



Australia China Business Council
澳大利亚中国工商业委员会

Australia - China Relations
Institute
澳中关系研究院



CRITICAL FACTS, CRITICAL MINERALS AND CHINA: What Australians need to know

Critical insight 1:

Understanding vulnerabilities and leverage in critical minerals supply chains

Critical facts, critical minerals and China: What Australians need to know

CRITICAL INSIGHT 1.

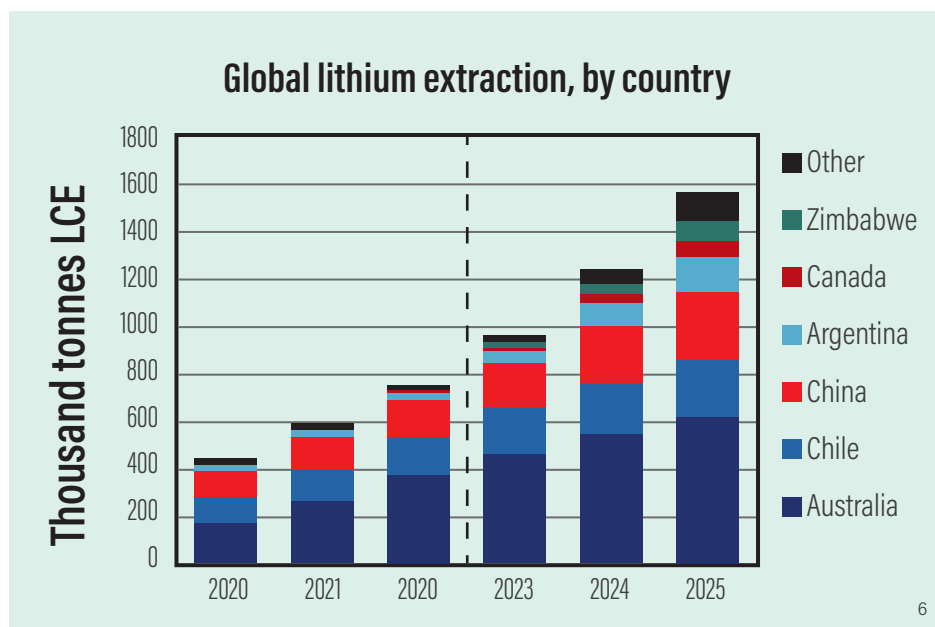
Understanding vulnerabilities and leverage in critical minerals supply chains

When it comes to critical minerals supply chains, a concentration of activity in China – mining, minerals processing and related downstream manufacturing – means that in the Australian discussion Beijing is often presented as holding all the cards. But China, too, has vulnerabilities, and attempts to disrupt parts of the supply chain to further geopolitical objectives can easily backfire. Rather than feeding a spiral of insecurity, Australia and China can pursue a more constructive path.

China's position in critical minerals supply chains is particularly strong downstream in minerals processing and the manufacturing of clean energy goods, like electric vehicles. For example, China produces 90% of the world's lithium hydroxide,¹ a critical ingredient in batteries, and hosts 75% of global battery cell manufacturing capacity.² But upstream, China is dependent on imports to meet three-quarters of its lithium demand. Around 60% of these imports come from Australia.³

Moreover, China's lithium demand is forecast to jump by 0.9 million metric tonnes between now and 2030 – triple that of the U.S., and more than total global demand in 2022.⁴ Australia is the world's largest producer of unprocessed lithium, currently accounting for around half of total global output.⁵

Australia is the world's largest producer of unprocessed lithium, currently accounting for around half of total global output



