AUSTRALIAN
ALUMINIUM
COUNCIL LTD

Level 1,
18 National Circuit
Barton ACT 2600
Ph: 02 6267 1800
info@aluminium.org.au

Critical Minerals Facilitation Office
Department of Industry, Science and Resources
Via https://consult.industry.gov.au/updating-australias-critical-minerals-list-issues-paper
17 August 2023

Dear Minister

Australian Aluminium Council Response to Critical Minerals List Issues Paper

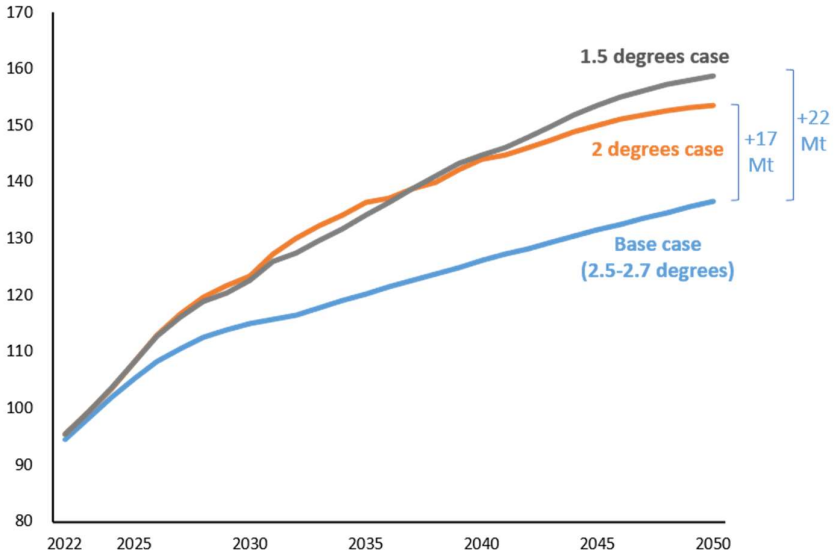
The Australian Aluminium Council (the Council) represents Australia's bauxite mining, alumina refining, aluminium smelting and downstream processing industries. The aluminium industry has been operating in Australia since 1955, and over the decades has been a significant contributor to the nation's economy. It includes six bauxite mines which collectively produce over 100 Mt per annum making Australia the world's largest producer of bauxite. Australia is the world's largest exporter of alumina with six alumina refineries producing around 20 Mt per annum of alumina. Australia is the seventh largest producer of aluminium, with four aluminium smelters and additional downstream processing industries including more than 20 extrusion presses. Aluminium is Australia's highest earning manufacturing export. The industry directly employs more than 19,000 people, including 6,600 full time equivalent contractors. It also indirectly supports around 60,000 families predominantly in regional Australia.

The Council welcomes the opportunity to provide feedback to the Australia's Critical Minerals List Issues Paper (the Paper), following the release of the Government's updated Critical Minerals Strategy in July 2023[1]. In responding to the Paper, the Council recognises that the Government will consider views already communicated in its February 2023 submission[2] to the Strategy. The Council supports the need to update the List, which was last updated in early 2022 to reflect evolving markets and geopolitical issues. Australia's Critical Minerals List must remain current to ensure it reflects the current global context and can flexibly evolve over time.

The 2023 Strategy reaffirmed that metals such as aluminium, nickel and copper, in combination with rare earths, are essential inputs into the technologies that will drive the energy transformation, and ones where Australia produces significant quantities. Aluminium is one of the commodities most widely used in the global transition to a clean energy future[3]. It is also recognised for its importance to both economic development and low emissions transition. Aluminium use is highly correlated with GDP, so as countries urbanise, per capita use of aluminium increases. It is expected that by 2050, global demand for aluminium is expected to nearly double[4] (Figure 1). While an increasing proportion will be met through recycled aluminium, there will still be a need for increased production of primary aluminium requiring a comparable increase in global bauxite mining and alumina refining rates.

[1] https://www.industry.gov.au/sites/default/files/2023-06/critical-minerals-strategy-2023-2030.pdf
[2] https://aluminium.org.au/wp-content/uploads/2023/02/230203-Aluminium-Critical-Minerals-Strategy-Submission.pdf
[3] https://www.worldbank.org/en/topic/extractiveindustries/brief/climate-smart-mining-minerals-for-climate-action
[4] International Aluminium Institute High Substitution Scenario

Figure 1. Aluminium Demand (Mt)[5]



Source: Wood Mackenzie Consulting (July, 2022)

However, producing substantial quantities today, does not mean supply chains are not vulnerable to change. The Council has focused its response in this submission on the five consultation questions posed in the Paper. In its responses, the Council has focused on the aluminium supply chain and in general has not provided comment on other minerals (i.e., commentary on other minerals to include or exclude).

