumina exports is forecast to increase from \$6.7 billion in 2016–17 to \$7.8 billion in 2017–18, driven by higher prices.
- Alumina prices are forecast to rise until early 2018, on the back of production cuts in China.
- Australia's alumina production is forecast to be steady, at 21 million tonnes, with no planned closures/expansions or major disruptions at existing operations.

Prices

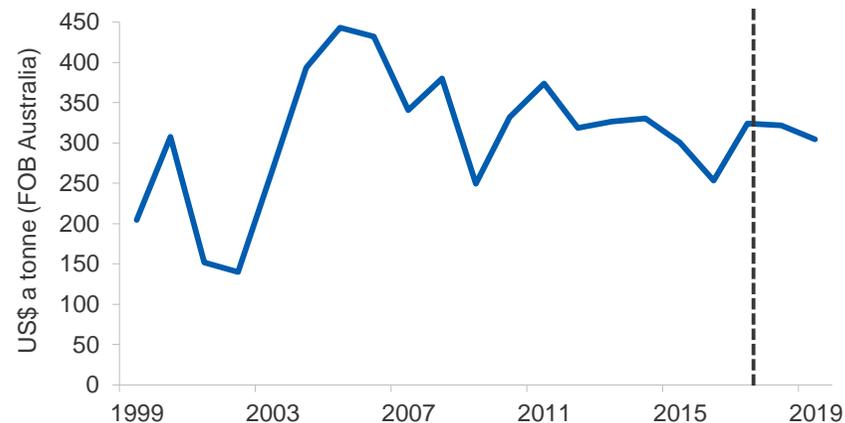
Alumina prices forecast to grow strongly in 2017, but come under pressure in 2018 and 2019

The average FOB Australia alumina price increased by 37 per cent year-on-year in the first eight months of 2017 to average US\$316 a tonne, driven by Chinese production cuts. Refineries have been asked to cut production by 30 per cent during the 2017–18 winter season, and an illegal capacity investigation is under way. Chinese aluminium smelters have ramped up aluminium production ahead of the winter curtailment. In the June quarter 2017, rising world aluminium production boosted alumina demand—aluminium production increased by 6.3 per cent year-on-year.

Despite the production curtailment in China, global aluminium production is expected to fall by just 0.3 per cent in 2017, thanks to new capacity addition from major aluminium producers. This reduction in aluminium production is expected to have little impact on alumina demand for the remainder of 2017. As a result, the average FOB Australia alumina price is estimated to rise by 28 per cent in 2017, to average \$US324 a tonne.

Further out, FOB Australia alumina prices are forecast to come under pressure, falling by 0.6 per cent and 5.4 per cent in 2018 and 2019, to \$US322 a tonne and \$US305 a tonne, respectively. New capacity additions in China and other major producing countries are expected to put downward pressure on prices. It is projected that China will add over 6.8 million tonnes of refinery capacity in 2018, from greenfield and

Figure 11.9: Alumina price



Source: Bloomberg (2017) alumina monthly price; Department of Industry, Innovation and Science (2017)

expansion projects. In particular, industrial heavyweights Shandong and Shanxi are forecast to add 2 million tonnes and 1.8 million tonnes per annum, respectively, to the country's alumina capacity by 2018. Outside of China, India and the UAE are projected to add another 3 million tonnes of new refinery capacity in 2018.

Consumption

Growth in alumina consumption in line with aluminium production growth

World alumina consumption increased by 6.3 per cent year-on-year in the June quarter 2017, to over 29 million tonnes, driven by strong growth in aluminium production. In China — the world's largest alumina consumer — alumina consumption increased by 7.5 per cent year-on-year, to 16 million tonnes, in line with the rise in China's aluminium production.

Alumina demand from China is estimated to fall in the fourth quarter of 2017, as the winter production curtailment comes into effect. However, offsetting the drop in Chinese demand is an expected rise in consumption from the North American region.

