

# Aluminium

The Original Critical Mineral  
and Clean Energy Export

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AUSTRALIAN  
ALUMINIUM  
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# Aluminium

## The Original Critical Mineral and Clean Energy Export

### Executive Summary

Aluminium is essential in modern lives and in advanced economies – it is the original critical mineral. Its light weight, strength, and durability make it the perfect choice to use in everyday life as well as in the clean energy transition. Australian aluminium has also been a clean energy export for nearly 70 years and could become its first superpower.

Today, aluminium is the second most used metal on the planet with around 100 Mt consumed every year. With a global market value of around US\$270B, aluminium is also one of the largest commodity markets and a significant economic opportunity for those nations who can produce it.

Australia is one of the very few nations that supplies aluminium across the whole supply chain from mining to fabrication. It has played an important role in Australia's prosperity, providing a secure source of supply, direct jobs and regional development; export revenue; State and Federal taxes and royalties and providing the reliable demand which underpinned the growth of the energy sector. And the outlook for aluminium is bright – aluminium consumption has nearly tripled since 2001 and is expected to nearly double again by 2050.

Yet the future of the industry in Australia is threatened by high energy costs, proactive industry policy among competitor nations as well as regulatory complexity and uncertainty.

The global aluminium industry has undergone significant structural changes in the last twenty years with major investments in aluminium smelting and alumina refining capacity in China, the Middle East and India shifting the market balance significantly away from traditional producers in North America and Europe. China, Middle Eastern nations, and Russia now account for over 70% of global aluminium production. Securing supplies of bauxite, alumina and aluminium are an increasingly important objective for many nations – particularly Australia's valued Quad Allies.

Australia is well placed to build on its aluminium supply chain to meet growing international demand. To do so, however, requires specific government policies.

As an immediate next step, we call on Australian governments to **assign priority status to bauxite, alumina and aluminium**. Prioritising the aluminium chain within critical minerals and manufacturing policies is a helpful and efficient first step while progressing policy in five other focus areas:

- 1 Deliver internationally competitive supplies of clean energy;**
- 2 Use of Production Tax Credits and a Transformational Infrastructure and Technology Fund** to enable Australia to be sufficiently competitive to be able to attract global decarbonisation investment;
- 3 Prioritise the Australian aluminium value chain** within industry development policies;
- 4 Environmental approval processes** across the supply chain that appropriately balance the environmental rigour and protection with timelines that reflect commercial needs; and
- 5 Development of long-term strategic partnerships** with likeminded countries.

Bauxite, alumina and aluminium will have a central role in Australia's transformation to clean energy superpower, with policy support to be commercially and environmentally sustainable. The industry will continue to employ tens of thousands of Australians in high paying roles, while also meeting our domestic needs and those of our strategic partners in a changing geo-political landscape.

# Aluminium

## Its Role Today and Tomorrow

Aluminium stands as a cornerstone of modern life and advanced economies. Its unique properties of lightweight, strength, recyclability and durability position it as the ideal material for a plethora of everyday items. From the phones and computers for communication, to the planes that soar through the skies and the cars that traverse our roads, aluminium is everywhere in modern life.

Beyond the obvious, aluminium permeates aspects of our lives we seldom ponder, seamlessly integrating into electricity networks, data servers, and renewable energy projects. Its ubiquity extends to unexpected places like the brilliance of fireworks, the illumination of LED light bulbs, and the very heart of nearly every lithium-ion battery pack.

It is clear - a transition to a clean energy future hinge on the abundant presence of aluminium, particularly for electricity transmission systems and power plants. The global push to reduce carbon emissions through clean energy sources like wind turbines and solar PV panels will further elevate aluminium demand due to its capacity to provide robust, lightweight structures. According to the World Bank, aluminium extrusions account for around 85% of the frames used in solar PV<sup>1</sup>.

Aluminium's prominence is a relatively recent phenomenon in human history. Despite its abundance in the Earth's crust, it has only been in widespread use for around a century. In the 1800s aluminium was more precious than gold.

Today, aluminium ranks as the second most utilised metal on the planet, with annual consumption approaching 100 Mt in 2022 making the global aluminium market worth ~US\$270 B (Figure 1). With such a significant presence in the global commodity markets, there are substantial opportunities for nations within the entire aluminium value chain.