1. Is the current set of criteria still fit for purpose? The Critical Minerals List currently includes minerals:

- **essential to modern technologies, economies and national security**
- **whose supply chains are vulnerable to disruption**
- **that our strategic partners need; and**
- **for which Australia has potential economic geological resources.**

The Council believes the current criteria are fit for purpose; however, care needs to be taken in the interpretation of these criteria. The Council believes that bauxite, alumina and aluminium can meet these existing criteria, and that perhaps it has been a different interpretation of how these criteria are applied which has led to them not being included in past reviews. Additionally, changing geopolitical undercurrents have provided increased evidence that supply chains previously considered to be stable are, in fact, vulnerable and prone to rapid changes in dynamics.

2. For minerals that are currently on the list, or minerals that should be considered for addition to or removal from the list

The Council believes that Australia's aluminium value chain (bauxite, alumina and aluminium), as well as High Purity Alumina (HPA), should be considered as part of Australia's next update to its Critical Minerals List. Bauxite can be used to produce alumina which in turn makes primary aluminium, as well as a range of other derivatives, including High Purity Alumina (HPA).

2a. Which technologies does the mineral feed?

Bauxite, alumina and aluminium are essential to modern technologies, economies and national security

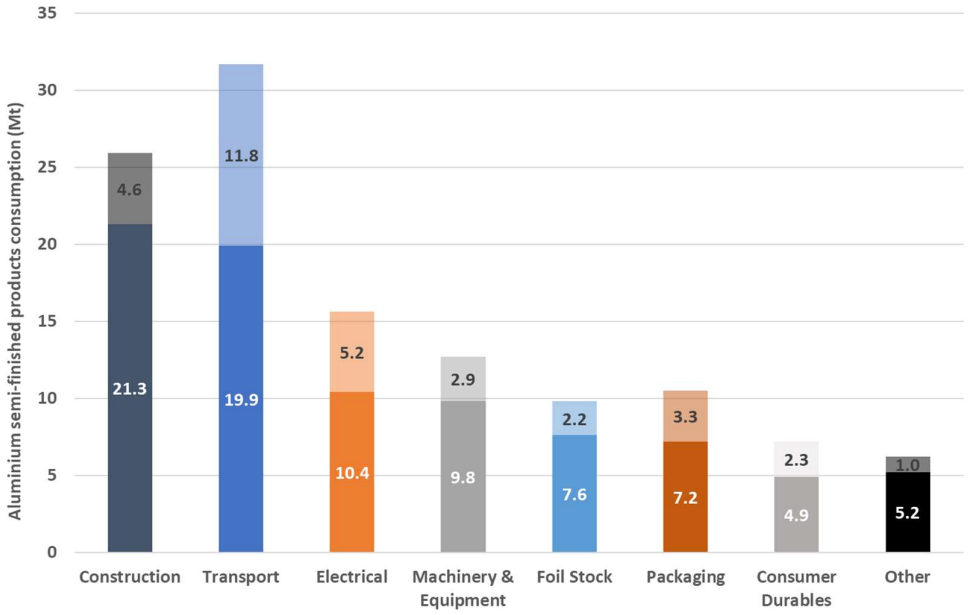
Aluminium is strong, durable, flexible, impermeable, lightweight, corrosion resistant and 100% recyclable. Because of its versatility aluminium is used in the construction and building, defence, aerospace, electricity and transportation sectors, with demand increasing. As noted by the United States Geological Service (USGS)[6], aluminium is used in almost all sectors of the economy. Electrification of transport and deployment of

[5] Alumina Limited, Sep 2022

[6] https://www.usgs.gov/news/national-news-release/us-geological-survey-releases-2022-list-critical-minerals

renewable energy technologies will increase demand for primary aluminium. Although recycling aluminium is part of future supplies, the volume of secondary output will not be sufficient to meet rising demand for many decades, and indeed probably this century. There is an increasing global gap between demand and secure supply.

Figure 2. Aluminium semi-finished products consumption, 2020 vs 2030, Mt (Credit CRU[7])



Clean Energy Supply Chains (including batteries and hydrogen)

The International Energy Agency (IEA) forecasts[8] that total mineral demand from clean energy technologies is expected to between double and quadruple by 2040. Aluminium and copper are the critical minerals identified by the IEA as most widely needed for these technologies (Table 1). In the coming decades, where these critical minerals are sourced and how they are produced will have deep impacts on national security and competitiveness[9].

Minerals are a critical enabler of the net-zero transition, but supply of some materials required may be limited at times, due to global supply chains. This may also result in substitution between materials which may result in rapid changes in market dynamics. For example, while copper is usually the material of choice in electrical wiring given its high electrical conductivity, there are certain applications for which aluminium has a better cost performance. For this reason, most overhead transmission lines are made from aluminium instead of copper because its lower weight allows a larger distance between pylons and, consequently, a lower systems cost. Depending on relative pricing and supply between the two markets, there can be shifting between the commodities[10]. However, predicting the outcomes of domestic policies in countries with high concentrations of these commodities as well as a rapidly changing regulatory landscape, such as the US Inflation Reduction Act (IRA) and the EU Green Deal Industrial Plan, could affect regional supplies of materials, even when the global market is balanced.

