Aluminium

Australia's aluminium sector

Largest bauxite producing nation – **103 million tonnes** in 2021

Largest alumina exporter – **18 million tonnes** in 2021

2nd largest alumina producer – **21 million tonnes** in 2021

Major Australian bauxite deposits, Gt

Primary aluminium top consumer markets, 2021

China	60%
United states	7%
Germany	3%
Japan	3%
India	2%

Aluminium facts

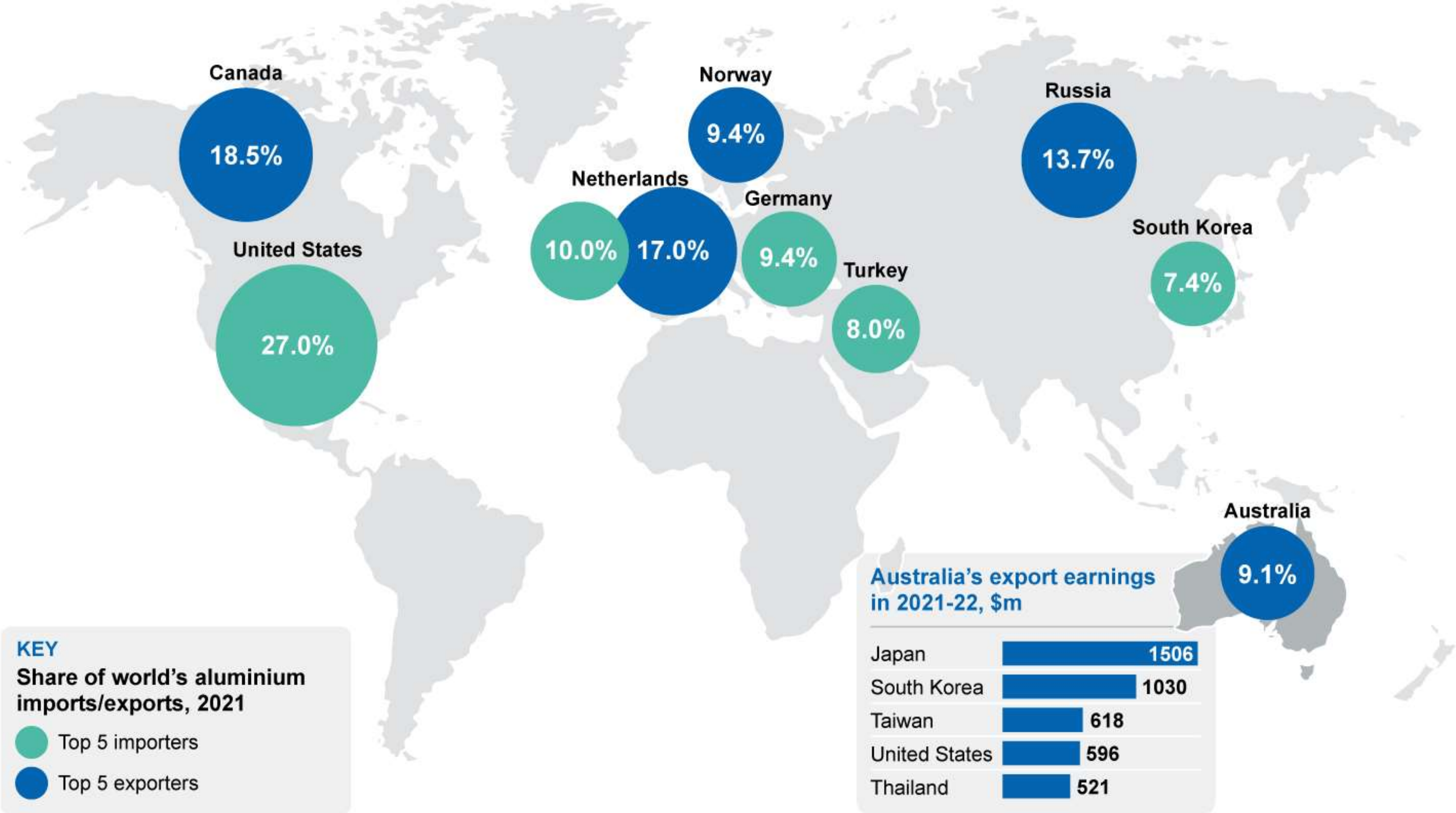
Bauxite ore is refined to recover alumina and smelted to make aluminium

2-3 tonnes of bauxite is required to produce one tonne of alumina

China is the ***largest producer and consumer*** of primary aluminium

Each electric vehicle ***contains 0.25 tonnes*** of aluminium

Aluminium TRADE MAP



11.1 Summary

- Higher primary aluminium supply from China is expected to place downward pressure on aluminium prices over the outlook period, trending lower from an average of US$2,710 a tonne in 2022 to US$2,400 a tonne in 2024. Growing demand for new energy-efficient cars and technologies will provide some support for aluminium prices.
- Australia's annual primary aluminium and alumina output is expected to be broadly steady over the outlook period at around 1.6 million tonnes of primary aluminium and 21 million tonnes of alumina. Australia's annual bauxite output is expected to increase from 105 million tonnes in 2022–23 to nearly 108 million tonnes in 2023–24 (see Australia section).
- The total value of Australia's aluminium, alumina and bauxite exports is forecast to fall by 4.3% in 2022–23 and by 4.9% in 2023–24 to $14 billion.

11.2 World consumption

China led higher primary aluminium consumption in Q3 2022

Global primary aluminium consumption rose by 1.5% year-on-year to 17 million tonnes in the September quarter 2022, driven by higher demand from China.

In China, primary aluminium consumption rose by 4.4% year-on-year in the September quarter 2022 to nearly 11 million tonnes. The improvement in the automotive sector offset the continued weakness in the property sector. Since the June 2022 *Resources and Energy Quarterly* (*REQ*), the Chinese Government has rolled out a further series of measures to stabilise the economy. These measures have supported the recovery of China's automotive market, with total automotive production rising by 8.1% year-on-year in the first-ten months of 2022 to 22 million units. Over this period, China's automotive sales also rose by 4.9% year-on-year to nearly 22 million units.

The weakness in the Chinese property sector (previously discussed at the September 2022 *REQ*) shows no signs of abating, despite policy loosening from local authorities. Supportive measures include lifting of home purchase restrictions, loosening of mortgage terms, lowering of borrowing rates, and the provision of subsidies for homebuyers.

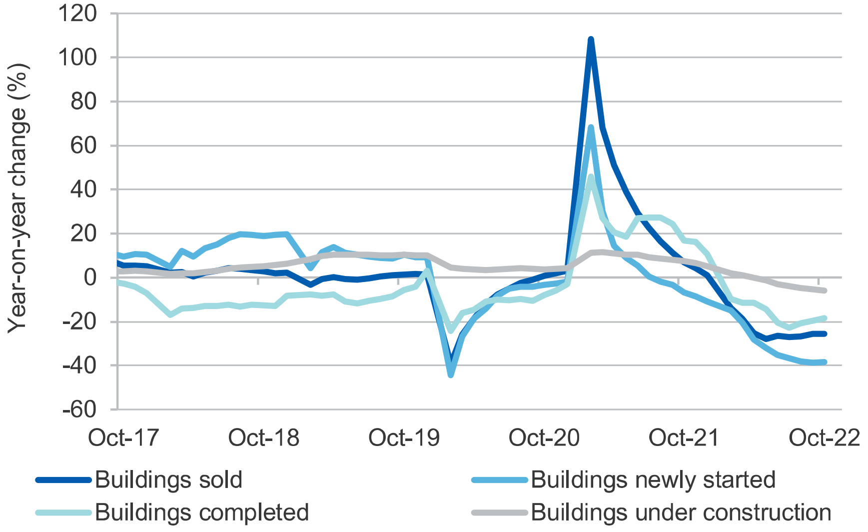
Chinese residential building activity indicators showed continued weakness in October 2022. This includes residential sales falling by 26% year-on-year to 941 million square meters, new residential building starts falling by 39% year-on-year to 759 million square meters, residential buildings under construction falling by 5.9% year-on-year to 6,283 million square meters, and residential buildings completed falling by 18% year-on-year to 338 million square meters (Figure 11.1).