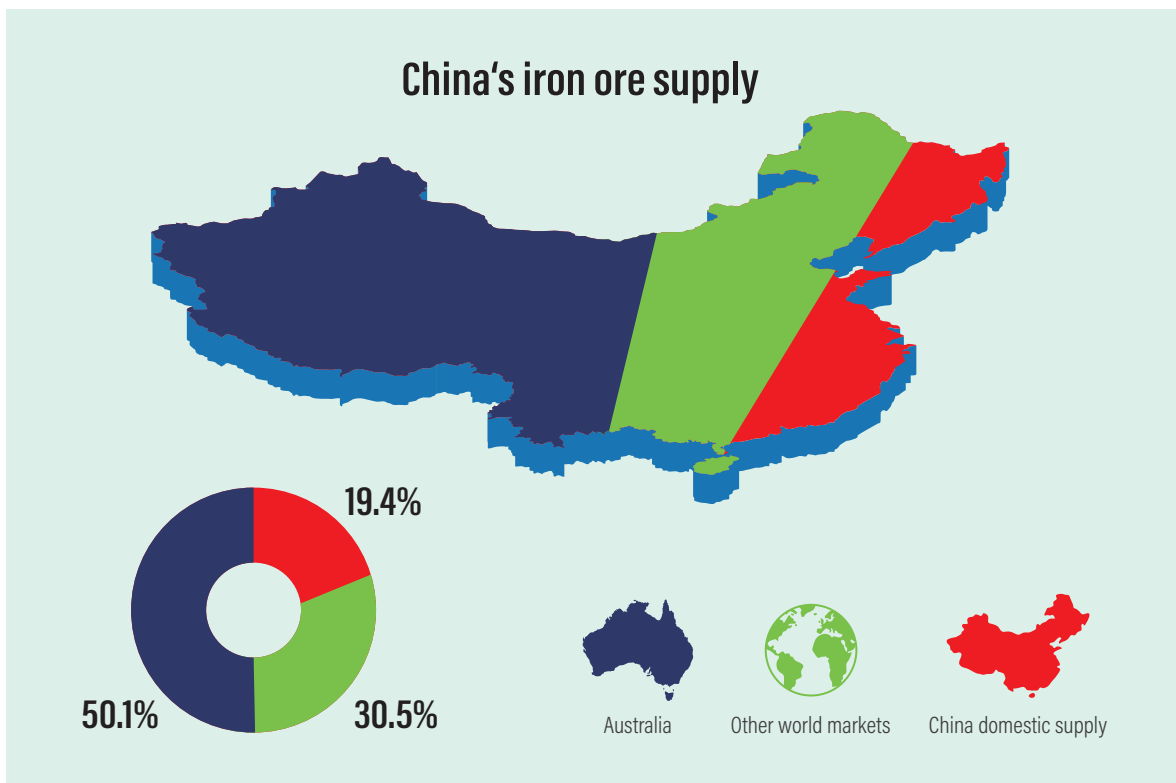
1. Australian Government – Australian Trade and Investment Commission, 2018, 'The lithium-ion battery value chain', <<https://www.austrade.gov.au/ArticleDocuments/5572/Lithium-Ion%20Battery%20Value%20Chain%20report.pdf.aspx?Embed=Y>>.
2. BloombergNEF, 2022, 'China's battery supply chain tops BNEF ranking for third consecutive time, with Canada a close second', <<https://about.bnef.com/blog/chinas-battery-supply-chain-tops-bnef-ranking-for-third-consecutive-time-with-canada-a-close-second/>>.
3. Authors' estimates based on publicly available data sources, including U.S. Geological Survey, China Nonferrous Metals Industry Association, General Administration of Customs of the People's Republic of China and company annual reports.
4. McKinsey & Company, 2023, 'Australia's potential in the lithium market', June 9, <<https://www.mckinsey.com/industries/metals-and-mining/our-insights/australias-potential-in-the-lithium-market>>.
5. Australian Government – Geoscience Australia, 2023, Australia's identified mineral resources 2022, <<https://ecat.ga.gov.au/geonetwork/srv/eng/catalog.search#/metadata/147673>>.
6. Australian Government Department of Industry, Science and Resources, <<https://www.industry.gov.au/sites/default/files/2023-07/resources-and-energy-quarterly-june-2023.pdf>> (p.146).

China has not “locked up” Australian lithium supply by investing in extraction facilities.⁷ Australia’s largest lithium mine, Greenbushes, supplies 22% of the global market for unprocessed lithium. This mine is owned by Talison Lithium, an Australia-China-U.S. joint venture (JV), with the American mining giant, Albermarle holding 49%, and an IGO – Tianqi JV holding 51%. IGO is an Australian Stock Exchange (ASX)-listed company, and Tianqi Lithium is publicly listed on the Shenzhen and Hong Kong stock exchanges. All of Greenbushes’ output is sold under offtake contracts proportionate to these shareholdings. Australia’s second largest mine, Pilgangoora, is owned by Pilbara Minerals, another ASX-listed company. Pilbara Minerals has a diversified share registry that includes Chinese investors, like China’s Ganfeng Lithium Group, but also other prominent investors like Australian Super Pty Ltd, as well as U.S.-headquartered The Vanguard Group and Korea-headquartered Posco Holdings. Pilgangoora’s principal offtake partner is China’s Yibin Tianyi Lithium Industry Co. Ltd.⁸ The third largest Australian mine is Wodgina, a JV featuring U.S.’s Albermarle with a 60% share, and the remaining 40% owned by the ASX-listed Mineral Resources Ltd. Albermarle is the exclusive marketer of Wodgina’s output.⁹ In other words, while more than 90% of Australia’s unprocessed lithium exports are sold to China,¹⁰ that’s not because Chinese ownership stakes in Australian mines are dictating it, but rather because China is where the demand is coming from.