In the US, Alcoa Corporation is expected to restart three of five potlines— with over 161,000 thousand tonnes of annual capacity— at its Warrick aluminium smelter in the second half of 2017. These potlines will require around 320,000 tonnes of alumina a year. For 2017 as a whole, global alumina consumption is estimated to be unchanged from the 2016 level, at 110 million tonnes.

Alumina demand is driven by aluminium production. Over the next two years, global aluminium production is forecast to grow at an annual average rate of 6 per cent, driven by the addition of new capacity in China, the Middle East, and the US. In China, following the winter production curtailment, aluminium production is expected to escalate, rising by at least 12 per cent a year in 2018 and 2019. In the Middle East, Iran’s aluminium production is forecast to rise by 46 per cent in 2018, driven by a production increase at the Al-Mahdi and Hormazal aluminium smelters. In the US, rising aluminium prices have provided aluminium smelters with the confidence restart idle capacity. As a result, global demand for alumina is forecast to increase by about 6 per cent a year (in line with aluminium production growth), to 123 million tonnes.

Production

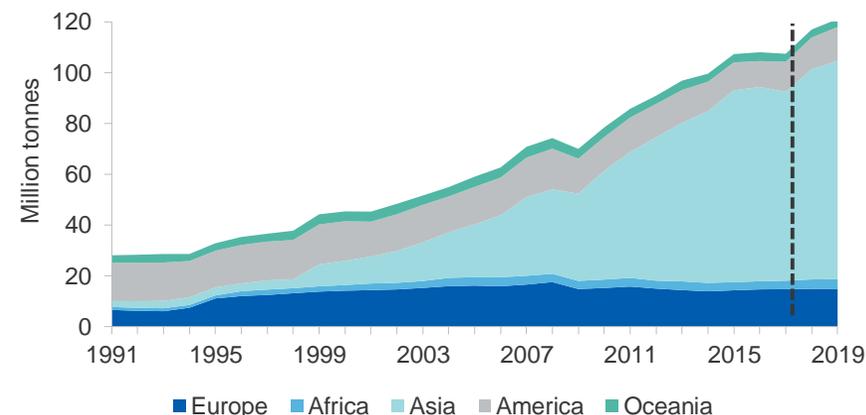
Alumina production to fall in 2017, but return to growth in 2018 and 2019

World alumina production increased by 15 per cent year-on-year in the first eight months of 2017, to 86 million tonnes. This was driven by strong growth in China (up 27 per cent year-on-year), and African and other Asian countries (up 40 per cent year-on-year). The rise in Chinese production reflected Chinese refineries’ strategy to maximise output ahead of production cuts in the 2017–18 winter season. Outside of China, the 650,000 per annum Nhan Co refinery in Vietnam started production in December 2016, and the plant has continued to ramp-up through the first half of 2017.

For 2017 as a whole, global alumina production is forecast to fall by 0.7 per cent to 114 million tonnes, largely due to production cuts in China. This fall is smaller than expected in the June 2017 *Resources and Energy Quarterly*; Chinese refiners have responded to higher prices by building stocks.

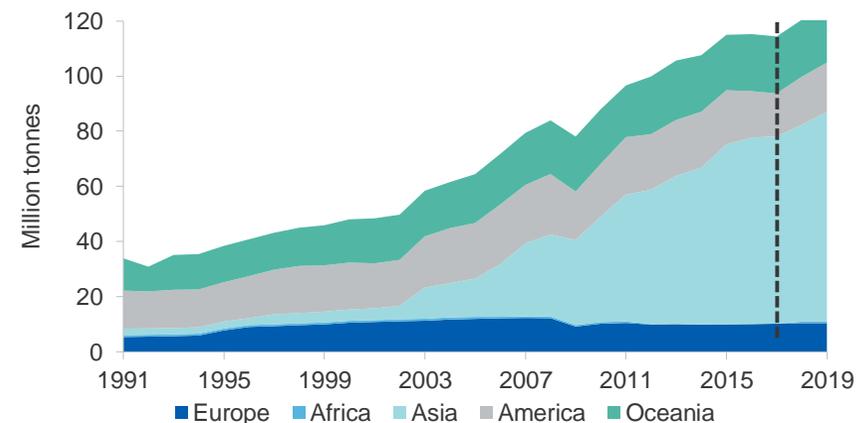
In 2018 and 2019, world alumina production is projected to resume growing, at an annual rate of 5 per cent, to reach 125 million tonnes by 2019. The gains will be driven by a return to production growth in China.