The European automotive sector has continued to be affected by rising energy costs. Vehicle car sales decreased by 14% year-on-year in the first-ten months of 2022 to 10 million units. According to the German Association of the Automotive Industry September 2022 survey, around 10% of firms in the sector have already cut output, with another 30% planning production cuts. In term of investment, 53% of automotive producers in Europe are likely to defer or cancel their planned investments.

World alumina usage increased by 4.1% year-on-year in the September quarter 2022 to 34 million tonnes, due to higher global aluminium production (up by 1.2% year-on-year over the same period). China remains the world's largest alumina consuming country, accounting for 59% of global alumina consumption. In the September quarter 2022, China consumed nearly 20 million tonnes of alumina, an increase of 7.1% year-on-year. Outside of China, alumina consumption in India and the UAE rose by 7.2% and 14%, to reach 2.1 and 1.3 million tonnes in the September quarter 2022, respectively.

World bauxite usage increased by 3.5% year-on-year in the September quarter 2022 to nearly 92 million tonnes, due to a rise in global alumina production (up 2.2% in the September quarter 2022). China remained the world's largest bauxite consuming country, accounting for 55% of global bauxite consumption.

Figure 11.1: China's residential buildings activity



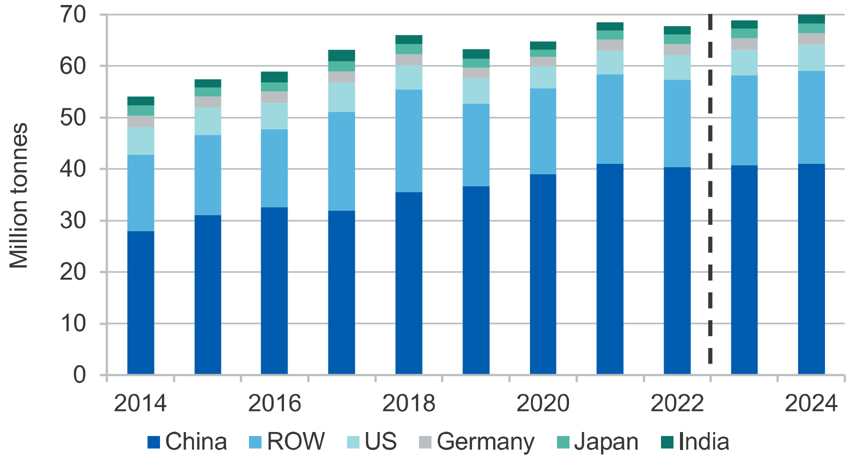
Source: Bloomberg (2022)

Slowing global economy reduces primary aluminium usage in 2022

Global primary aluminium consumption is estimated to decrease by 1.1% in 2022, to 68 million tonnes (Figure 11.2). Slowing global economic growth and rising inflation and interest rates in many parts of the world are expected to affect primary aluminium consumption over the rest of 2022 and the first-half of 2023.

In early November, the Chinese government announced 20 measures guiding a partial relaxation of COVID controls, as well as 16 measures to revive its sluggish property sector. Support for the sector included measures such as extending existing developer loans, supporting property sales through lower down-payments and mortgage rates, boosting other funding channels to the developers, and ensuring the delivery of pre-sold property. Despite the recent government support, a stabilisation of China's property sector has yet to materialise. As a result, primary aluminium demand from China is estimated to fall by 1.4% in 2022.

Figure 11.2: World primary aluminium consumption



Source: World Bureau of Metal Statistics (2022); Macquarie (2022); Department of Industry, Science and Resources (2022)

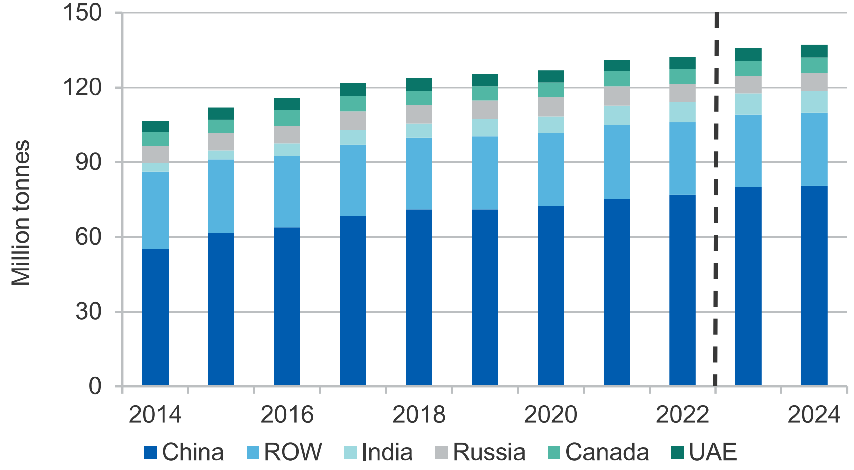
Amongst other major consumers, European economic woes, likely to lead to a recession in coming months, are expected to lead to a further fall in primary aluminium consumption across the region.

In the US, strong demand in the first-half of 2022 is likely to offset soft demand in the second-half of 2022. The housing sector remained under pressure, with new privately owned housing units started (by structure) fell by 6.9% year-on-year in the September quarter 2022 to nearly 4.4 million units. The slowdown indicates that the successive interest rate hikes by the US Federal Reserve have hit the US housing market. As a result, primary aluminium demand from the US is estimated to increase by 4.7% in 2022.

World alumina usage is estimated to rise by 1.1% in 2022 to 132 million tonnes (Figure 11.3). This follows an expected 0.6% rise in global primary aluminium output in 2022.

World bauxite usage is estimated to increase by 1.3% in 2022 to 363 million tonnes (Figure 11.4). The rise is expected to be driven by higher Chinese alumina output.