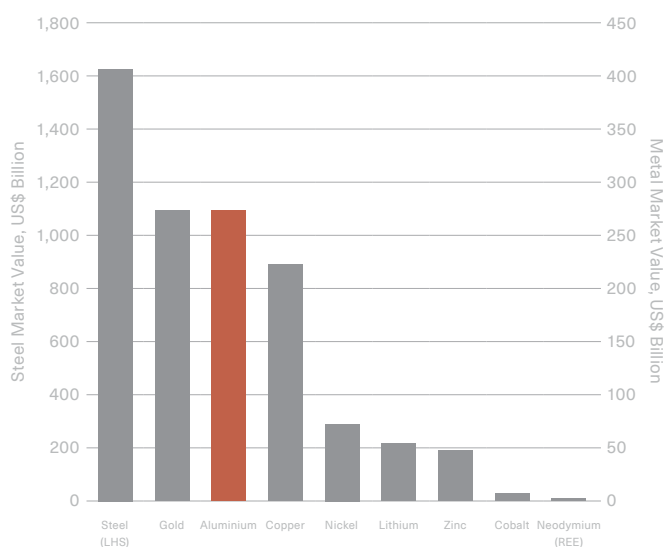
Australia is one of the few fortunate nations that engages in all parts of the aluminium market spanning mining to fabrication. We are the world's largest bauxite miner, the second-largest producer of alumina, and the seventh-largest manufacturer of primary aluminium. This delivers significant economic benefits to the nation. In 2022-23, aluminium generated \$15 billion in export revenue, directly supported 19,000 jobs and paid more than \$2 billion in wages.

As global demand for aluminium is poised to surge in the coming decades, driven by rising incomes in emerging economies and the ever-growing need for electricity worldwide, Australia is primed to reap substantial benefits. Nevertheless, these opportunities will not come without their challenges.

The global aluminium supply chain constitutes a fiercely competitive marketplace, and our miners, refiners, smelters, extruders and downstream fabricators face formidable competition, often from nations with highly supportive government policies. This century has already witnessed a significant shift in market power, with China, Russia and the Middle East now dominating 70% of the primary aluminium market.

The aluminium sector can engender economic and clean energy growth in Australia, if it is prioritised by policymakers, and Australia can maximise its opportunity to contribute to a sustainable, prosperous future. While Australia currently has limited domestic capability, there is an opportunity to develop new recycling industry in Australia in the future, supported by circular manufacturing policies.

Figure 1: Metal market values, 2022



Source: Australian Aluminium Council, Department of Industry, Innovation and Science.

Note: Market value estimated as final consumption multiplied by average annual price.

<sup>1</sup>Moreira, S., and Laing, T., Competitiveness of Global Aluminium Supply Chains Under Carbon Pricing Scenarios for Solar PV, World Bank, 2023.

# The Aluminium Value Chain

## Aluminium – the original critical mineral and clean energy export

The inception of the Australian aluminium industry was marked by strong government support. The construction of the Bell Bay aluminium smelter in Tasmania was catalysed by the Australian Aluminium Industry Act (1944), which established a joint venture between the Federal and Tasmanian governments to ensure domestic aluminium supply during World War II. Construction at Bell Bay commenced in 1950, with first production in 1955, becoming the first smelter in the southern hemisphere.

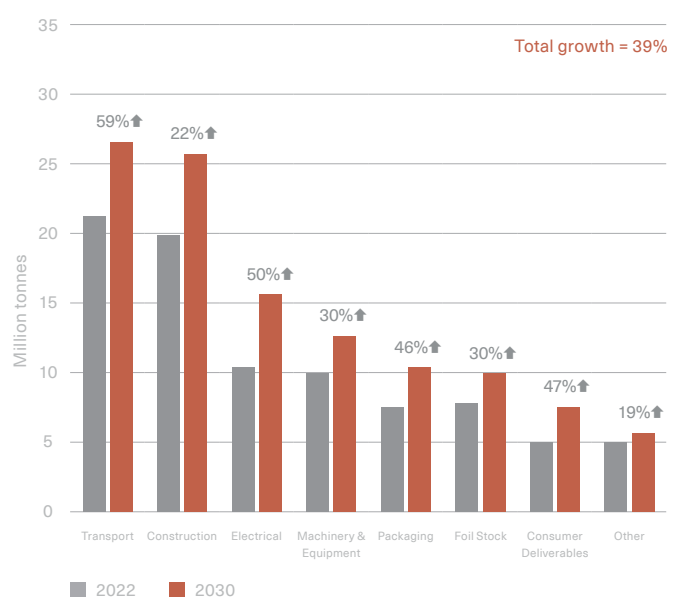
This initial government support subsequently spurred significant investments in new bauxite mining, alumina production, and aluminium smelters across Australia. Currently, the industry directly supports 19,000 jobs, predominantly in regional Australia, while contributing over \$2 billion in wages, generating \$15 billion in annual export revenue, and supporting substantial supply chains in sectors from energy supply to environmental management.

Australia wants to become a clean energy super power. Bell Bay is Australia’s original clean energy super power export, exporting around 170 kt of low carbon aluminium to the world. This is already the equivalent of 3 TWh of green energy exports. Transitioning all of Australia’s smelters would be the equivalent of Australia exporting an additional 18 TWh of clean energy every year. This is bigger than SunCable.