Figure 11.10: World alumina consumption



Source: AME Group (2017); Department of Industry, Innovation and Science (2017); World Bureau of Metals Statistics (2017)

Figure 11.11: World alumina production



Source: International Aluminium Institute (2017); Department of Industry, Innovation and Science (2017)

It is possible that the Chinese production cuts will be a one-off, with no further extension beyond 2017. For this reason, China's alumina production is forecast to increase by 2 and 3.6 per cent in 2018 and 2019, to 61 million and 63 million tonnes, respectively.

Outside of China, India's production is forecast to increase by 8.5 per cent in 2018, and by 2.6 per cent in 2019, supported by a 14 per cent rise in production at the Lanjigarh Mettur Alumina refinery. The Ma'aden Ala Refinery in Saudi Arabia will reach full production capacity of 1.8 million tonnes in 2018, up 20 per cent from 2016. The Al Taweelah Alumina project in the United Arab Emirates is expected to commence operation in late 2018 or early 2019, with start-up capacity of 1.5 million tonnes.

China's winter cut policies

Chinese alumina refiners are facing less scrutiny than aluminium smelters. The total cut from the winter curtailment policy is estimated to be around 9.3 million tonnes of alumina — a 25 per cent cut in operating capacity. The cut will be focused on the Shandong province (accounting for 61 per cent), and Henan province (38 per cent), as these provinces have a bigger share in national alumina production than in aluminium production.

Australia's exports and production

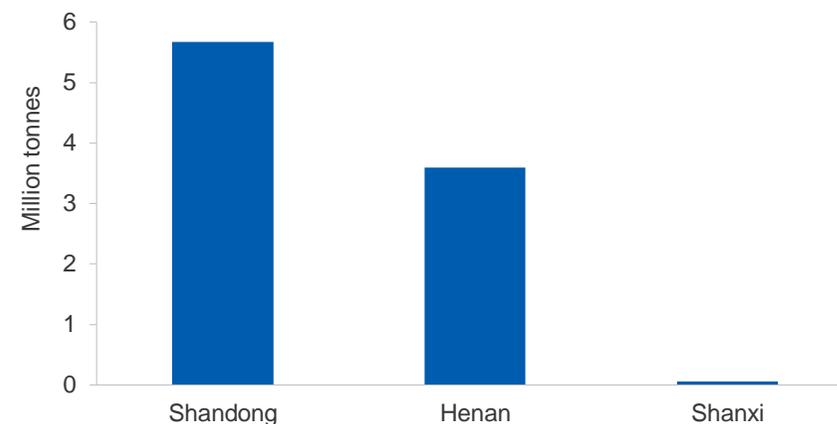
Alumina exports higher in 2016–17, driven by higher prices and volumes

Australia exported \$6.7 billion worth of alumina in 2016–17. This was 11 per cent higher than in 2015–16, with growth driven by higher alumina prices and volumes. Export volumes increased by 3.1 per cent, to over 18 million tonnes. Over this period, alumina prices rose by 15 per cent, to average US\$296 a tonne.