Beyond critical minerals like lithium, since the mid-2000s China has become “utterly dependent on world markets to keep supplying it with all the resources it needs for its economic survival.”¹¹ Australia is a vital supplier to China of not only unprocessed lithium but iron ore, liquefied natural gas (LNG) and more. In the case of iron ore China’s domestic production only accounted for 19.4% of its total demand in 2021.¹² The balance was imported. That same year, 62.2% of China’s iron ore imports came from Australia.¹³

90% of Australia's unprocessed lithium exports go to China as that is where there is market demand. It's not because Chinese ownership in Australian mines dictates it so.

China relies on world markets to supply it with the resources it needs, as is the case with iron ore



7. Zhang, M. 2023, 'Iran's lithium lode: A potential strategic game-changer', The Interpreter, August 9, <<https://www.lowyinstitute.org/the-interpreter/iran-s-lithium-lode-potential-strategic-game-changer>>.
 8. Pilbara Minerals, 2020, 'Additional offtake in place at Pilgangoora – ASX / Media Announcement', March 25, <<https://announcements.asx.com.au/asxpdf/20200325/pdf/44gcmsrvrdw50.pdf>>.
 9. Parker, T. 2022, 'MRL increases Wodgina stake in lithium JV expansion', Australian Resources & Investment, February 9, <<https://www.australianresourcesandinvestment.com.au/2022/02/09/mrl-increases-wodgina-stake-in-lithium-jv-expansion/>>.
 10. Australian Bureau of Statistics, 2022, 'Insights into Australian exports of lithium', August 4, <<https://www.abs.gov.au/articles/insights-australian-exports-lithium>>.
 11. Raby, G. 2018, 'Prometheus bound: How China's power is constrained', Australian Financial Review, September 12, <<https://www.afr.com/policy/foreign-affairs/prometheus-bound-how-chinas-power-is-constrained-20180912-h159py>>.
 12. World Steel Association, 2023, 'World Steel in Figures 2023', <<https://worldsteel.org/steel-topics/statistics/world-steel-in-figures-2023/>>.
 13. General Administration of Customs of the People's Republic of China, <<http://english.customs.gov.cn/>>.

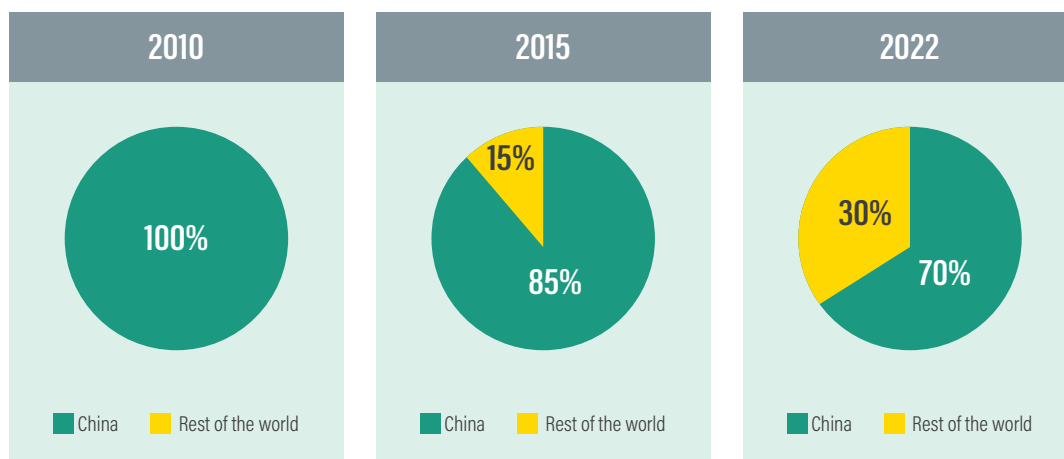
China's exposure to global supply chains extends well beyond those of minerals and fuels. Beijing's fears around supply chain vulnerabilities proved well-founded in October 2022 when Washington enacted a package of trade controls designed to cut off China's access to advanced semiconductors – a move that Australia's Trade Minister, Don Farrell, described as "draconian".¹⁴