### Value chain overview

Over the past two decades, global aluminium consumption has soared in-line with rising incomes and living standards in highly populated non-OECD countries. It is now approaching 100 Mt as aluminium has become an indispensable component of our modern world (Figure 2). In 2022, global primary aluminium production reached 69 Mt, nearly tripling since the beginning of the 21st century. On top of this, approximately 30 Mt of aluminium are recycled each year.

Figure 2: The outlook for aluminium consumption, by application, 2022-2030



Source: CRU, Opportunities for aluminium in a post-Covid economy, 2022.

Supplying the expected growth in global aluminium consumption will not be easy. Although aluminium is almost infinitely recyclable, most of the market is still supplied through the production of primary metal. While the proportion sourced from recycling is likely to rise there will still be significant growth in the primary aluminium value chain.

### The global significance of the aluminium value chain

Aluminium production commences with the mining of bauxite (aluminium ore), which undergoes chemical processing to yield alumina (aluminium oxide), which is subsequently smelted into aluminium metal before being manufactured into products for everyday use.

Aluminium holds a prominent position in metal markets as the second most consumed metal in the world behind steel. In terms of the value of metal consumed it ranks third globally, trailing only steel

and gold. With demand expected to grow in the next 30 years, maximising Australia's role in the future aluminium supply chain should be a priority for policy makers in federal and state governments to both boost our economic performance and manage the emerging supply chain risks many of our economic and strategic allies are experiencing.

In recent years Australia's resources policy has shifted to focus on minerals used in advanced technologies with high supply chain risks. While this policy focus is essential, governments across Australia should not overlook the ongoing importance of the commodities that deliver the largest economic benefits and offer significant growth opportunities.

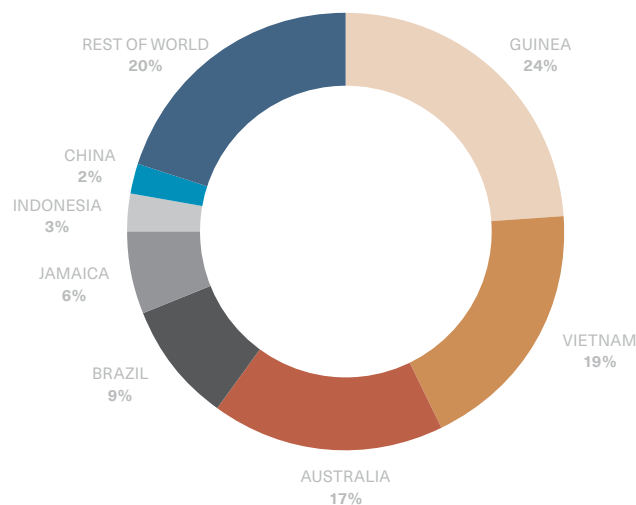
The European Union classifies bauxite as a critical raw material, and the United States includes aluminium on its list of critical minerals, as do a number of other key trade partners. While Australia can satisfy its domestic aluminium needs, its critical minerals classification should consider the strategic requirements of its closest allies and trading partners, as well as its domestic economic interests. Unquestionably, aluminium meets both of these criteria. **Formally recognising bauxite, alumina and aluminium as critical minerals would be a positive first step in positioning Australia as a strategic supplier.** It would offer us the opportunity enhance our position as a valued trading partner and boost access to key markets including the US, Europe, Japan, China, and India.

### Australia's leading position in bauxite mining

Aluminium is the most abundant metal in the Earth's crust. Bauxite (aluminium ore) usually occurs in deposits near the surface and dispersed over large areas. Bauxite is found in many places around the world, but with varying levels of impurities and different grades. Australia has the third largest reserves of bauxite in the world (Figure 3), and much of it is superior grades that make it highly valued in the aluminium production process. These deposits are found in the south-west corner of Western Australia as well as across northern Australia - from the Cape York Peninsula in Queensland to the Kimberley region of Western Australia.

**Formally recognising bauxite, alumina and aluminium as critical minerals would be a positive first step in positioning Australia as a strategic supplier.**

Figure 3: Share of world bauxite reserves, 2023



Source: United States Geological Survey, Commodity Summaries 2023.

Australia's first bauxite mine opened in 1963 and since then, Australia has not only become the world's largest bauxite miner but has also set a global benchmark for sustainable mining practices. In 2022, Australia produced 102 Mt of bauxite, a 34% increase in the past decade<sup>2</sup>. Today Australia remains the world's largest producer of bauxite and produces approximately one quarter of the world's bauxite.

We have the mineral resources, the skilled workforce and world-leading sustainability programs to position Australia to meet future growth in world bauxite demand. With the right policy agenda and government support, investment in new mines will increase regional employment and supply chain opportunities for small and medium enterprises across Australia.