Alumina exports to rise strongly in 2017–18, but fall modestly in 2018–19

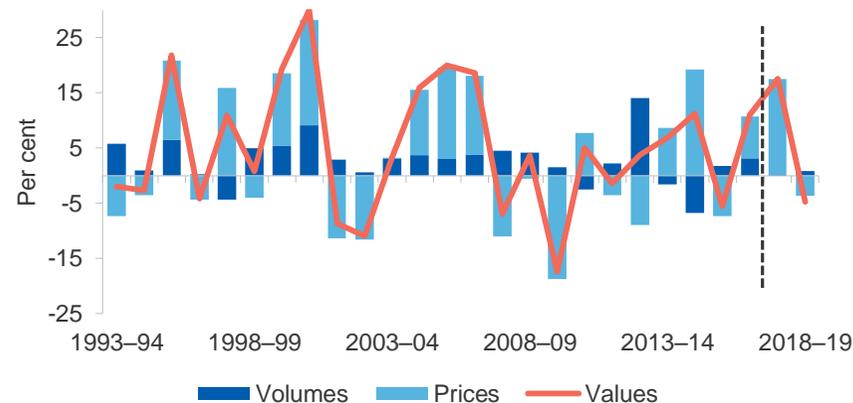
Australia's alumina exports are estimated to increase by 18 per cent in 2017–18 to \$7.8 billion, driven by expected gains in alumina prices. The average FOB Australia alumina price increased by 28 per cent year-on-year in July 2017, to US\$308 a tonne, and is forecast to remain at or above this level for the next six months. The production curtailment in China is the main catalyst for the expected increase in prices.

Figure 11.12: Production cuts in China in 2017



Source: Macquarie Research (2017)

Figure 11.13: Annual growth in Australia's alumina export values, contributions from prices and export volumes



Source: ABS (2017) *International Trade in Goods and Services*, 5368.0; Department of Industry, Innovation and Science (2017)

Since the June 2017 *Resources and Energy Quarterly*, the value of Australia's alumina export earnings for 2017–18 has been revised up by \$1.8 billion (28 per cent) to \$7.8 billion. The upward revision primarily reflects a stronger than expected rise in alumina prices in the first seven months of 2017.

Australia's alumina exports are forecast to fall by 4.7 per cent in 2018–19 to \$7.5 billion (in 2017–18 dollars), due to an expected drop in alumina prices. Following the winter 2017–18 production cut in China, the global alumina market is expected to be in surplus, thus putting downward pressure on aluminium prices. Export volumes are forecast to remain stable, at around 18 million tonnes.

There is an emerging bauxite quality issue in China that will have implications for Chinese refineries' usage of imported bauxite and alumina. As the world's second largest producer and largest exporter of alumina, Australia has capacity to respond to this opportunity.

Australia's alumina production to remain steady

Australia produced 21 million tonnes of alumina in 2016–17, down by just 0.2 per cent from the previous financial year. The slight decline in production was the result of reduced output from Rio Tinto's Queensland Alumina Limited (QAL) refineries. Cyclone Debbie hit the northern Queensland region at the end of March, disrupting the operation of QAL for a number of days.

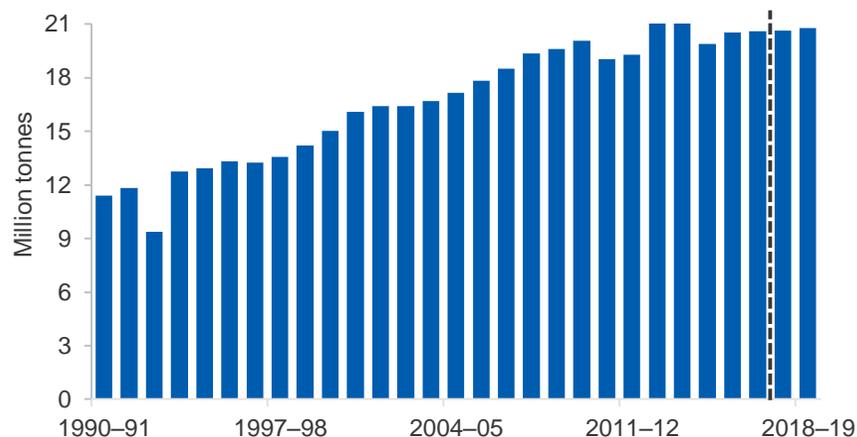
For 2017–18 and 2018–19, Australia's aluminium production is forecast to remain steady, at 21 million tonnes, with no planned closures/expansions or major disruptions expected at existing operations.