Figure 11.3: World alumina consumption



Notes: ROW: Rest of the world

Source: Department of Industry, Science and Resources (2022)

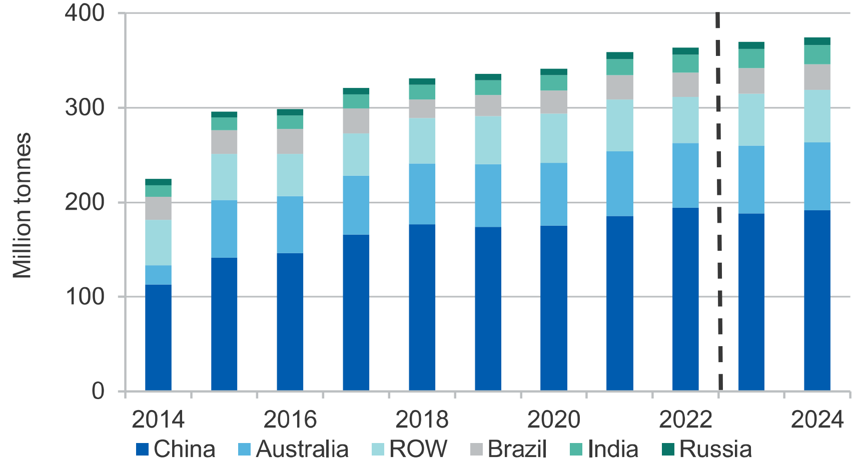
New energy-efficient cars and technologies boost aluminium consumption

Beyond 2022, world primary aluminium consumption is forecast to grow at an annual average rate of 1.6%, to reach 70 million tonnes by 2024 (Figure 11.2). A significant driver of aluminium demand is expected to come from new energy-efficient cars and technologies.

EV passenger car sales are forecast to rise from 6.8 million units in 2021 to 17.6 million units in 2024. With an estimated average aluminium content of 250 kilograms per electric vehicle, aluminium usage in EVs is forecast to increase from 2.8 million tonnes in 2022 to about 4.4 million tonnes in 2024 (Figure 11.5).

In China, larger investments in the electric grid and renewable power are expected to support aluminium demand. According to China's National Energy Administration, newly installed solar power rose by 110% year-on-year in the first-seven months of 2022. Newly installed wind power was up by 19% year-on-year over the same period. China's grid investment in the current five-year plan (2021-2025) is expected to reach RMB3.1 trillion,

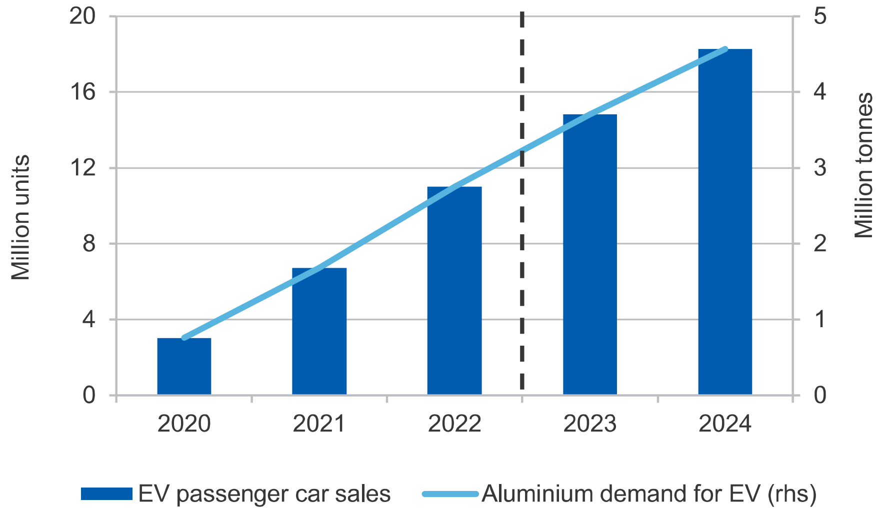
Figure 11.4: World bauxite consumption



Notes: ROW: Rest of the world

Source: Department of Industry, Science and Resources (2022)

Figure 11.5: Global EV car sales vs aluminium demand



Notes: Figures do not include hybrid car sales.

Source: Wood Mackenzie (2022); Department of Industry, Science and Resources (2022) a rise of 18% on the previous five-year plan. The demand for wire and cable in China is expected to grow at an average annual rate of 4.5% between 2022 and 2024.

World alumina usage is forecast to rise at an average annual rate of 1.8% over the outlook period, reaching 137 million tonnes by 2024 (Figure 11.3). Alumina demand is driven by primary aluminium production, which is forecast to lift by an average of 2.1% a year during 2023 and 2024.

World bauxite usage is forecast to grow at an average annual rate of 1.1% over the outlook period to 371 million tonnes in 2024 (Figure 11.4). The gains are expected to be largely driven by higher alumina output from existing refineries in China and India.

11.3 World production

Aluminium, alumina and bauxite output grew in Q3 2022

Global primary aluminium production increased by 3.2% year-on-year in the September quarter 2022 to 17 million tonnes, propelled by higher output in China — the world's largest aluminium producer. China produced 10 million tonnes of primary aluminium in the September quarter 2022, up 7.1% year-on-year, with Chinese smelters responding to the removal of power restrictions and higher power supply.

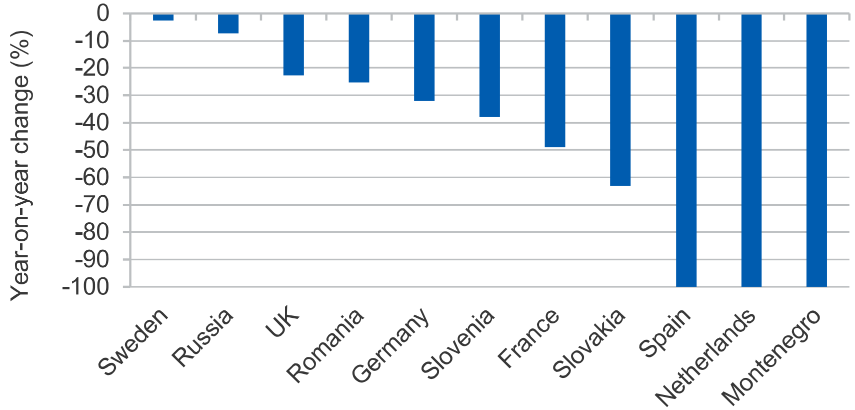
Primary aluminium production in the UAE increased by 8.6% year-on-year in the September quarter 2022 to 618,000 tonnes, driven by the commission of 92 new reduction cells at Emirates Global Aluminium' Al-Taweelah aluminium smelter.

In Europe, primary aluminium output in the September quarter 2022 was severely affected by the region's energy crisis. A number of countries, including Spain, the Netherlands and Montenegro had paused production of primary aluminium, and France and Germany reduced their output by 50% and 32% year-on-year, respectively (Figure 11.6).

In the September quarter 2022, Russian primary aluminium output fell by 7.2% year-on-year to 915,000 tonnes (Figure 11.6). In comparison with the June quarter 2022, Russian primary aluminium output was stable. Stable aluminium production reflects the gradual commissioning of Rusal's 429,000 tonnes a year Taishet aluminium smelter.

World alumina supply increased by 2.0% year-on-year in the September quarter 2022 to nearly 36 million tonnes, driven by higher alumina output from China — the world's largest alumina producer. Over this period, China produced 21 million tonnes of alumina, up 8.9% year-on-year.

Figure 11.6: Primary aluminium production of selected European countries, September quarter 2022



Source: World Bureau of Metal Statistics (2022)

Outside of China, Indonesia's alumina output rose by 10% year-on-year in the September quarter 2022 to 375,000 tonnes, propelled by continued production ramp-up at the 300,000 tonnes a year Tayan alumina refinery.

High energy prices have hit the European alumina sector severely, with production curtailments occurring across the region. In Romania, Alro Slatina's 600,000 tonnes a year Alum Tulcea alumina refinery — Romania's sole alumina producer — temporarily suspended production from August 2022, due to high energy prices.

And in Spain, in early July 2022 Alcoa announced a 15% production cut to its 1.6 million tonnes a year San Ciprian alumina refinery, due to high energy prices. Another 45% of production capacity was cut in August/September 2022.