### Second-largest producer of alumina

The second step in the aluminium value chain is alumina refining. The Bayer process produces alumina by reacting crushed bauxite with a caustic soda solution at high temperature to separate the aluminium content of the ore from other impurities. Until 2007, Australia was the world's largest producer of alumina, before being overtaken by China<sup>3</sup>, and is today the world's second largest producer. In 2022, Australia produced 19.5 Mt of alumina, equivalent to around 20% of the world's total production.

<sup>2</sup> Department of Industry, Innovation and Science, Resources and Energy Quarterly.

<sup>3</sup> <https://international-aluminium.org/statistics/alumina-production/>

Alumina refineries already provide some demand response to the grid. With an increased supply of competitively priced clean energy and subject to technical developments, there is the potential to materially increase the electrification of alumina refineries combined with demand response.

## Aluminium smelting

The Hall-Heroult process is used to smelt aluminium using electricity. It dissolves the alumina in an electrolyte at high temperature (around 950 degrees) and uses an electrical current to separate it into pure aluminium and oxygen. The process is energy-intensive, consuming around 14 MWh of electricity to produce a single tonne of aluminium metal. This is the equivalent to the annual average electricity consumption of more than two Australian households. However, smelters' large and fast-acting interruptibility help secure and restore stability to the network before and after contingencies occur. The industry has increasingly been called upon to support grid stability and reliability, as the challenges in managing the increased penetration of variable renewables in the grid increases.

Australia ranks as the seventh-largest aluminium producer globally, producing approximately 1.5 Mt annually across smelting facilities in Queensland, New South Wales, Victoria, and Tasmania.

Energy constitutes around 30-40% of an aluminium smelter's costs, with smelting facilities often established in regions with abundant and affordable energy sources. Countries without bauxite resources engage in aluminium production due to their access to low-cost low-carbon energy supply. Canada, Norway and Iceland for example all boast significant aluminium smelting industries.

## Extrusion, other semi fabrication and aluminium products

The final stage in the aluminium value chain is manufacturing the pure metal into usable products. Aluminium can be formed into a variety of products by extruding, rolling or casting. Most of Australia's aluminium is exported as primary aluminium from the smelter, yet we still have world leading fabrication industry that supplies a range of vital components and materials that are used throughout the economy. Australian operators provide products to key sectors of the market, including the construction, automotive, defence, medical, marine and packaging sectors.

While Australia's rolling mills closed about a decade ago, Australia's extrusion industry remains a key downstream value adding manufacturing sector. Australia's extrusion industry today supplies around 120kt to the Australian domestic markets. Aluminium extrusions are one of the key components in solar

PVs – for both framing and rail. One of the biggest threats to Australia manufacturing sector is imports below internationally accepted pricing standards.

**Australia's manufacturers need free and fair trade to be able to compete.**

The pandemic underscored the importance of local downstream manufacturing. Australia's aluminium extrusion industry was able to maintain supply to the dependent construction and manufacturing sectors.

## Aluminium remains a major economic opportunity for Australia

The Australian aluminium industry has been highly successful since its establishment nearly 70 years ago. It remains a major source of employment and export income yet still has strong growth potential. The bauxite mined in Australia each year could produce up to 40 Mt of alumina, which is nearly double our existing production, which in turn could support aluminium output of 20 Mt – more than 13 times current levels.

Additionally, the production of alumina may be able to be leveraged into a new generation of products. For example:

- ▶ As bauxite can contain rare earth elements and other critical minerals such as gallium, there has been an increasing focus in recent years on extracting these valuable metals from bauxite residue produced at alumina refineries<sup>4</sup>. Research into extraction is continuing and could lead to an economic alternative to supplying the metals the world economy needs for producing the technologies that are defining our modern way of life; and
- ▶ High Purity Alumina (HPA) is also emerging as a new market. Many nations now consider high purity alumina a critical mineral, primarily due to its importance in range of technical applications including lithium-ion batteries. However, HPA is only a small market compared to metallurgical grade alumina and its production depends on the existing aluminium value chain.

<sup>4</sup> ARC Centre of Excellence in Synthetic Biology, Rio Tinto Fellowship Explores Metal Recovery From Mining, 18 May 2023.

# Trends in World Aluminium Supply Chains

## Critical role of bauxite supply

Over the past decade, global bauxite production has increased by 50% to meet increasing worldwide aluminium demand. Australia has contributed to this increase, but most of the new supply has come from Guinea, with 430% growth to 100Mt, and China with an 70% increase to 70 Mt.<sup>5</sup>. Notably, approximately 80% of Guinea's production is exported to China and much of it is captive production<sup>6</sup>.