Risks to Australia's alumina exports and production

Australia's alumina exports are likely to be constrained by production capacity limits, with no major additions scheduled until 2018–19. Australia exports more than 88 per cent of its alumina production; the rest is used domestically.

Competition from other alumina producers and exporters is expected to intensify, as new capacity additions from China and else where continue to come online: an estimated of 19 million tonnes a year of additional capacity is expected.

Figure 11.14: Australia's alumina production



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

China's debt reduction strategy and the reduction in excess capacity and closure of inefficient state-owned enterprises, is likely to have a direct impact on the country's economic growth. Slower growth in China will impact commodity exporters like Australia. As a result, the International Monetary Fund (IMF) has recently asked commodity exporting countries to 'adjust to lower revenue'.

Bauxite

Summary

- The value of Australia's bauxite exports is forecast to increase from \$1.0 billion in 2016–17 to \$1.1 billion in 2018–19, driven by higher volumes.
- Australia's bauxite production is forecast to reach 94 million tonnes in 2018–19, with the Bauxite Hills and Amrun projects due online in the next two years.
- Regulatory changes in China and an increase in illegal mining in Malaysia, are short-term challenges to Australia's bauxite exports.

Production

World bauxite production to rise strongly in 2018 and 2019

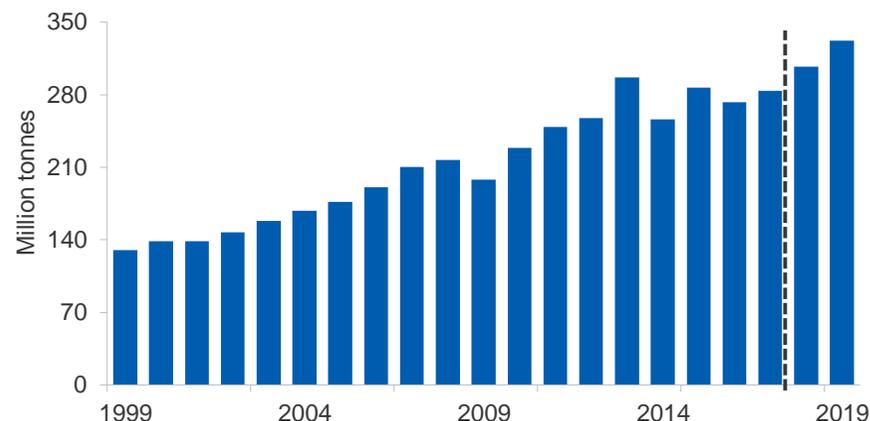
World bauxite production increased by 9.3 per cent year-on-year to 74 million tonnes, as production in Australia — the world's largest bauxite producer — rose by 5.1 per cent to 22 million tonnes. Over this period, production in Africa rose by 51 per cent year-on-year, to 11 million tonnes. Production in China, the world's second largest bauxite producer, was unchanged at 15 million tonnes.

For 2017 as a whole, Chinese bauxite production is forecast to fall by 10 per cent to around 58 million tonnes, due to curtailed alumina production in the 2017–18 winter season. Offsetting the fall in Chinese production is an expected rise in Australia's bauxite output (with an estimated increase of 1.7 per cent), Guinea (up 38 per cent), and South America (up 11 per cent). As a result, world bauxite production is forecast to rise by 4 per cent to around 283 million tonnes.

India's bauxite production is estimated to increase from 22 million tonnes in 2016 to 26 million tonnes in 2017, driven by an increase in the domestic demand for aluminium. The country has 3,100 million tonnes of bauxites (or about 5 per cent of the world's bauxite resources). To encourage bauxite development, the Ministry of Mines recently increased the lease area for mining of bauxite from 10 to 50 square kilometres in the Indian State of Odisha.