Alumina production in Australia — the world's second largest alumina producer — fell by 7.8% year-on-year in the September quarter (see *Australia's exports and production* section).

World bauxite supply increased by 6.1% year-on-year in the September quarter 2022, to 94 million tonnes, driven by higher output in Guinea — the world's second largest bauxite producing country. Over this period, bauxite production in Guinea increased by 34% year-on-year to 25 million tonnes, as the ramp up of production continued. In the September quarter 2022, Australian production fell by 1.7% year-on-year to 26 million tonnes (see *Australia's exports and production* section).

World aluminium, alumina and bauxite output estimated to rise in 2022

World primary aluminium output in 2022 is estimated to increase by 0.6% year-on-year to nearly 68 million tonnes, driven by increased production from China, India and Australia (Figure 11.7).

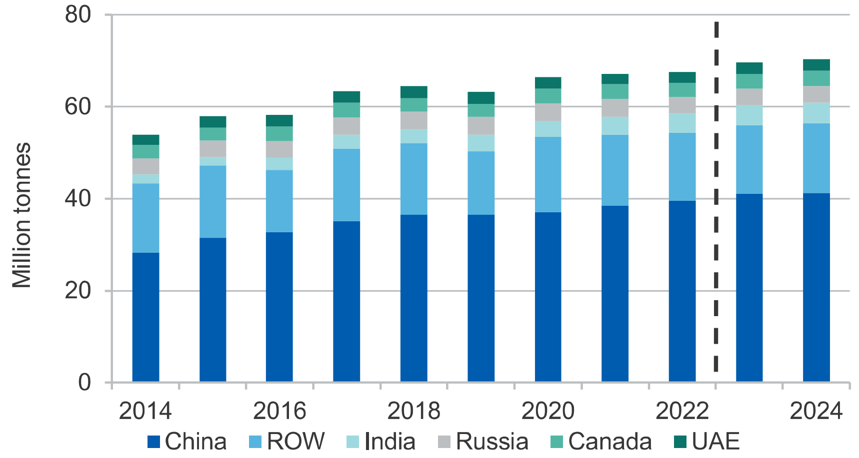
In China, aluminium smelters in the Sichuan province have resumed operations as power supply has been restored. The 400,000 tonnes a year Baiyinhua aluminium smelter in Inner Mongolia area was commissioned in October 2022, after a one year delay due to strict environmental and energy control policy. As a result, Chinese primary aluminium output is estimated to increase by 2.6% in 2022 to nearly 40 million tonnes.

Downside risks to Chinese production include impending 2022–23 winter production cuts, with some aluminium smelters in Henan province already instructed to curtail their production. It is estimated around 110,000 tonnes a year of capacity is to be cut in Henan province during this winter period. Implementation of winter production curtailments for aluminium smelters in other regions remains unclear at this stage.

Primary aluminium production in India is estimated to increase by 3.2% year-on-year to reach nearly 4.1 million tonnes in 2022.

In Australia, Alcoa Corporation restarted 35,000 tonnes a year idled capacity at its Portland Aluminium smelter in Victoria in September 2022. The reactivated capacity is expected to raise Australian primary aluminium output to over 1.6 million tonnes a year.

Figure 11.7: World primary aluminium production



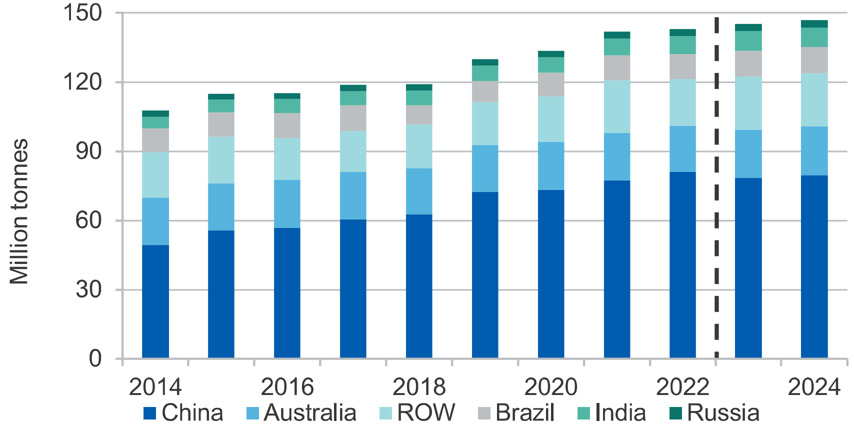
Notes: ROW: Rest of the world
Source: World Bureau of Metal Statistics (2022); Macquarie (2022); Department of Industry, Science and Resources (2022)

In Europe, primary aluminium output is expected to continue declining in the December quarter 2022, due to lower power availability this winter. As a result, European (ex-Russian) primary aluminium output is estimated to fall by 18% in 2022 to 3.4 million tonnes.

World alumina output is estimated to increase by 0.8% year-on-year to 143 million tonnes in 2022, driven by increased alumina production from China (Figure 11.8). Like its aluminium smelters, Chinese alumina refineries have resumed operations after power rationing in July and August of this year.

Bosai Minerals' 800,000 tonnes a year Nanchuan Shuijiang alumina refinery partially resumed operations in mid-September 2022. Bosai Group's 3.6 million tonnes a year Wanbo New Materials alumina refinery in Wanzhou province cut its capacity by 20% in August 2022, but has gradually resumed its production since early September 2022.

Figure 11.8: World alumina production



Notes: ROW: Rest of the world

Source: World Bureau of Metal Statistics (2022); Macquarie (2022); Department of Industry, Science and Resources (2022)

World bauxite supply is estimated to rise by 4.1% to 383 million tonnes in 2022, driven by higher production in Guinea (up 10% year-on-year to 96 million tonnes) (Figure 11.9).

Guinea is expected to join Australia as the only two nations to produce over 100 million tonnes of bauxite in a year (Figure 11.10). Over the last decade, Guinea's bauxite production has grown an average of 18% a year (Figure 11.10). Guinea is expected to overtake Australia as the world's largest bauxite producer before the end of 2024.

Aluminium, alumina and bauxite output to rise over the outlook period

World primary aluminium output is forecast to rise at an average annual rate of 2.1% in 2023 and 2024, reaching 70 million tonnes by 2024 (Figure 11.7). The gains are expected to be driven by increased aluminium output from China and Bahrain. After a 2.6% rise in 2022, China's primary aluminium output is forecast to continue growing: by 4.0% in 2023, followed by a further 0.5% growth in 2024 to over 41 million tonnes.

The risk to the Chinese production forecast remains the timing of restarts in the Yunnan province. Due to power restrictions in July/August 2022, most aluminium smelters in the province were asked to curtail or stop production. With the power restrictions now removed, smelters in the region are expected to restart either before the end of this year or in the first-half of 2023. However, the restarts will not be implemented if there remains uncertainty about the power supply. The Chinese Government's zero-COVID policy is a further risk to the restarts.

Outside of China, the Alba Aluminium smelter in Bahrain completed a pre-feasibility study for its Line 7 expansion project in the September quarter 2022. It is highly likely that the proposed Line 7 project will commence in 2023. Once completed, it will increase the smelter's output from 1.56 million tonnes in 2021 to 1.68 million tonnes in 2024.

World alumina output is forecast to increase by 1.4% a year over the outlook period, reaching 147 million tonnes by 2024 (Figure 11.8). The gains are forecast to be driven by China and Indonesia.