While global bauxite reserves surpass 31 billion tonnes, it is not all accessible due to overlapping environmental and social sensitivities. Complicating matters further, the quality of bauxite ore varies, with impurities rendering many reserves sub-economic for alumina refining. The growth in demand has already led to the mining of these sub-economic resources worldwide, notably in China.

Despite growing bauxite demand, economically viable reserves have only increased by 10% over the past decade, even as primary aluminium production doubled. Ensuring access to quality bauxite resources poses a critical supply chain challenge, compounded by the need to meet the leading practice environmental, social, and governance (ESG) standards.

## Challenges in alumina refining

The landscape of alumina production has undergone substantial changes in the last two decades. China has witnessed a rapid expansion of refining capacity, resulting in a 1,200% increase in alumina output and establishing the nation as the world's largest producer, with a market share exceeding 50%. In contrast, alumina production in North America has fallen by 65% since peaking in 2005<sup>7</sup>.

A significant challenge confronting alumina producer is their commitment to reducing carbon emissions. Alumina processing is an energy-intensive activity that relies on fossil fuel combustion to create steam and heat. While Australia's alumina already has some of the lowest emissions in the world, with an average emissions intensity of 0.7 tonnes of carbon dioxide per tonne of alumina (t CO<sub>2</sub>-e/t), compared to the

global industry average of 1.2 tCO<sub>2</sub>-e/t, rising energy costs have diminish the competitiveness of alumina production in Australia as well as Europe and the United States.

Increasingly, alumina refining is grappling with challenges related to rising resource nationalism. Governments with substantial bauxite reserves are curbing the export of unprocessed bauxite to encourage domestic alumina industry investment. Indonesia, the world's fifth-largest bauxite miner, has already imposed an outright ban on unprocessed bauxite shipments and is attracting significant investment in new alumina refineries from Chinese companies aiming to secure their supply chains.

Despite growing bauxite demand, **economically viable reserves have only increased by 10% over the past decade**, even as primary aluminium production doubled.

## Emerging risks in primary aluminium production

A dependable supply of aluminium is imperative for industrialised nations, given its pivotal role in modern manufacturing. Over the past two decades, there has been a profound shift in the geographic distribution of aluminium production. Figure 4 underscores the growth in China's aluminium production, surging by over 1,300% from around 2.7 Mt in 2000 to over 40 Mt in 2022. Consequently, China now produces 59% of global primary aluminium, a stark increase from just 11% in 2000.

<sup>5</sup> Department of Industry, Science and Resources; World Bureau of Metals Statistics

<sup>6</sup> Department of Industry, Innovation and Science, Resources and Energy Quarterly March 2023; S&P Global, China records higher aluminum, alumina trade with Russia in 2022, 20 January 2023.

<sup>7</sup> International Aluminium Institute website, <https://international-aluminium.org/statistics/alumina-production/>.



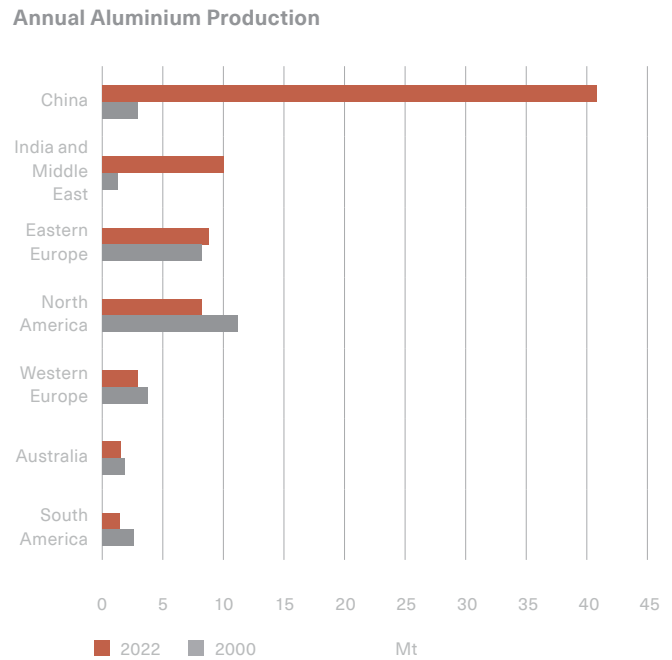
Output in North America and Western Europe has dropped by 38% and 23%, respectively, while Australia's aluminium production has declined by 270 kt (14%) due to the closure of two smelters. Rising energy costs and the availability of cheap imports, sometimes below the cost of production, have been significant contributors to the decline in aluminium output in these countries.

Energy prices, however, remain the most influential factor reshaping aluminium production. Primary aluminium production is inherently energy-intensive, and nations with access to abundant and affordable energy or those willing to offer energy subsidies hold a competitive edge.