World bauxite production is forecast to rise by 8 per cent in 2018 and 2019, to 306 and 331 million tonnes, respectively, primarily driven by

Figure 11.15: World bauxite production



Source: World Bureau of Metal Statistics (2017); Department of Industry, Innovation and Science (2017)

new capacity additions in Australia. With the addition of Metro Mining's Bauxite Hills project in 2018, and Rio Tinto's Amrun project in 2019, Australian bauxite output is forecast to increase at annual rate of at least 6 per cent, to 92 million tonnes by 2018–19.

Other contributors to increased global bauxite production include Guinea, Malaysia and Indonesia. In Malaysia, the government imposed a complete mining ban at the start of 2016, in order to limit supply growth and address socio-environmental concerns. The ban has been extended four times, and is expected to stay in place for the remainder of 2017. However, bauxite mining in Pahang, Malaysia's largest bauxite producing area, is still occurring despite the moratorium. The ban has largely been ineffective, as illegal miners respond to strong demand from China.

In Indonesia, the government recently lifted the ban on bauxite exports implemented from 2014 to 2016. The removal of the export ban is likely to be a stimulus for increased bauxite production in Indonesia. Indonesia's bauxite production was 57 million tonnes in 2013.

Guinea has emerged as a major bauxite producer, producing more than 19 million tonnes in the first half of 2017. This is up 51 per cent year-on-year. The remarkable rise of Guinea's bauxite production will lift African bauxite production by at least 23 per cent annually, to 68 million tonnes by 2019. A growing pipeline of bauxite projects with high grade reserves is bolstering Guinea's bauxite productive capacity.

China

Production in China, the world's second largest bauxite producer, is unlikely to rise significantly over the short to medium term. Influences include the curtailment of the alumina production over the 2017–18 winter season, the declining quality of domestic bauxite, and the depletion of resources in China. China's bauxite imports rose by 53% year-on-year in the June quarter 2017. The trend of lower production growth and higher imports is expected to continue in the outlook period.

Chinese bauxite producers and importers currently prefer to make large investment in foreign countries such as Guinea, and ship the bauxite products back to China. The major bauxite importers of China are located in Shandong, with Weiqiao and Xinfu the largest. From their Guinean project, Shandong Weiqiao shipped over 10 million tonnes of bauxite back to China. The volume is expected to rise to 20 million tonnes in 2017, and to 25 million tonnes in 2018. Moreover, Aluminium Corporation of China plans to invest US\$500 million in a project to produce bauxite in Guinea starting next year.

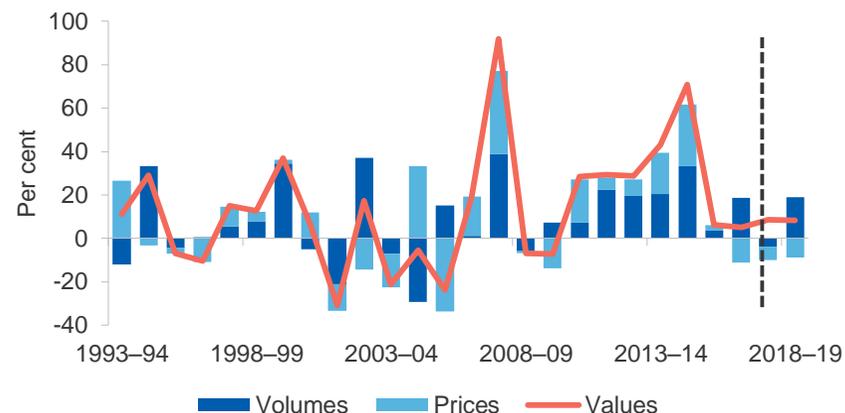
Ghana is another potential bauxite producer in Africa. In June 2017, the Chinese government pledged a US\$15 billion loan to the government of Ghana for the construction and development of bauxite processing facilities.