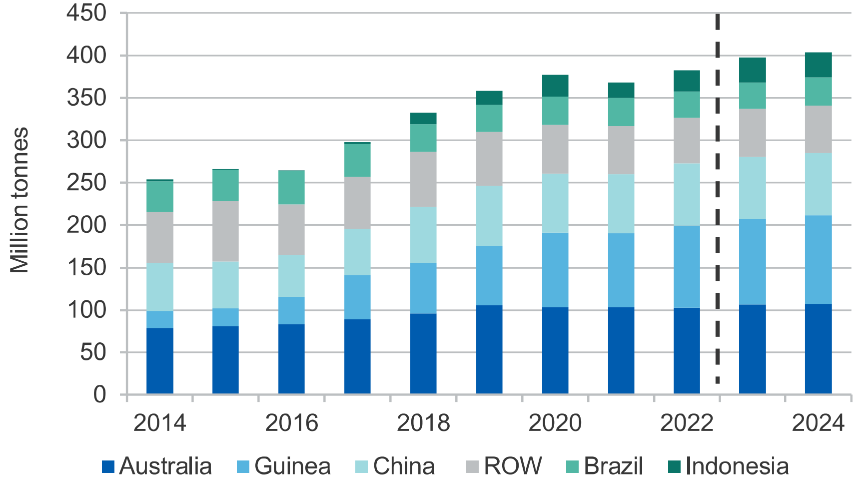
China Aluminium Company and the Indonesian joint-venture partners' 2 million tonnes a year Mempawah alumina refinery in Indonesia is expected to come online in 2024. The operators and contractors reached an agreement in October 2022 to continue the work after several contract adjustments were made.

In August 2022, the eastern Indian state of Odisha approved Adani's 4 million tonnes a year alumina refinery project. The cost of the project is estimated to be US$5.2 billion. Start and completion dates for the project are still unknown.

After 2022, world bauxite production is forecast to increase by 2.7% a year over the outlook period, reaching 403 million tonnes by 2024 (Figure 11.9). Australia, Guinea and Brazil are expected to contribute most to this rise.

In October 2022, Norwegian aluminium producer Norsk Hydro announced a US$110 million investment to expand its 11 million tonnes a year Paragominas bauxite mine in Brazil. The expansion is expected to come online in mid-2023.

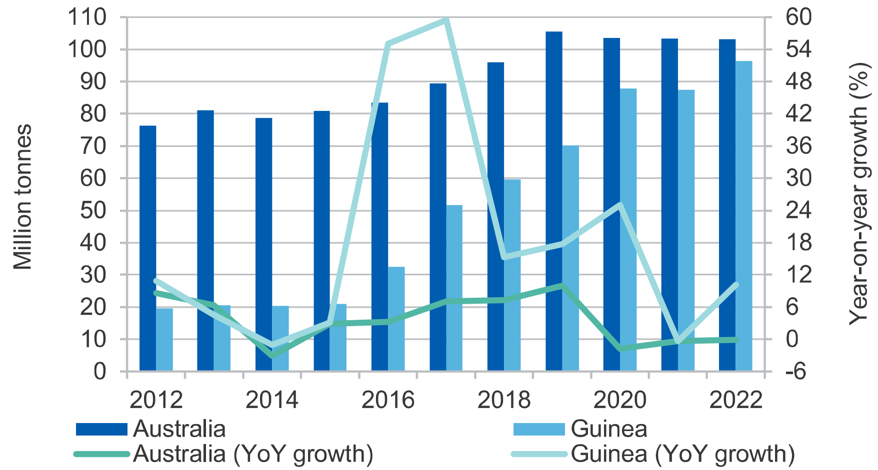
Figure 11.9: World bauxite production



Notes: ROW: Rest of the world

Source: World Bureau of Metal Statistics (2022); Department of Industry, Science and Resources (2022)

Figure 11.10: Australian and Guinean bauxite production



Notes: Production figures for December quarter 2022 are estimated.

Source: World Bureau of Metal Statistics (2022); Department of Industry, Science and Resources (2022)

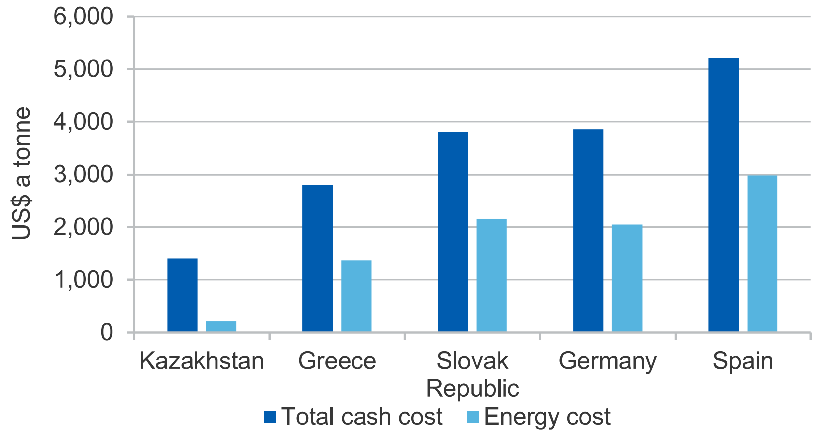
Cost of production

Figure 11.11 shows the aluminium smelters' total cash and energy costs by primary aluminium producing nations in 2022. Out of 35 producing nations, 25 have an average total cash costs above the US$2,000 a tonne profitability boundary. In Europe, the cost of producing a tonne of primary aluminium has skyrocketed due to higher energy costs. The total cost has averaged US$5,205 a tonne in Spain, US$3,856 a tonne in Germany, US$3,813 a tonne in Slovak Republic and US$2,798 a tonne in Greece.

Energy is the main contributor to rising primary aluminium production costs in Europe. It accounts for about 49-57% of costs of major producers such as Spain, Germany, Slovak Republic and Greece. In comparison with Kazakhstan (the lowest cost producer), the cost of energy is 13 times higher in Spain, 9 times higher in Germany, 9 times higher in Slovak Republic and 5 times higher in Greece.

Vedanta — India's largest aluminium producer — sees lower costs of production in the second-half of 2023 financial year. With lower alumina prices, lower power cost and better coal linkages, the company expects its aluminium production cost will be reduced by around US$341 a tonne.

Figure 11.11: Aluminium smelter cash and energy costs, 2022



Source: Wood Mackenzie (2022)

11.4 World trade

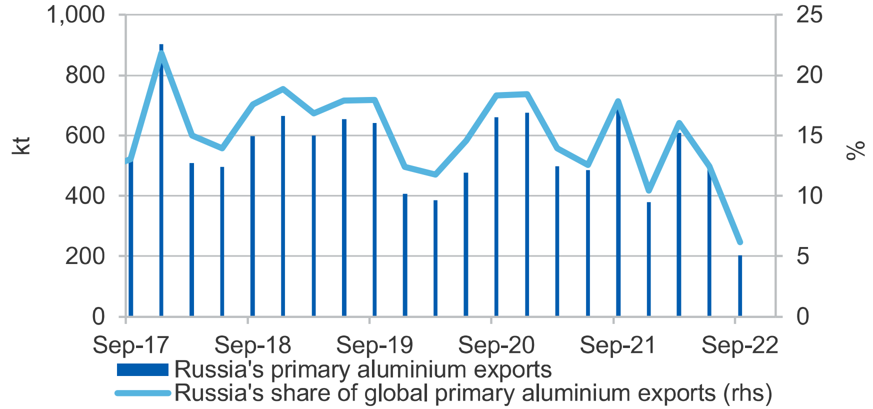
Weak aluminium exports from Russia in the September quarter 2022

World primary aluminium exports decreased by 15% year-on-year in the September quarter 2022 to 3.3 million tonnes, due to lower exports from Russia and Norway.