[7] https://international-aluminium.org/resource/opportunities-for-aluminium-in-a-post-covid-economy/
[8] https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions
[9] https://safe2020.wpenginepowered.com/wp-content/uploads/2023/03/SAF-CritMinReport_v06.3_Spreads_Final.pdf
[10] https://www.mckinsey.com/industries/metals-and-mining/our-insights/the-net-zero-materials-transition-implications-for-global-supply-chains

Table 1. Critical mineral needs for clean energy technologies

	Copper	Cobalt	Nickel	Lithium	REEs***	Chromium	Zinc	PGMs**	Aluminium
Solar PV									
Wind									
Hydro									
CSP*									
Bioenergy									
Geothermal									
Nuclear									
Electricity Networks									
EVs and Batteries									
Hydrogen									

* CSP – Concentrated solar power, ** PGM – Platinum Group Metals, *** REEs – Rare Earth Elements
Shading indicates relative importance of minerals for a particular clean energy technology

A recent report by the World Bank[11] demonstrates that not only is aluminium a critical component of many low-carbon technologies needed for the energy transition, such as batteries, carbon storage for low-carbon hydrogen, or wind turbines, but there are supply chain risks to solar photovoltaic (PV) technologies. Without aluminium there is no solar power as it accounts for over 85 percent of the metal in solar PV. The report concludes that the aluminium market is volatile and aluminium producers around the world face very significant challenges to remain competitive and/or enter the market.

This is consistent with experiences in Australia where the challenging market conditions currently facing the industry, including domestic carbon costs and the capital requirements for decarbonisation have led to the impairment of some Australian alumina refineries[12]. That said, there remains a focus on pursuing decarbonisation of the value chain at these facilities[13]. The bauxite, alumina, aluminium supply chain is becoming increasingly vulnerable and its status is at risk.

As articulated in the Government's National Battery Strategy Issues Paper[14], Australia has the world's second largest demonstrated battery mineral resources for bauxite (aluminium ore). Bauxite can be used to produce both primary aluminium which can be used directly for battery technologies[15] and a range of other derivatives, including High Purity Alumina (HPA).

Essential to Australia's Economy

Australia's aluminium industry contributes around $15B[16] a year to the economy in export value. Australia is one of the very few countries which has bauxite mining, alumina refining, aluminium smelting and aluminium

[11] https://www.worldbank.org/en/topic/extractiveindustries/publication/competitiveness-of-global-aluminum-supply-chains-under-carbon-pricing-scenarios-for-solar-pv
[12] 2023 Half Year Results - https://www.riotinto.com/en/invest/financial-news-performance/results
[13] https://www.riotinto.com/en/news/releases/2023/rio-tinto-and-sumitomo-to-build-gladstone-hydrogen-pilot-plant-to-trial-lower-carbon-alumina-refining
[14] https://consult.industry.gov.au/national-battery-strategy-issues-paper
[15] For example https://www.afr.com/companies/energy/shell-backs-australian-energy-storage-disruptor-20230217-p5clhh and https://graphenemg.com/energy-storage-solutions/aluminum-ion-battery/.
[16] https://www.industry.gov.au/publications/resources-and-energy-quarterly-june-2023

extrusion industries, making aluminium one of the few commodities in which the raw materials are mined and are processed all the way to a consumer product right here in Australia. However, there is an opportunity to leverage this existing industry further. The bauxite mined in Australia produces around 20 Mt of primary aluminium; more than 13 times Australia's current production. So, while the existing aluminium industry in Australia is a successful example of vertical integration, it is far from being at capacity and there is economic opportunity for Australia to be gained under the right policy conditions. Conversely, the current capacity remains vulnerable to geopolitical risk.

Aluminium and National Security

Since the second world war, governments around the world have understood the importance of the aluminium industry for national security. Aluminium is widely used in defence applications due to its strength to weight ratio, corrosion resistance, conductivity and application to many technologies. The *Australian Aluminium Act* was passed in 1944 primarily to overcome the difficulties of importing aluminium during wartime. What is now known as the Bell Bay aluminium smelter in Tasmania commenced production, as the first smelter in the southern hemisphere, under the name the Australian Aluminium Production Commission in 1955. The US *Defense Production Act 1950* Title III recognises the role of critical inputs, such as aluminium, and was most recently invoked in 2022[17]. The 2022 ban on export of all aluminium ores from Australia to Russia was linked to Russian military use of aluminium in Ukraine[18].

2b. What evidence is there of supply chain disruption relating to those minerals?