**A dependable supply of aluminium is imperative for industrialised nations, given its pivotal role in modern manufacturing.**

Sources: International Aluminium Institute, Department of Industry, Science and Resources, USGS.

**Figure 4: The shifting geographic distribution of primary aluminium production, 2000-2022**



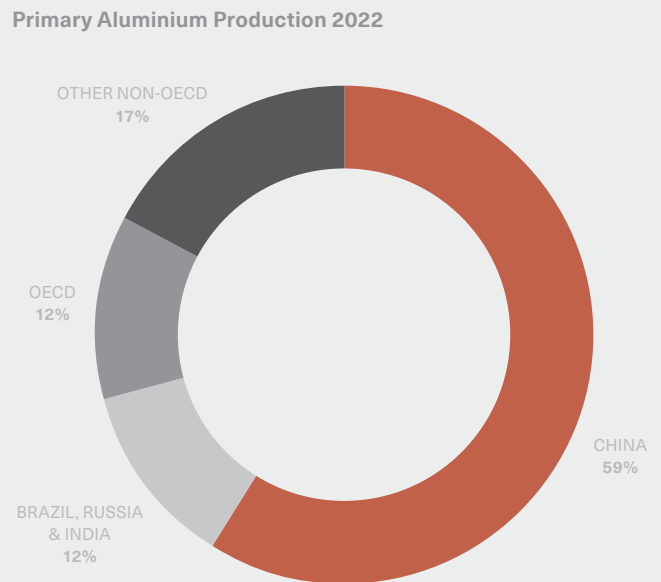
### The geographic shift in the aluminium value chain

One of the most significant consequences of the geographic shift in aluminium production is that supply is now highly concentrated in non-OECD nations, which comprise only 12% global production (Figure 5). This concentration of production within a select group of nations presents a rising challenge for Australia as competitors national policies aim to “reshore” domestic production of many goods, components, and materials to boost their supply chain security.

Few countries possess the capability to manage the entire aluminium production process from mining to smelting, rendering them vulnerable to supply chain risks. The geopolitical uncertainty following Russia's invasion of Ukraine in February 2022 heightened the focus on these risks, with Russia and Ukraine collectively accounting for about 4% of the world's alumina production in 2021. Russia, in particular, is the world's third-largest aluminium producer.

For Australia, this creates a significant opportunity to boost cooperation with our key trading partners – particularly within the Quad alliance. For example, Japanese companies have been integral to the development of Australian bauxite, alumina and aluminium. Consideration should be **development of long-term strategic partnerships with likeminded countries.**

**Figure 5: Emerging geopolitical risks in aluminium production**



Source: United States Geological Survey, Department of Industry, Innovation and Science, International Aluminium Institute.

# Re-Shaping the International Aluminium Market

There are two principal ways government policies support aluminium industries:

- 1 Direct subsidy schemes such as financing programs to reduce investment costs and provide capital for mines, refineries and smelters.
- 2 Demand side support by boosting demand for industries that have high levels of aluminium consumption – vehicle manufacturing and construction in particular.

Both supply and demand side policies can be implemented simultaneously where governments recognise the economic and national security benefits of a domestic aluminium industry.

## China

China's rise in aluminium production has coincided closely with its growing importance in broader manufacturing. Over half of global alumina and primary aluminium smelting capacity is now located in China, which has become the world's leading producer in most segments of the aluminium value chain over the past two decades. This historically unprecedented expansion of production capacity is a result of government policies rather than innovation, process improvements or lower input costs.

A 2019 OECD report on distortions in the global aluminium market found that up to \$70B in government support had been provided to aluminium companies globally in the four year period to 2017 and it is estimated that more than three quarters of this concentrated in Chinese producers<sup>8</sup>. This level of support is not unusual and in proportion to the scale of the Chinese industry. The series of government and non-government support measures have been incredibly successful in building new capacity across the entire value chain. Globally, this has seen trade remedies put in place against imports of Chinese aluminium products, due to trade practice issues.

## The US

The US was once a leader in aluminium production. As recently as the year 2000 it was the world's largest producer of aluminium with output of around 3.7 Mt. Last year this dropped to just 0.8 Mt, or 10th in the world<sup>9</sup>. A series of government policies has attempted to address the situation.

The Obama administration brought a case to the World Trade Organisation on the issue of other governments providing subsidies to their aluminium industries to drive oversupply, lower prices and boost exports. Under the Trump administration a different industry policy approach was implemented and the US resorted to imposing tariffs on aluminium imports, among other goods, to boost domestic supply. This included tariffs on imports from its principal sources of aluminium – Canada and Australia. To date, these have not successfully arrested the decline in production.