The fallout from the Russian invasion of Ukraine has reduced Russian primary aluminium exports by 71% year-on-year in the September quarter 2022 to 204,000 tonnes. Despite Russian aluminium not being sanctioned in the US and other western nations, Russian aluminium exports have fallen, with the country's share of world primary aluminium exports falling from 16% in the March quarter 2022 to 6.2% in the September quarter 2022 (Figure 11.12).

Offsetting the fall in aluminium exports from Russia were higher primary aluminium exports from China. China's primary aluminium exports accelerated in the first-ten months of 2022. Over this period, China exported 202,738 tonnes of primary aluminium, 24 times higher year-on-year (Figure 11.13). Of this, 31% was exported to the Netherlands, 17% to Turkiye and 15% to South Korea.

Figure 11.12: Russia's primary aluminium exports and share of global primary aluminium exports, quarterly



Source: UN Comtrade (2022); World Bureau of Metal Statistics (2022)

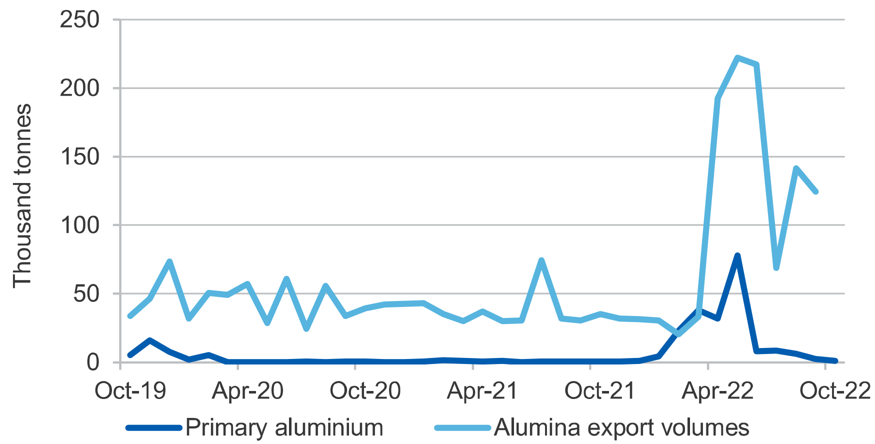
World alumina exports declined by 4.0% year-on-year in the September quarter 2022 to over 10 million tonnes, due to lower alumina exports from Australia. Over this period, exports from Australia — the world's largest alumina exporter — declined by 8.4% year-on-year. A 7.8% year-on-year fall in Australian alumina output in the September quarter 2022 was the driver of lower alumina exports (see *Australia's exports and production*).

Offsetting the decline in alumina exports from Australia was an increase in alumina exports from Brazil and China. In the September quarter 2022,

Brazil exported 2.5 million tonnes of alumina, a rise of 26% year-on-year. Over this period, China exported 335,000 tonnes of alumina, an increase of 145% year-on-year (Figure 11.13).

World bauxite exports increased by 10% year-on-year in the September quarter 2022 to nearly 38 million tonnes, propelled by a 30% year-on-year rise in Guinea — the world's largest bauxite exporter. Over this period, bauxite exports from Australia — the world's second largest bauxite exporter — fell by 8.6% year-on-year to 8.8 million tonnes. Bauxite exports from Indonesia decreased by 19% year-on-year in the September quarter 2022 to 3.3 million tonnes.

Figure 11.13: China's primary aluminium and alumina exports



Source: China Customs (2022); Department of Industry, Science and Resources (2022)

Some Indonesian mines have obtained export quotas to China from the Indonesian government in the second-half of 2022. It is expected that about 3 million tonnes of bauxite will be delivered to China in the December quarter 2022. At the time of writing, the Indonesian Government had not indicated whether a bauxite export ban will be imposed before the end of the year.

Higher aluminium and bauxite imports, but lower alumina imports

World primary aluminium imports rose by 5.3% year-on-year in the September quarter 2022 to 5.2 million tonnes, driven by increased imports from the US and some European countries.

In Europe, primary aluminium output has been declining since mid-2021, due to energy shortages and higher power costs, with many nations turning to imports to meet primary aluminium demand. In the September quarter 2022, Germany imported 532,000 tonnes of primary aluminium, up 7.9% year-on-year. Over the same period, Italy imported 335,000 tonnes of primary aluminium, up 28% year-on-year.

In the US, primary aluminium imports rose by 27% year-on-year in the September quarter 2022 to 1.6 million tonnes, due to lower primary aluminium production. Over this period, the US produced 189,000 tonnes, down by 16% year-on-year.

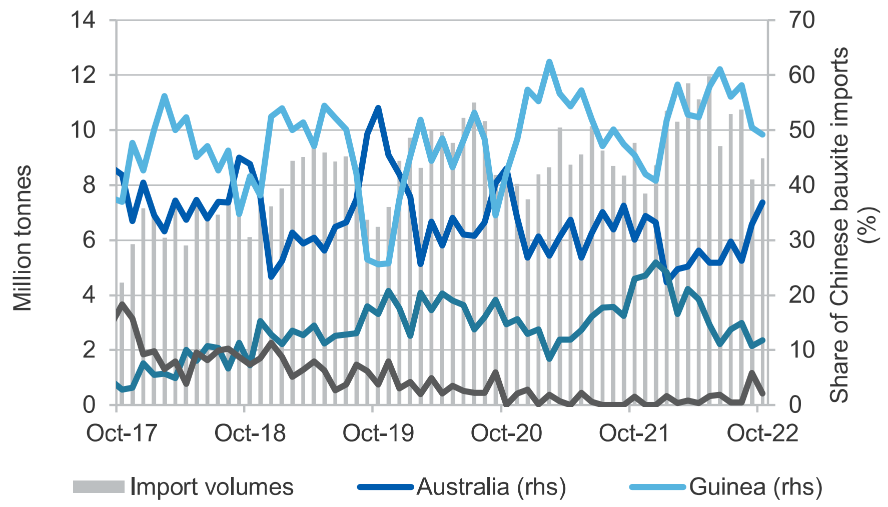
On 10 November 2022, the US Government revoked Russia's 'market economy' status. This decision is likely to lead to higher imported duties on Russian aluminium. However, the US is less dependent on Russian primary aluminium than in the past, and reduction in Russian exports as a result of higher duties is expected to have a limited impact on US primary aluminium supply.

China's primary aluminium imports fell by 55% year-on-year to 176,000 tonnes in the September quarter 2022, due to lower domestic demand.

World alumina imports fell by 3.2% year-on-year in the September quarter 2022 to 9.6 million tonnes, due to a 56% year-on-year fall in alumina imports from China. Imports fell due to higher Chinese alumina production.

World bauxite imports rose by 5.6% year-on-year in the September quarter 2022 to nearly 36 million tonnes, driven by higher imports from China — the world's largest bauxite importer. China imported nearly 30 million tonnes of bauxite in the September quarter 2022, a 12% year-on-year rise from the September quarter 2021. Over this period, Guinea was the largest supplier of bauxite to China accounting for 55% of China's total bauxite imports, followed by Australia (accounting for 30%), and Indonesia (accounting for 13%) (Figure 11.14).