The bauxite, alumina and aluminium supply chains are vulnerable to disruption

Vulnerability is a constantly evolving state. While there can be signs that some supply chains are vulnerable to disruption, sometimes the onset can be so rapid that taking action only after a supply chain is identified as "vulnerable" may be too late. In consideration of its response to the Paper, the Council has considered that there are many different interpretations of supply chain vulnerability which have been applied by governments over time. For example, in 2021 the Productivity Commission [19]completed a report into Vulnerable Supply Chains, which considered the factors which make supply chain vulnerable, including geopolitical, environmental, economic, societal and infrastructure related. The Commission's framework focused on vulnerable, essential and critical and concluded that while few imports were vulnerable, export industries such as these have a much higher vulnerability to factors outside the control of the Australian Government or indeed companies operating within Australia.

Concentrated Supply Chains

Concentrated supply chains increase the risks of vulnerability outside Australia's control. For example, Table 2 shows Australia is positioned as the world's largest producer of bauxite and second largest producer of alumina.

Table 2. Top 5 Bauxite, Alumina and Aluminium Production Rankings 2022 (%)[20]

Ranking	Bauxite	Alumina	Aluminium
1	Australia, 28%	China, 58%	China, 59%
2	Guinea, 24%	Australia, 13%	India, 6%
3	China, 20%	Brazil, 8%	Russia, 5%
4	Brazil, 9%	India, 5%	Canada, 4%
5	Indonesia, 6%	Russia, 2%	UAE, 4%

However, this static view does not show that, just over 20 years ago, Chinese domestic production was approximately 11% of global capacity (Figure 3, Figure 4) and was largely vertically integrated with their

[17] https://safe2020.wpenginepowered.com/wp-content/uploads/2023/05/SAFE_Legislative-Analysis_May-2023.pdf
[18] https://www.smh.com.au/national/foreign-minister-payne-accuses-russia-of-committing-war-crimes-20220320-p5a69o.html
[19] https://www.pc.gov.au/inquiries/completed/supply-chains/report
[20] Data supplied by Department of Science, Industry and Resources and presented in https://aluminium.org.au/wp-content/uploads/2023/04/230404-FACTSHEET-TRADE-AND-COMPETITIVENESS-UPDATE-MARCH-2023.pdf

domestic bauxite supply and alumina production. The growth in capacity in China was largely driven by the development of captive coal resources to produce and supply power, particularly in Western China, subsidising prices to the aluminium industry[21]. Today, China's domestic aluminium and alumina production represents 58% of the global industry. China also imports 83% of global bauxite exports , including 98% of Australia's bauxite exports and Guinea, as the world's largest exporter of bauxite, exports principally to China, including from some captive bauxite mines. It is this dominance in other industries which has triggered efforts in other minerals, such as rare earths, for re-shoring of domestic production.

Figure 3. Global Primary Aluminium Production 1973-2022[22]