The latest policy approach is via the US Inflation Reduction Act which offers a program of tax credits for manufacturers and miners supplying the materials need to expedite the energy transition in the US. This policy works on both the demand and domestic supply side with the expected increase in renewable energy investment to strengthen aluminium while improving the economic feasibility of aluminium production in the US. However, it fails to address one of the core issues that led to the demise of the US aluminium industry – rising energy prices. Electricity prices in most states are at record high-levels and continue to rise and so there considerable uncertainty as to whether the tax credits are sufficient to incentivise smelters to re-open.

The Inflation Reduction Act also allows US companies with investments in countries that have a free trade agreement to still claim the tax credit – which offers significant benefits to the Canadian aluminium sector. Australia also has a free-trade agreement with the US, but with our electricity prices also at high levels will struggle to compete with the low-cost and low-carbon energy supplied to aluminium smelters in Canada.

<sup>8</sup> OECD, Measuring Distortions in International Markets – the Aluminium Value Chain, 2019.

<sup>9</sup> United States Geological Survey, Commodity Summaries 2023.

## Canada

Despite having no significant bauxite reserves of its own, Canada is the fourth largest producer of aluminium. Government policies have played a key role in the emergence of Canada's aluminium industry where these have largely focused on Canada's relationship with the US and providing low-cost low-carbon energy.

Aluminium production is highly concentrated in Quebec where there is abundant low cost hydroelectricity supplied by the state owned public utility, Hydro-Quebec. The government's energy and climate policies are now positioning the local industry as a world-leader in sustainable aluminium production. The carbon intensity of Canada's primary aluminium production is about 60% lower than the global average and just one-sixth of aluminium produced in China<sup>10</sup>.

For manufacturers committed to fostering sustainable supply chains and reducing their carbon emissions, Canada's aluminium is in high demand. Major manufacturing companies including Apple, BMW and Ford have already signed supply agreements with Rio Tinto to source its low-carbon aluminium produced in Canada and further deals are likely to develop in the future.

Canada's strong competitive advantage in producing low-cost, low-carbon energy to support aluminium smelting has been bolstered further with the Made in Canada Plan. In its 2023 budget, the Canadian Government has implemented a 15% tax credit for investments in non-emitting electricity generation systems, energy storage projects and transmission developments. The tax credit extends to public utilities such as Hydro Quebec that supplies electricity to aluminium producers in Canada.

The Made in Canada Plan also provides the Clean Technology Manufacturing Investment Tax Credit which can deliver a tax credit equal to 30% of the cost of new capital equipment used in the processing of metals on Canada's critical minerals list – which includes aluminium.

Canada is also uniquely positioned to supply aluminium to the US and around 80% of its production is shipped there<sup>11</sup>. This trade relationship is the result of a century of government agreements that at first supplied aluminium during World War 2, and then continued to support the post-war growth in the US automobile, consumer goods and construction industries.

In its 2023 budget, the Canadian Government has implemented a 15% tax credit for investments in non-emitting electricity generation systems, energy storage projects and transmission developments.

The North American Free Trade Agreement and its successor the US-Mexico-Canada Agreement (USMCA), have also provided greater access for Canadian aluminium producers to the US market. Under USMCA 70% of all aluminium used in the production of automobiles must originate in North America<sup>12</sup>.

The Made in Canada Plan also provides the **Clean Technology Manufacturing Investment Tax Credit** which can deliver a **tax credit equal to 30% of the cost of new capital equipment used in the processing of metals on Canada's critical minerals list – which includes aluminium.**

## Gulf Cooperation Council

Several nations in the Middle East have established booming aluminium industries in the last two decades. Though not on the same scale as China, production in the UAE and Bahrain now surpasses Australia. Government policies promoting economic diversification have played a pivotal role in the emergence and growth of these industries. While most aluminium production is owned by private companies, these companies tend to be backed or owned themselves by state-owned investment groups that can provide significant capital from government oil and gas royalties.

State supported electricity contracts have also played a key role in the success of the aluminium sectors in Gulf Cooperation Council members. This region has some of the lowest energy prices in the world, albeit with energy sourced from fossil fuels. The region is, however, able to increasingly use the abundance of local flexible gas to firm variable renewables.

<sup>10</sup> Global Efficiency Intelligence website.

<sup>11</sup> Congressional Research Service, US Aluminium Manufacturing: Industry Trends and Sustainability, October 2022.

<sup>12</sup> Office of the United States Trade Representative, Report to Congress on the Operation of the United States-Mexico-Canada Agreement with Respect to Trade in Automotive Goods, July 2022.