Figure 11.14: China's bauxite import volumes and sources



Notes: ROW: Rest of the world

Source: Bloomberg (2022)

11.5 Prices

LME aluminium price under pressure

The London Metal Exchange (LME) spot price for aluminium is expected to come under pressure during 2023: higher interest rates and weakening global economic growth remain risks to aluminium prices. Rising inflation has forced central banks around the world to increase interest rates, which is dampening economic activity. The strong US dollar is also likely to be a continued headwind for the primary aluminium price (Figure 11.15).

The rise of aluminium inventories in Malaysian, Singaporean and South Korean LME warehouses has led to a rise in the global LME inventories.

After reaching a 39-year low of 277,050 tonnes in August 2022, LME stocks rose to 497,925 tonnes in December 2022. Shanghai Futures Exchange stocks fell to a 2.5-year low in July 2022, at 185,358 tonnes, and remained low at 95,477 tonnes in December 2022. LME off-warrant stocks have risen from their lowest level in March 2022, at 361,864 tonnes

Figure 11.15: LME primary aluminium price and the US dollar

Notes: The US dollar trade weighted index is a measure of the value of US dollar relative to currencies that are most widely used in international trade.

Source: Bloomberg (2022); Investopedia (2022)

in September 2022 (Figure 11.16).

The LME primary aluminium spot price is likely to average around US$2,710 a tonne in 2022, up 9.4% from 2021 (Figure 11.18). This is 32% below a 34-year high of US$3,985 a tonne on 7 March 2022 — when the market reaction to the Russian invasion of Ukraine was at its peak.

The September 2022 REQ forecast a world aluminium deficit in 2022. However, a surge in Chinese production in the second half of 2022 now appears to have created a market surplus for the year. This surplus has pushed the LME price lower. In line with the rise in primary aluminium price, the free on board (FOB) Australian alumina price is estimated to increase by 11% in 2022 to average US$365 a tonne (Figure 11.17).

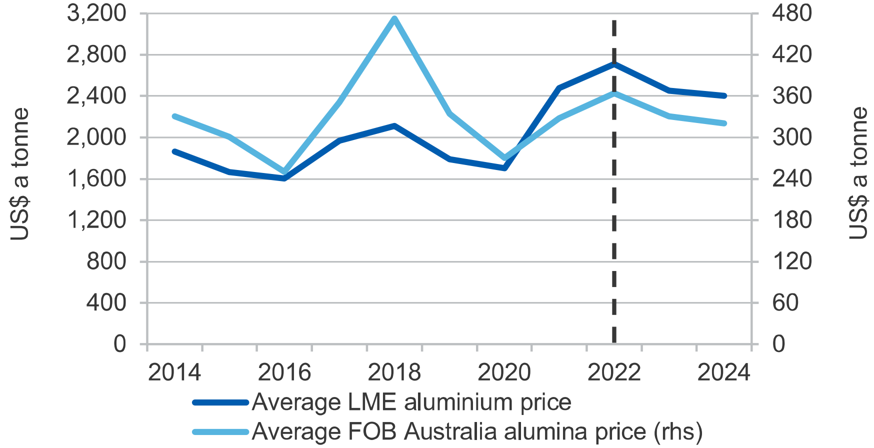
Primary aluminium and alumina prices to fall in 2023 and 2024

The LME aluminium price is forecast to drift down to an average of US$2,450 and US$2,400 a tonne in 2023 and 2024, respectively (Figure 11.17). Slowing global economic growth and rising global primary aluminium production are expected to be significant factors of decreased

Figure 11.16: Exchange aluminium stocks

Source: London Metal Exchange (2022); Bloomberg (2022)

Figure 11.17: World primary aluminium and alumina prices



Source: LME (2022); Bloomberg (2022); Department of Industry, Science and Resources (2022)

aluminium prices. The outlook for 2023 and 2024 is also dependent on the strength of Chinese aluminium demand and Russian aluminium exports.

Like aluminium, the FOB Australian alumina price is forecast to fall in 2023 and 2024, averaging US$320 a tonne in 2024 (Figure 11.17).

11.6 Australia's exports and production

Higher alumina prices drove exports in the September quarter 2022

Australia's aluminium, alumina and bauxite (AAB) exports increased by 3.4% year-on-year in the September quarter 2022 to $3.7 billion, propelled by higher alumina prices. A 6.9% year-on-year rise in the FOB Australian alumina price in the September quarter 2022 helped boost Australian alumina export values by 14% year-on-year to $2.1 billion in the September quarter 2022.

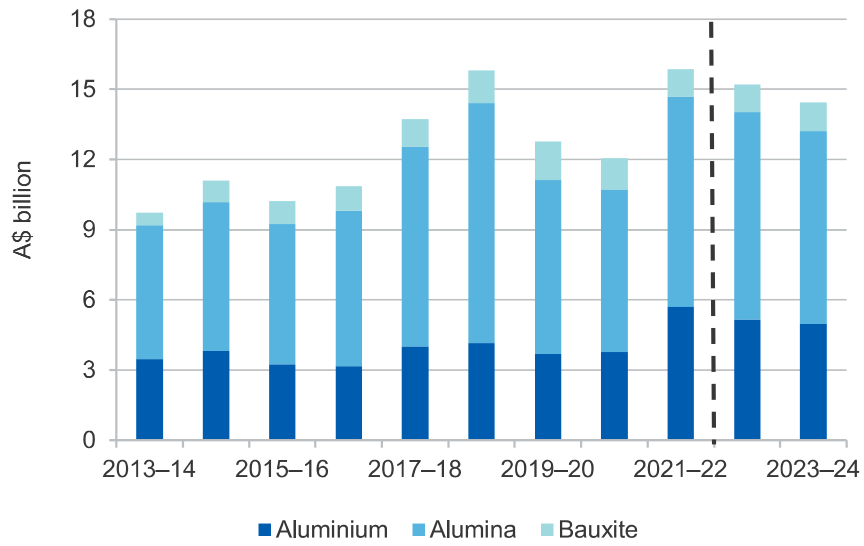
Australian primary aluminium export values decreased by 5.5% year-on-year in the September quarter 2022 to $1.3 billion, due to an 11% year-on-year fall in the LME aluminium prices in the September quarter. At 345,000 tonnes, Australia's primary aluminium export volumes were down by 9.1% year-on-year in the September quarter 2022.

Australian bauxite export values decreased by 19% year-on-year in the September quarter 2022 to $279 million. Australia's bauxite export volumes decreased by 7.3% year-on-year in the September quarter 2022. China remained virtually the whole market for Australian bauxite, accounting for 99% of Australian exports in the September quarter 2022.

Lower aluminium, alumina and bauxite exports over the outlook period

An expected fall in aluminium and alumina prices over the outlook period is likely to reduce Australia's AAB export earnings by 4.3% in 2022–23, and by 4.9% in 2023–24 to $14 billion (Figure 11.18).

Figure 11.18: Australian aluminium/alumina/bauxite exports



Note: April to September 2022 export figures are provisional.

Source: ABS (2022) International Trade in Goods and Services, 5368.0; Department of Industry, Science and Resources (2022)

Australia's alumina/aluminium/bauxite production fell in Q3 2022

Australia's primary aluminium output fell by 4.7% year-on-year in the September quarter 2022 to 371,000 tonnes, due to lower output at Boyne Island, Tomago and Bell Bay aluminium smelters.