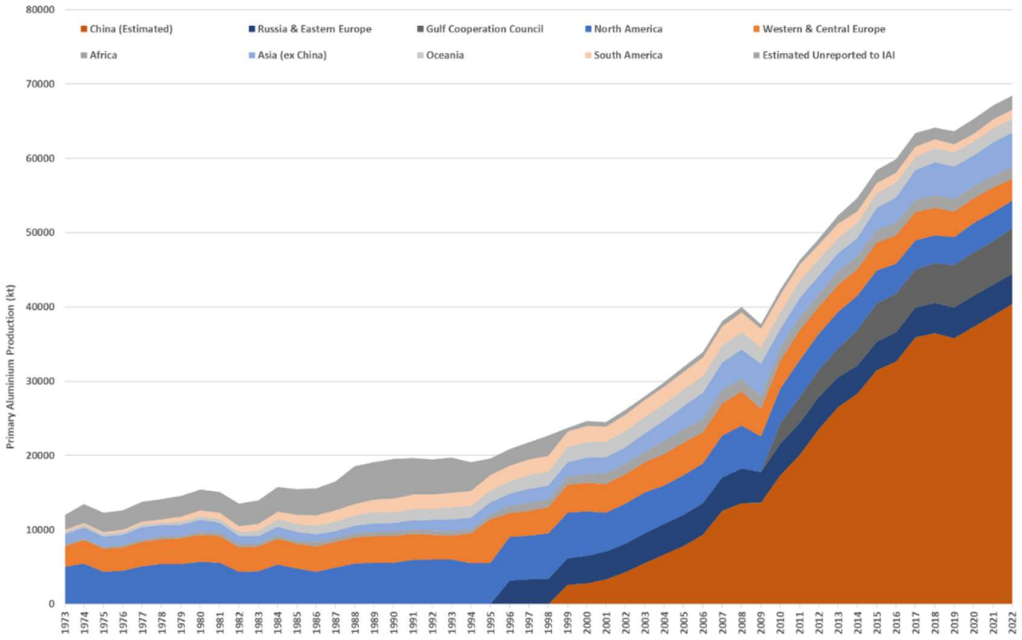
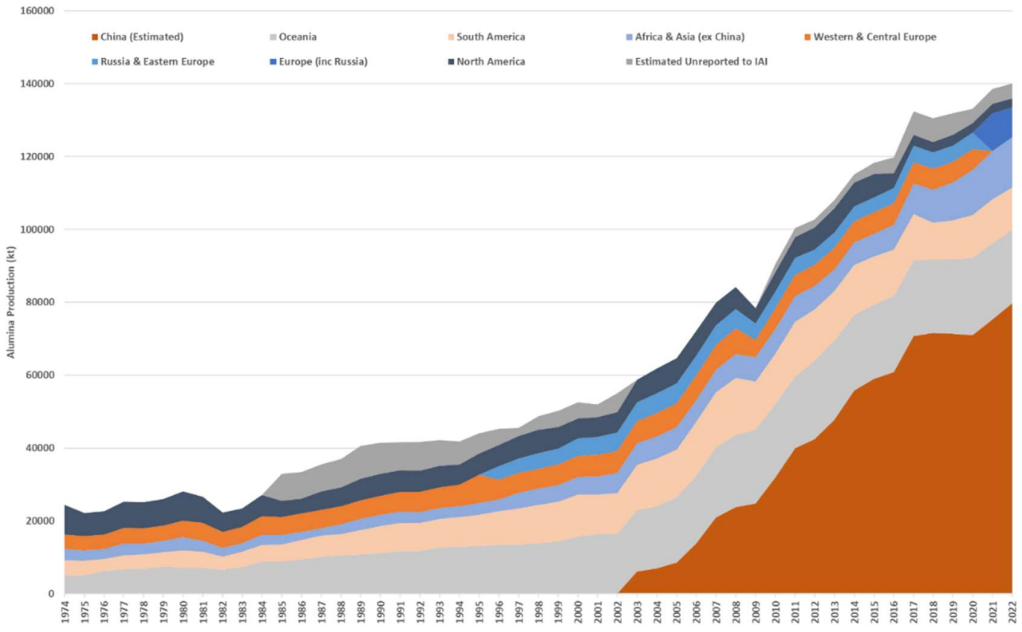


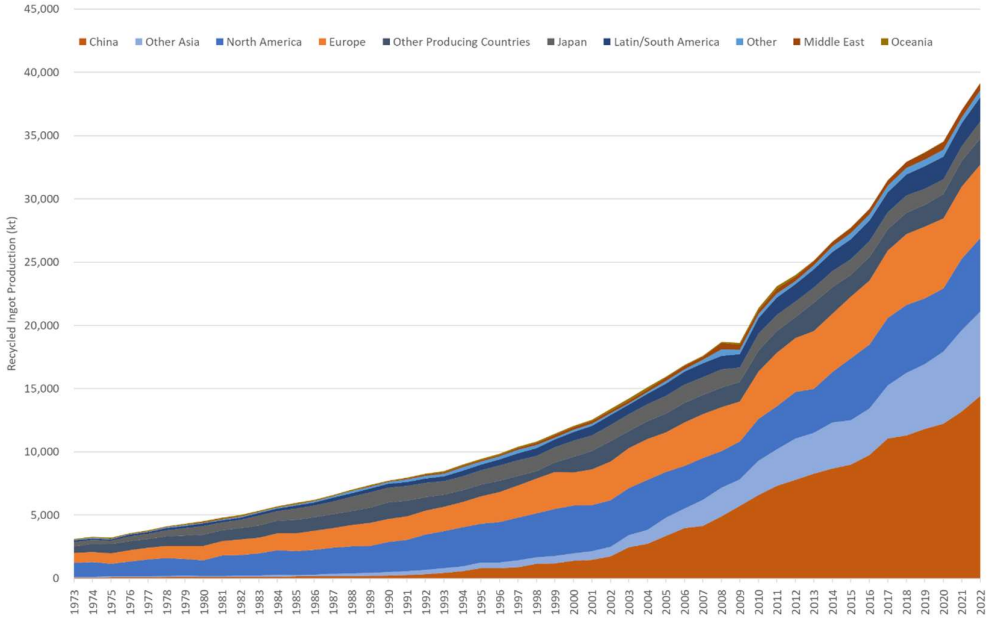
Figure 4. Global Alumina Production 1974-2022[23]



[21] P23, https://www.antaike.com/uploadfiles/20120619/20120619154217370 61.pdf
[22] https://international-aluminium.org/statistics/primary-aluminium-production/
[23] https://international-aluminium.org/statistics/alumina-production/

Increasingly in the future recycled aluminium will also be a key international measure of production and China already produces almost 40% of global recycled ingots (Figure 5). Oceania, which includes Australia and New Zealand, produces <0.1%.