Australia's exports and production

Bauxite exports higher in 2016–17

In 2016–17, Australia exported \$1 billion worth of bauxite, 5.1 per cent higher than in 2015–16, as higher volumes offset the impact of lower prices. Export volumes increased by 19 per cent to 25 million tonnes, driven by increased exports to China.

Figure 11.16: Annual growth in Australia's bauxite export values, contributions from prices and export volumes



Source: ABS (2017) *International Trade in Goods and Services*, 5368.0; Department of Industry, Innovation and Science (2017)

Bauxite exports to continue increase in 2017–18 and 2018–19

Australia's bauxite exports are estimated to increase at an annual average rate of 8 per cent over the next two financial years, to \$1.2 billion by 2018–19. Growth will be driven by an expected rise in alumina production in China. The Chinese government's winter production cut and clampdown on illegal capacity may not be extended after the 2017–18 winter season. If so, Chinese alumina production should return to its pre-curtailment levels in 2018–19, driving demand for Australian bauxite. Export volumes are forecast to increased by 13 per cent to 28 million tonnes.

Chinese alumina refineries are facing a decline in the availability of quality domestic bauxite. This emerging issue is an opportunity for Australian bauxite exporters to ship more quality output to China.

Australia's bauxite production escalates in 2018–19

Australia produced 85 million tonnes of bauxite in 2016–17, up 4.2 per cent from the previous financial year. This was driven by increased production at Rio Tinto's Gove (up 18 per cent) and Weipa mines (up 6.9 per cent) in the Northern Territory and Queensland.

Australia's bauxite production growth is expected to rise in 2018–19, buoyed by the commissioning of the 5 million tonnes a year Metro Mining's Bauxite Hills project in the June quarter 2018, and the 23 million tonnes a year Rio Tinto's Amrun project in the March quarter 2019. These new additions will increase Australian bauxite output by 1.2 per cent and 10 per cent in 2017–18 and 2018–19, to 85 and 94 million tonnes, respectively.

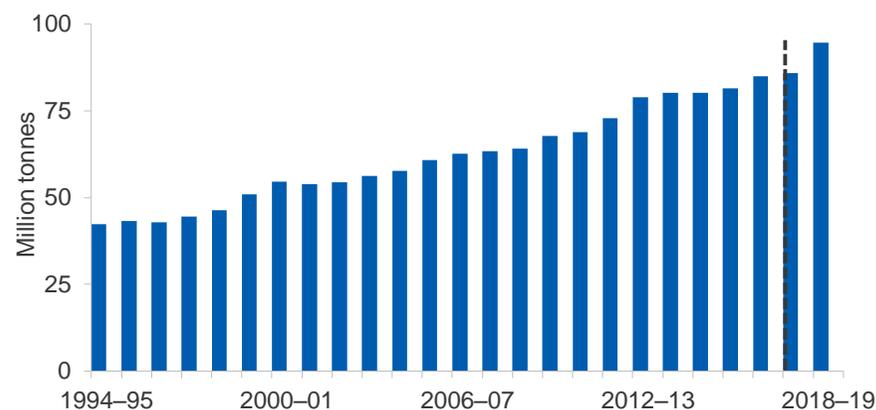
Australian Bauxite Limited has teamed up with Indian marketing partner Rawmin to request a grant from the Australian Government's Regional Jobs and Investment Fund to develop the 28 million tonnes Binjour bauxite project in Central Queensland. If approved and commissioned, the project will produce high quality bauxite for export to the Indian market for the first time in many years.

Risks to Australia's bauxite exports and production

Australia's bauxite exports are facing short-term challenges because of regulatory changes in China — Australia's largest bauxite exporting market. It is still unclear whether or not the winter production cut and illegal capacity cut policies will be extended after 2017. An extension is likely to affect Australia's bauxite export values and volumes, as demand from China's alumina refineries declines. In addition, the 19th National Congress of Communist Party of China, to be held in mid-October 2017, will be important for the medium term direction of the Chinese economy and industry.