Production at Rio Tinto's Boyne Island aluminium smelter in Queensland decreased by 12% year-on-year in the September quarter 2022 to 110,000 tonnes. Rising thermal coal prices in Queensland in the September quarter 2022 affected the output at Boyne Island smelter. Production at Tomago aluminium smelter in NSW and Bell Bay aluminium smelter in Tasmania also fell by 2.7% and 4.2% year-on-year to 146,000 and 46,000 tonnes, respectively.

Australia's alumina output fell by 7.8% year-on-year in the September quarter 2022 to 4.8 million tonnes. Alumina output at South 32, Japan Alumina and Sojitz Alumina joint-venture Worsley Alumina refinery in Western Australia fell by 8.6% year-on-year in the September quarter 2022 to 1.1 million tonnes, due to planned calciner maintenance.

Production at Rio Tinto's Yarwun alumina refinery in Queensland decreased by 7.1% year-on-year in the September quarter 2022 to 715,000 tonnes, due to planned maintenance. Over this period, production at Rio Tinto's Queensland Alumina Limited (QAL) refinery fell by 10% year-on-year to 827,000 tonnes, due to equipment stability issues.

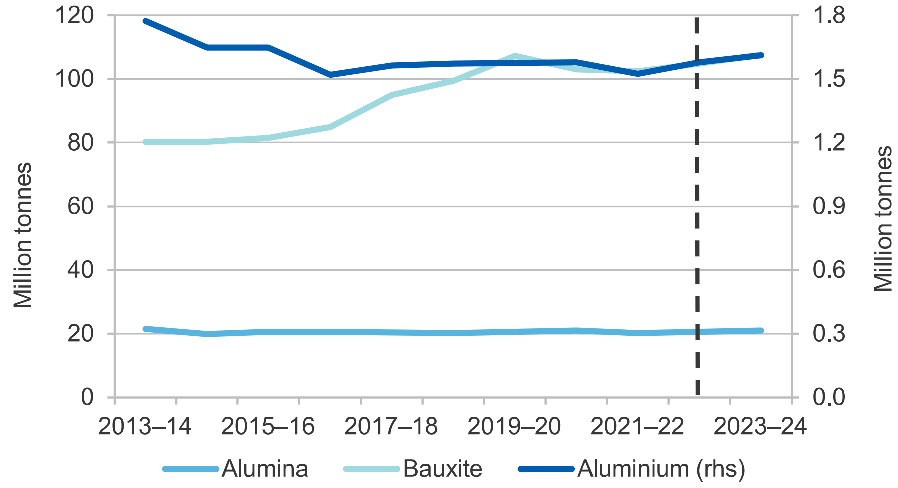
Australia's bauxite output fell by 1.7% year-on-year in the September quarter 2022 to nearly 26 million tonnes. This was due to lower output at the Gove bauxite mine in the Northern Territory (down by 5.3% year-on-year to 2.9 million tonnes), largely due to equipment issues.

Higher bauxite output expected over the outlook period

The restart of 35,000 tonnes a year idled capacity at Portland Aluminium smelter in Victoria in September 2022 is expected to boost Australian primary aluminium output to above 1.6 million tonnes a year from 2022–23 and beyond (Figure 11.19).

Alumina production at Worsley Alumina refinery in WA is expected to be above its nameplate capacity of 4.6 million tonnes a year, driven by improved production initiatives. Absent major disruptions, with no planned expansions at existing alumina operations over the outlook period, Australia's alumina output is forecast to remain at about 21 million tonnes a year (Figure 11.19).

Figure 11.19: Australian aluminium/alumina/bauxite output



Source: Department of Industry, Science and Resources (2022)

Australia's bauxite output is forecast to increase at 2.5% a year between 2022–23 and 2023–24, reaching 108 million tonnes in 2023–24 (Figure 11.19). The expansion of Metro Mining's Bauxite Hills mine in Queensland (subject to financing) from 3.5 million tonnes a year to 6 million tonnes a year is the main driver of this increased output.

Revisions to the outlook

The forecast for the LME aluminium (spot) price has been revised down from the September *REQ*: by US$110 a tonne in 2023 and by US$90 a tonne in 2024. The revision reflects higher than expected primary aluminium output from China.

The forecast for Australia's aluminium, alumina and bauxite export earnings has been revised down from the September 2022 *Resources and Energy Quarterly*: by $309 million in 2022–23 and by $885 million in 2023–24. The revision reflects lower forecast prices for primary aluminium over the outlook period.

Table 11.1: Aluminium, alumina and bauxite outlook

						Annual percentage change		
World	**Unit**	**2021**	**2022 s**	**2023f**	**2024f**	**2022 s**	**2023f**	**2024f**
Primary aluminium								
Production	kt	67,119	67,425	69,520	70,248	0.5	3.1	1.0
Consumption	kt	68,467	67,358	68,459	69,585	-1.6	1.6	1.6
Prices aluminiumc								
- nominal	US$/t	2,477	2,710	2,450	2,400	9.4	-9.6	-2.1
- reald	US$/t	2,676	2,710	2,367	2,268	1.3	-12.6	-4.2
Prices alumina spot								
- nominal	US$/t	328	365	330	320	11.1	-9.4	-3.0
- reald	US$/t	354	365	319	303	2.8	-12.5	-5.1
Australia	**Unit**	**2020–21**	**2021–22**	**2022–23f**	**2023–24f**	**2021–22**	**2022–23f**	**2023–24f**
Production								
Primary aluminium	kt	1,579	1,525	1,578	1,612	-3.4	3.5	2.1
Alumina	kt	20,949	20,138	20,463	20,972	-3.9	1.6	2.5
Bauxite	Mt	103.0	102.4	104.8	107.6	-0.5	2.3	2.7
Consumption								
Primary aluminium	kt	284	240	197	209	-15.3	-18.1	6.2
Exports								
Primary aluminium	kt	1,357	1,368	1,431	1,451	0.8	4.6	1.4
- nominal value	A$m	3,763	5,712	5,171	4,963	51.8	-9.5	-4.0
- real valuee	A$m	4,210	6,118	5,171	4,739	45.3	-15.5	-8.4
Alumina	kt	18,600	17,739	17,889	18,246	-4.6	0.8	2.0
- nominal value	A$m	6,948	8,977	8,846	8,232	29.2	-1.5	-6.9
- real valuee	A$m	7,774	9,616	8,846	7,860	23.7	-8.0	-11.1
Bauxite	kt	35,782	35,957	35,088	35,598	0.5	-2.4	1.5
- nominal value	A$m	1,339	1,177	1,174	1,251	-12.1	-0.2	6.5
- real valuee	A$m	1,498	1,260	1,174	1,194	-15.9	-6.9	1.7
Total value								
- nominal value	A$m	12,050	15,865	15,191	14,446	31.7	-4.2	-4.9
- real valuee	A$m	13,483	16,995	15,191	13,793	26.1	-10.6	-9.2

Notes: **c** LME cash prices for primary aluminium; **d** In 2022 calendar year US dollars; **e** In 2022–23 financial year Australian dollars; **f** Forecast; **s** Estimate
Source: ABS (2022) International Trade in Goods and Services, 5464.0; LME (2022); Department of Industry, Science and Resources (2022); World Bureau of Metal Statistics (2022).