Figure 5. Global Recycled Ingot Production 1973-2022[24]



Vulnerability increasingly exposed since February 2022

While the vulnerability in the aluminium supply chain has been growing, this has increasingly been exposed since February 2022. Prior to the Russian invasion of Ukraine, the Ukraine was one of the world's largest producers and exporters of alumina[25] and Russia was a major importer of Australian alumina. Following the introduction of the Australian trade ban[26,] Russia now sources the majority of its alumina from China and is also planning to increase its own alumina refining capacity[27]. The new refinery will be supplied with bauxite from Russian owned mines in Guinea, the world's second largest producer of bauxite. The Russian invasion of Ukraine not only directly impacted supply chains, but also energy markets further disrupting global alumina and aluminium production, particularly those in Europe[28].

Recent analysis by the Organisation for Economic Co-operation and Development (OECD) highlighted that the aluminium industry is exposed to highly concentrated trade relationships which lack diversity and are therefore highly vulnerable to supply chain risks[29]. Despite being a major producer, as part of this connected global supply chain, Australia's bauxite, alumina and aluminium value chain is not immune to uncertainty and supply chain risk.

[24] Data supplied by International Aluminium Institute

[25] https://aluminium.org.au/wp-content/uploads/2022/09/221214-TRADE-AND-COMPETITIVENESS.pdf

[26] https://www.trademinister.gov.au/minister/dan-tehan/media-release/australia-impose-tariff-increases-all-imports-russia

[27] https://www.reuters.com/markets/commodities/russias-rusal-build-new-alumina-refinery-near-st-petersburg-kommersant-2023-06-15/

[28] https://www.usitc.gov/publications/332/executive_briefings/russia_and_aluminum_supply_chains.pdf

[29] https://www.oecd.org/ukraine-hub/policy-responses/the-supply-of-critical-raw-materials-endangered-by-russia-s-war-on-ukraine-e01ac7be/

2c. What market, financing, technical or other barriers affect these supply chains?

Our strategic partners need bauxite, alumina and aluminium.

Without mining, the world cannot reach net zero by 2050, and the minerals required to achieve our decarbonisation goals are of such magnitude that to reach net zero, we will need more mining, not less. While seeking to maintain Australia's highest standards for ESG, it is also worth considering that global demand will continue to be met from elsewhere if not provided by Australia.

Other countries include a much broader definition, for example Canada[30], USA[31], Europe[32] and China[33] identify bauxite (aluminium ore) and aluminium as critical, as it is the second most widely used metal and also essential for clean energy technologies. Australia should be a supplier of choice to our partners, allies and emerging markets like the United States, the United Kingdom, Japan, Korea, India and the European Union.

Key allies, such as the Unites States have identified vulnerabilities in the aluminium supply chain[34]. USA which was only 25 years ago the world's largest producer of aluminium is no longer in the top 10 producing nations (Table 3). The USA has historically relied on domestic production combined with imports from Canada, Russia, UAE and China; declining domestic production in the US means in the future US reliance on non-allied supply will continue to grow.

Table 3. Top Primary Aluminium Producing Countries at 5 Yearly Intervals (1997-2022)[35]

Rankings	1997	2002	2007	2012	2017	2022
1	USA	China	China	China	China	China
2	Russia	Russia	Russia	Russia	Russia	India
3	Canada	Canada	Canada	Canada	Canada	Russia
4	China	USA	USA	USA	India	Canada
5	*Australia*	*Australia*	*Australia*	*Australia*	UAE	UAE
6	Brazil	Brazil	Brazil	UAE	*Australia*	Bahrain
7	Norway	Norway	Norway	India	Norway	*Australia*
8	Venezuela	India	India	Brazil	Bahrain	Norway
9	Germany	Germany	UAE	Norway	Saudi Arabia	Malaysia
10	India	Venezuela	Bahrain	Bahrain	Brazil	Saudi Arabia

The US Department of Energy highlights that they believe the supply risk for aluminium is increasing in the medium term (2025-2035)[36]. While the US used to be a dominant producer of primary aluminium, its capacity is now around half of that of Australia and, as such, it is short in aluminium for its manufacturing needs, importing around 30% of global aluminium production in 2022. While Australia exports around 160kt (10% of national production) to the US there are opportunities to increase this relationship in the context of the Climate, Critical Minerals and Clean Energy Transformation Compact[37]. The US IRA specifically highlights aluminium[38] as a key sector; in addition to aluminium being defined as a Critical Mineral in the US. However, the inconsistency between national definitions jeopardises the ability of Australian industry to leverage this important relationship.