In some critical mineral supply chains, China has greater upstream prominence. For example, last year the country accounted for 70% of global rare earths mine production.¹⁵ But the beginning of China's rise to prominence in the industry¹⁶ owed in large part to Western capitals wanting out due to perceived environment costs.¹⁷ And any attempt by Beijing to use this concentration as geopolitical leverage now would be high risk for China's own interests. Rare earths are not, in fact, rare. In 2010, China accounted for almost 100% of global rare earth mining production.¹⁸ That year Tokyo judged that Beijing threatened to disrupt this supply chain, although the extent to which any threat materialised is disputed.¹⁹ Irrespective, in only a couple of years Japan managed to reduce its exposure to China to 50 percent, including by investing in rare earth mining and processing facilities outside of China.²⁰

In 2012, the U.S. also launched a dispute case at the World Trade Organization (WTO) challenging China's use of export duties and quotas on rare earths. What has not been widely reported is that when the WTO found in favour of the U.S., Beijing responded by bringing its practices into compliance.²¹ In more recent years, elevated geopolitical risk assessments have again incentivised greater production outside of China. Australia has quickly emerged as the world's fourth largest producer of rare earths, accounting for 8% of the global total.²² New rare earths processing facilities are also under construction in Kalgoorlie²³ and Onslow²⁴ in Western Australia, as well as other locations like California²⁵ and Texas.²⁶ Further undercutting the leverage that might appear to flow from a concentration of activity in China is that while processed rare earths are vital in some supply chains, they generally exist as solids at natural temperatures and the volumes demanded are relatively small. This makes insuring against supply chain disruption through straightforward measures like stock-piling less costly.²⁷

Rare earths are not, in fact, rare and one could argue that any supply chain dominance is due to China identifying and initiating processing of rare earths early

Contrary to common belief, China's share of global rare earth mine production is in decline



14. Ison, S. 2022, 'Don Farrell's pitch for fair trading', The Australian, November 14, <<https://www.theaustralian.com.au/nation/politics/don-farrells-pitch-for-fair-trading/news-story/96ada11b72a25e13b71a71e69de07da7>>.

15. U.S. Department of the Interior, 2023, U.S. Geological Survey: Mineral Commodity Summaries 2023, <<https://pubs.usgs.gov/periodicals/mcs2023/mcs2023.pdf>>.

16. Zhang, M. 2023, 'Will China seek to exploit its rare-earth dominance?', The National Interest, November 26, <<https://nationalinterest.org/feature/will-china-seek-exploit-its-rare-earth-dominance-205944>>.

17. Klinger, J. 2021, 'Julie Klinger on China's rare earths frontier', Sinica Podcast, February 25, <<https://thechinaproject.com/podcast/julie-klinger-on-chinas-rare-earth-frontier/>>.

18. U.S. Department of the Interior, 2011, U.S. Geological Survey: Minerals Commodity Summaries 2011, <<https://d9-wret.s3.us-west-2.amazonaws.com/assets/palladium/production/mineral-pubs/mcs/mcs2001.pdf>>.

19. Johnston, A. 2013, 'How new and assertive is China's new assertiveness', International Security, 37(4), 7-48.

20. Armstrong, S. Westland, T. 2022, 'The lessons of the economic war on Russia', East Asia Forum, March 20, <<https://www.eastasiaforum.org/2022/03/20/the-lessons-of-the-economic-war-on-russia/>>.

21. Zhou, W. 2021, China's implementation of the rulings of the World Trade Organization, United Kingdom, Bloomsbury Publishing.

22. Australian Government – Geoscience Australia, 2022, Australia's identified minerals resources 2022, <<https://ecat.ga.gov.au/geonetwork/srv/eng/catalog.search#/metadata/147673>>.

23. Monck, C. 2023, 'Kalgoorlie-Boulder rare earths plant enters final stage of construction', The West Australian, April 24, <<https://www.kalminer.com.au/news/kalgoorlie-miner/kalgoorlie-boulder-rare-earths-plant-enters-final-stage-of-construction-c-10412011>>.

24. King, M. 2023, 'Media release - Support for WA rare earths project to boost jobs and commitment to net zero', January 17, <<https://www.minister.industry.gov.au/ministers/king/media-releases/support-wa-rare-earths-project-boost-jobs-and-commitment-net-zero>>.

25. Yu, F. 2023, 'The U.S.-China rare earths battle', Nikkei Asia, July 5, <<https://asia.nikkei.com/Spotlight/The-Big-Story/The-U.S.-China-rare-earths-battle>>.

26. Mining Technology, 2022, 'Lynas selected to build heavy rare earths separation facility in US', June 14, <<https://www.mining-technology.com/news/lynas-heavy-rare-earths-us/>>.