# Policy Agenda to Boost Australia's Aluminium Industry

## Lessons for Australia

The aluminium sector's development in Australia and globally has, been heavily driven by government policy. The immediate challenge for Australia is to ensure existing mines, refineries, smelters and extrusion presses, do not close. If these facilities are lost during the energy transition, the opportunity for Australia to grow as a clean energy producer of alumina and aluminium will be lost as the skills and infrastructure will not be rebuilt. With the right policy settings we both retain our existing industry and capture more of the opportunities offered by growth in the international aluminium market.

## Policy priorities

The aluminium industry should be a fundamental sector the government targets to boost Australian economic growth and enhance our cooperation with trading partners. Five key policy actions are needed for this to occur.

### 2. Australia must be sufficiently competitive to be able to attract global decarbonisation investment.

Capital follows the strongest investment signals and Australia's signals are currently too weak to attract globally relevant industrial and manufacturing investment. Industry needs two key policies in to be an attractive destination for industrial abatement to take place:

- ▶ **Production Credits.** This policy pathway is being used effectively in a range of jurisdictions, including the US, China, India and Europe, to incentivise production of low carbon products and inputs into the clean energy supply chain. The credits are typically priced in a manner that bridges the relevant regional or global green production premium, through an implied cost of carbon required to support investment. The policy should be specifically relevant to aluminium metal production and could be doubly incentivised into domestic downstream manufacturing, such as extrusion; solar panel production etc.

### 1. Deliver internationally competitive supplies of clean energy.

Alumina refining and aluminium smelting are both energy intensive. For Australia to build on its existing aluminium asset base, internationally competitive clean energy supplies are essential. As Australia's electricity supply moves towards cleaner forms of power generation, Federal and State governments need to ensure sufficient internationally competitive power supplies are available for industry.

Underpinning this is the need for associated power infrastructure being available when required including transmission lines which will require substantial capital investment from governments.

This investment should be complemented by market mechanisms which support the integration of industrial facilities to a clean energy grid.

- ▶ **Transformational Infrastructure and Technology Funding.** The Government's existing grant funding through the Powering the Regions Fund is currently two orders of magnitude smaller (relative to GDP) than similar programs in other jurisdictions like Canada, Europe and Japan. The scale being offered must be significantly increased with a fixed commitment to co-fund 50% of all green industrial capital investment across existing and new assets for both on and off-site investment. This will allow industry to then cost efficiently and competitively demonstrate technological innovation and deliver regional infrastructure upgrades, such as transmission.

This would be particularly relevant for the alumina industry, where the principal barriers to decarbonisation are:

- ▶ the capital cost of on-site transformation to low carbon production methods; and
- ▶ the need to upgrade regional electricity infrastructure to deliver the requisite energy to the sites in a low margin mid-stream industry.

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3. Prioritise the Australian aluminium value chain (bauxite, alumina, high purity alumina, aluminium, and extrusion) within industry development policies – both as a critical mineral and in manufacturing.

As Canada, USA, Europe and many other regions have done, the recognition of the aluminium supply chain as part of the critical mineral policy framework reflects the sector's importance to the jurisdiction. In the Australian context, aluminium is one of only two metals where the full supply chain is already established.

In the coming years Australia needs to not only retain the existing industry, but expand it to meet increasing global demand. Supporting this, Australia's manufacturers need free and fair trade, underpinned by robust anti-dumping system, to be able to compete.

By officially prioritising the existing aluminium supply chain, the Australian government will send a clear signal to investors that not only does it value the sector, but that Australia should be the investment destination of choice.

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4. Environmental approval processes that appropriately balance the need for environmental rigour and protection with timelines that reflect commercial needs.

Current environmental approval processes challenge both brownfield and greenfield developments across all aspects of the resources and energy sectors, irrespective of technology. Parallel processes run by Federal and State governments can be difficult to navigate and must be simplified and streamlined without reducing standards.

There is a need for appropriately balanced approval processes that ensure environmental outcomes are maintained while also providing certainty on timelines to reduce financial risk. This applies to resource projects and the energy projects required to underpin the transition.

As a leader in sustainable mining practices, the aluminium industry supports regulations that meet the highest standards of environmental protection. Approval processes must reflect the commercial realities of long-life capital-intensive projects and provide efficient pathways for projects seeking approvals without diminishing regulatory standards. Failure to do so will see projects and production move offshore, often to countries with much lower environmental standards.

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5. Foster long term strategic partnerships with likeminded countries to meet their demand for critical minerals and metals, including aluminium.

As a major producer of most commodities, Australia is ideally placed to work with its strategic allies in meeting their demand. We are a trading nation that owes much of our prosperity to our ability to both import and export goods, services, and capital. All of which are needed to grow our aluminium industry.

Building on existing long term strategic relationships, such as formalised by the Critical Minerals Partnership, the Australian government should actively engage with like-minded allies in pursuing investment in the aluminium sectors. Attracting investment from and partnering with these allies will help ensure the Australian aluminium sector grows to meet increasing global demand.