[30] https://www.canada.ca/content/dam/nrcan-rncan/site/critical-minerals/Critical-minerals-strategyDec09.pdf
[31] https://www.usgs.gov/news/national-news-release/us-geological-survey-releases-2022-list-critical-minerals
[32] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0474
[33] https://www.iea.org/policies/15519-national-plan-for-mineral-resources-2016-2020
[34] https://safe2020.wpenginepowered.com/wp-content/uploads/2023/02/The-U.S.-Aluminum-Industrys-Energy-Problem-and-Energy-Solution.pdf
[35] Data supplied by Department of Industry, Science and Resources
[36] https://www.energy.gov/cmm/what-are-critical-materials-and-critical-minerals
[37] https://www.whitehouse.gov/briefing-room/statements-releases/2023/05/20/australia-united-states-climate-critical-minerals-and-clean-energy-transformation-compact/
[38] https://www.whitehouse.gov/wp-content/uploads/2022/12/Inflation-Reduction-Act-Guidebook.pdf

While Australia currently exports aluminium to the US in the form of primary aluminium, there are opportunities for further manufacturing prior to export. For example, aluminium accounts for more than 88% of the metal in a solar panel. The aluminium frame and rail are examples of extrusions which can be made using existing manufacturing capability in Australia. For every GW of solar PV, 5.5 kt of aluminium extrusion is needed for frames and for every GW of rooftop solar, an additional 13 kt of aluminium extrusion is needed for rails and mountings. Aluminium frame and rail can be reused or recycled if circularity is considered in design. Installed solar in Australia will need more than 1.5 M tonnes of aluminium extrusion by 2050, creating a substantial increase in demand for both aluminium and extrusions. But today more than 70% all semi-finished aluminium used in Australia is imported and <3% of Australian extrusion capacity is supplied as solar rail and none as solar frame. Leveraging opportunities under the National Renewable Energy Supply Chain Action Plan for Australian aluminium to be used in the development of a solar PV industry could see Australian bauxite being exported to the US not only as primary aluminium but also in the future as Australian-made solar panels.

Bauxite can be part of Australia's market advantage, if its status as a critical mineral is addressed.
While Australia cannot outspend the US IRA, Australia brings its strategic bauxite resources to the partnership. Australia is currently the world's largest producer of bauxite and has 22% of global reserves. Guinea has 27% of global reserves, is the world's second largest producer of bauxite, including some captive Chinese-owned bauxite mines and is the world's largest exporter of bauxite, principally to China. Whilst Western world production has been falling, China has secured its supply of bauxite by significant investment in bauxite mines in Guinea and has closed high cost refineries and smelters which have been replaced by low cost producers built on the coast to reduce freight costs. Australia's mineral exports, such as bauxite and alumina, rely on bulk freight which has also undergone a step change in its volatility, exposing the industry to vulnerabilities.

Historically, Australia has been able to compete against Chinese alumina and aluminium on cost, that advantage has deteriorated materially in recent years. Seventeen[39] new refineries (28 Mt of capacity) will be added globally between 2021 and 2026, primarily in China and Indonesia[40], and all sourcing their energy from coal. This new production will suppress the price of alumina, reducing the capacity of Australian refineries to economically fund their decarbonisation.

The ability of Australian miners to continue to navigate Commonwealth and State environmental approvals to access bauxite, risks impacting the ability to continue to grow a green aluminium manufacturing sector. It has been forecast that under the reforms to the Environment Protection and Biodiversity Conservation (EPBC) Act, critical minerals will be treated differently to "non-critical" minerals. While seeking to maintain Australia's highest standards for ESG, it is also worth considering that global demand will continue to be met from elsewhere if not provided by Australia. This may increase the net global impact of mining, compared with continued development in Australia. The long term future for the sector in Australia is positive but it is under near term stress. Recognition as a critical mineral will help the vertically integrated industry attract investment, not only to decarbonise, but to position itself for long term forecast growth.

2d. Are the barriers or supply chain disruption risks more acute in certain applications or levels of mineral grade or purity than others?
The Council believes that Australia's aluminium value chain (bauxite, alumina and aluminium) should all be considered as critical minerals. While some of Australia's peers list bauxite and some list aluminium. Australia has demonstrated interlinked vulnerabilities across the supply chain.

For example, the integrated nature of bauxite mining, alumina refining, aluminium smelting and extrusion processes in Australia means that efficient and effective regulatory processes for each step are critically important to the ongoing operation of the overall system. Currently, issues with mining approvals for the

[39] Finding Better Ways – Decarbonising our Australian alumina refineries, Rio Tinto 2023
[40] https://www.spglobal.com/commodityinsights/en/market-insights/blogs/metals/031723-southeast-asia-may-hold-the-key-to-chinese-aluminum-smelters-production-woes

adequate supply of bauxite from mines in Western Australia means that Kwinana Alumina Refinery is partially curtailed[41].