27. Wolf, A. 2022, 'Stockpiling of Critical Metals as a Risk Management Strategy for Importing Countries', Journal of Resilient Economies, 2(2), 28-40.

In yet other critical minerals supply chains where China has upstream supply chain prominence, like graphite ($\approx 65\%$ of global production), Australia is not a material player with just a 2% share of global Economic Demonstrated Resources.²⁸ Accordingly, Canberra has limited capacity to deliver a significant boost to the upstream resilience of the graphite supply chain even if it wished to do so.²⁹ At the end of the day, it needs to be acknowledged that global mineral resources distribution is pre-determined by geography.

The above facts make clear that fears supply chains for critical minerals (and beyond) may fail are felt in both Beijing and Canberra. This provides the basis on which the two capitals might elaborate on their concerns through dialogue and then take steps to reassure the other and preserve mutual benefits.

It has long been recognised that Australia's national interest was best served by Canberra reassuring Beijing that local producers were stable and reliable long-term suppliers of raw materials to Chinese buyers. In addition to making commercial sense, welcoming Chinese, along with other foreign investors, to partner with local producers in project development added to that reassurance. This is the story of the iron ore trade starting in the 1980s and the LNG trade in the 2000s.³⁰ Any shifts away from this proven model in the case of critical minerals now need to be weighed carefully.



*At the end of the day,
it needs to be acknowledged
that global mineral resources
distribution is pre-determined
by geography.*

28. Australian Government – Geoscience Australia, 2022, Australia's identified minerals resources 2022, <<https://ecat.ga.gov.au/geonetwork/srv/eng/catalog.search#/metadata/147673>>.

29. England, C. 2023, 'Renascor Resources says its battery-focused graphite project in SA has robust economics', The Australian, August 8, <<https://www.theaustralian.com.au/business/mining-energy/renascor-resources-says-its-battery-focused-graphite-project-in-sa-has-robust-economics/news-story/94d505d0a3471a406578adaa086cd163>>.

30. Sydney Morning Herald, 2002, '\$25 billion deal a coup for Australia', August 9, <<https://www.theage.com.au/national/25-billion-deal-a-coup-for-australia-20020809-gduh8t.html>>.

ABOUT THE AUTHORS:

James Laurenceson is an economist and Director of the Australia-China Relations Institute at the University of Technology Sydney (UTS:ACRI). His research and commentary have been published in leading academic journals and major media outlets, including the *Australian Journal of International Affairs* and *Australian Financial Review*.



Marina Zhang is an associate professor at the Australia-China Relations Institute at the University of Technology Sydney (UTS:ACRI). Marina held positions at UNSW and Tsinghua University before UTS. She is the author of three books, including *“Demystifying China’s Innovation Machine: Chaotic Order,”* co-authored with Mark Dodgson and David Gann (Oxford University Press, 2022). Alongside her academic publications in technology and innovation, Marina also writes analytical pieces on the intersection of technology and international relations, covering industries such as semiconductors, critical minerals and cyber order.



ABOUT CRITICAL FACTS, CRITICAL MINERALS AND CHINA: What Australians need to know

As the Australian Federal Government implements its critical minerals strategy, the ACBC together with the UTS:ACRI have embarked on releasing “Critical facts, critical minerals and China: What Australians need to know” - a series of thought leadership analysis pieces around China’s historical and potential future involvement in Australia’s critical minerals and rare earths sectors.

Aside from China being a major market, it is not well known that whether it be through foreign investment, labour up-skilling or technology transfer, Chinese companies have played a crucial role in Australia’s emergence in the critical minerals and rare earths sector. With China’s booming green economy, the demand for such resources and interest in partnering with Australia is likely to continue and to increase. However, there have been questions raised in the Australian national debate as to whether Chinese interests are welcome in the sector. This series of analysis pieces explores and unpacks some of the history and facts that are required to have a wholistic understanding of what an ongoing presence or lack thereof of Chinese involvement in the sector is likely to mean for Australia. The views and opinions expressed are those of the authors and do not necessarily reflect the official policy or views of the ACBC. UTS:ACRI also does not take an institutional position on any issue.



Australia China Business Council
澳大利亚中国工商业委员会

Australia-China Relations
Institute
澳中关系研究院



ACBC CONTACT DETAILS

national@acbc.com.au

International Chamber House

Level 5, 121 Exhibition Street Melbourne VIC 3000

UTS:ACRI CONTACT DETAILS

+61 2 9514 8953

acri@uts.edu.au

UTS City campus

Level 18 Tower Building, 15 Broadway Ultimo NSW 2007

Critical minerals, critical insights and China: What Australians need to know