Another risk to the Australian bauxite export outlook is illegal mining activity in Malaysia. Despite the mining ban being implemented for almost two years, the country has exported over 9 million tonnes of bauxite to China. Before the moratorium, Malaysia was the largest bauxite exporter to China. The uncontrolled illegal mining in Pahang is likely to put Australian bauxite exporters under pressure, due to cheaper prices.

Figure 11.17: Australia's bauxite production



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

The return of exports from Indonesia, increased volumes from Guinea, and the decision by Chinese refiners to invest in bauxite export opportunities in Africa, are additional risks that will challenge Australia's market share in China.

Rising power costs in Australia will have a considerable impact on operational costs and profitability of Australian aluminium smelters, and hence bauxite demand.

Table 11.1: Aluminium, alumina and bauxite outlook

World	Unit	2016	2017 s	2018 f	2019 f	Annual percentage change		
						2017 s	2018 f	2019 f
Primary aluminium	kt							
Production	Kt	58,158	57,963	62,805	65,117	-0.3	8.4	3.7
Consumption	Kt	58,061	59,977	61,754	63,407	3.3	3.0	2.7
Closing stocks b		2,762	2,705	2,651	2,598	-2.0	-2.0	-2.0
– weeks of consumption		7.5	5.5	6.2	7.5	-26.5	13.2	19.9
Prices aluminium c								
– nominal	US\$/t	1,604	1,995	1,957	1,766	24.4	-1.9	-9.8
– real d	US\$/t	1,637	1,995	1,917	1,692	21.9	-3.9	-11.7
Prices alumina spot								
– nominal	US\$/t	253.2	324.3	322.2	304.7	28.1	-0.6	-5.4
– real d	US\$/t	258.3	324.3	315.5	292.0	25.5	-2.7	-7.4
Australia	Unit	2015–16	2016–17	2017–18 s	2018–19 f	2016–17	2017–18 s	2018–19 f
Production								
Primary aluminium	kt	1,649	1,518	1,591	1,588	-7.9	4.8	-0.2
Alumina	kt	20,550	20,599	20,639	20,792	0.2	0.2	0.7
Bauxite	Mt	81.5	84.9	85.9	94.6	4.2	1.2	10.1
Consumption								
Primary aluminium	kt	207	164	183	191	-20.9	11.6	4.2
Exports								
Primary aluminium	kt	1,442	1,328	1,408	1,397	-7.9	6.0	-0.8
– nominal value	A\$m	3,241	3,158	3,831	3,276	-2.6	21.3	-14.5
– real value e	A\$m	3,368	3,226	3,831	3,199	-4.2	18.7	-16.5
Alumina	kt	17,676	18,230	18,267	18,413	3.1	0.2	0.8
– nominal value	A\$m	5,995	6,655	7,822	7,595	11.0	17.5	-2.9
– real value e	A\$m	6,231	6,800	7,822	7,418	9.1	15.0	-5.2
Bauxite	Kt	20,971	24,856	25,158	28,380	18.5	1.2	12.8
– nominal value	A\$m	992	1,043	1,134	1,229	5.1	8.7	8.4
– real value e	A\$m	1,031	1,065	1,134	1,200	3.4	6.4	5.9
Total value								
– nominal	A\$m	10,228	10,856	12,786	12,100	6.1	17.8	-5.4
– real e	A\$m	10,629	11,092	12,786	11,818	4.4	15.3	-7.6

Notes: **b** Producer and LME stocks; **c** LME cash prices for primary aluminium; **d** In 2017 calendar year US dollars; **e** In 2017–18 financial year Australian dollars; **f** Forecast; **s** Estimate
Source: ABS (2017) International Trade in Goods and Services, 5368.0; AME Group (2017); LME (2017); Department of Industry, Innovation and Science (2017); International Aluminium Institute (2017); World Bureau of Metal Statistics (2017)