3. Should Australia differentiate between criticality or importance of minerals, and the capability to process them, through categories within the list or a separate category that sits alongside the list? This differentiation could reflect the size and maturity of markets and the different challenges or barriers faced. Other countries have recognised value in establishing different categories or separate lists where minerals are prioritised (refer to Attachment A). This differs from Australia's current approach and suggests that other lists are intended to serve multiple purposes (for example, to meet specific policy or research needs).
Appendix A of the Paper indicates that Canada has two sub-categories within its critical minerals list – a group of 6 minerals that hold the most potential for Canadian economic growth and will be the focus of most federal investment and the second category captures 25 other minerals that present significant prospects for the future. However, the Council infers from P42-44 of the Canadian Critical Minerals Strategy[47] that there in fact three categories:

1. Six critical minerals which are priorities for economic growth today,
2. Nine with significant prospects for the future; and
3. Three, including aluminium, where Canada already has capacity but must maintain its existing position as a world leader.

The strategy to maintain existing capacity is different to that required to develop economic growth today.

Australia adopting a differentiated strategy for its critical minerals may help alleviate some concerns which have been raised with the Council about the addition of new minerals to Australia's list, particularly with regard to Critical Minerals Development Program funding, which targets early- to mid-stage critical mineral projects. While the Council agrees that this funding is appropriate for critical minerals, including HPA which are prospects for economic growth today, the supporting strategies for existing, but still vulnerable, supply chains like bauxite, alumina and aluminium are different.

4. What lessons could be learned from other countries' approaches or the ways in which they consider their criteria for listing critical minerals?
When comparing Australia's approach with other countries', it is worth noting that it is Australia's wealth of natural mineral resources, including bauxite, which create a differentiated strategic opportunity compared to, say, the United Kingdom which has only one remaining primary aluminium producer, producing only 40kt per annum[42].

Australia's current variety of critical minerals lists is the cause of confusion:

- CSIRO's Critical Mineral's Roadmap[43] includes aluminium, nickel and copper;
- The Queensland Government lists[44] bauxite as the resource and aluminium as the metal;
- The recent address by the Prime Minister[45] to the Sydney Energy Forum included aluminium in the list of critical minerals.

Therefore, other countries and agencies are already confused as to the status of aluminium in Australia with the IEA[46] and Canada[47], including aluminium as already designated as a critical mineral in Australia. Having a single consolidated and comprehensive list, including bauxite, alumina and aluminium, rather than the current

[41] https://www.aluminalimited.com/wp-content/uploads/2023/04/ASX-announcement-2023-20-Alcoa-1Q-2023-COMBINED_FINAL-1.pdf
[42] https://www.gfgalliance.com/about-us/aluminium/
[43] https://www.csiro.au/en/work-with-us/services/consultancy-strategic-advice-services/csiro-futures/energy-and-resources/critical-energy-minerals-roadmap
[44] https://www.resources.qld.gov.au/__data/assets/pdf_file/0005/1726430/critical-minerals-strategy.pdf
[45] https://www.pm.gov.au/media/address-sydney-energy-forum
[46] https://www.iea.org/reports/critical-minerals-policy-tracker/ensuring-supply-reliability-and-resiliency
[47] https://www.canada.ca/content/dam/nrcan-rncan/site/critical-minerals/Critical-minerals-strategyDec09.pdf

range of lists would be advantageous during strategic planning. For example, the USGS and Department of Energy[48] both publish lists, but these are cross referenced.

5. What should trigger an update to the list? For example, global strategic, technological, economic or policy changes.

Mineral criticality is not stagnant; therefore, the Council supports both routine reviews of the critical minerals as well as those that governments may trigger in response to policy changes. However, the Council believes the resources industry should also be able to request a review of the inclusion of a given mineral or metal, providing supporting evidence for this review to take place.

Conclusion

While bauxite, alumina and aluminium have long been recognised in the past as being essential to the national economy, national security and modern technologies; Australia's status as a major global producer has hidden the supply chain vulnerabilities, which have been building for the last two decades, but which have been increasingly exposed since February 2022.

The Council believes that Australia's aluminium value chain (bauxite, alumina and aluminium), as well as HPA, should be considered as Critical Minerals in order to capitalise on its wealth of resources and make Australia a supplier of choice, underpinning both domestic and regional security in the transition to net zero.

Without mining, the world cannot reach net zero by 2050, and the minerals required to achieve our decarbonisation goals are of such magnitude that to reach net zero, we will need more mining, not less. Australia should be a supplier of choice to our partners, allies and emerging markets like the United States, the United Kingdom, Japan, Korea, India and the European Union. Recognising bauxite, alumina and aluminium as critical minerals is one of the keys to the long term success of Australia and our allies clean energy manufacturing industries. While Australia cannot outspend the US IRA, Australia brings its natural resources of bauxite resources – value added in the form of alumina and aluminium - to the partnership.

The Council would be happy to provide additional information on any issues raised in this submission.

Kind regards,

Marghanita Johnson
Chief Executive Officer
Australian Aluminium Council
M +61 (0)466 224 636
marghanita.johnson@aluminium.org.au

[48] https://www.energy.gov/cmm/what-are-critical-materials-and-critical-minerals