



Submission to:

Australia's Critical Minerals Strategy:
Discussion Paper

3 February 2023

The Advanced Materials and Battery Council's submission to the Australia's Critical Minerals Strategy Discussion Paper

The Advanced Materials and Battery Council (AMBC) has recently been established to support companies to develop multiple battery chemistry value chains to meet global demand for energy storage in the global transition to net zero emissions. This requires a focus on facilitating the extraction of critical minerals and processing the minerals to the requisite purity for battery precursor materials. This submission provides feedback from the AMBC to Australia's Critical Minerals Strategy Discussion Paper.

A. *Creating economic opportunity*

1. **How can Australia capitalise on its existing advantages to create economic opportunity for all Australians - particularly regional communities and First Nations Peoples?**

Australia's critical minerals deposits are often located near regional communities, and in more remote locations near First Nations' communities. Mining and processing should be encouraged to be conducted in situ, so that employment opportunities are made available to those communities closest to the deposits. Infrastructure investments can be targeted to make smaller towns and regional centres more attractive for 'near mine' processing, creating the majority of processing jobs close to existing communities. This would help create Local Investment Local Opportunities (LILo) projects rather than Fly in Fly Out (FIFO) operations. Furthermore, royalty relief based on local employment of unskilled, skilled and upskilled persons could be used as a mechanism for encouraging employment within the region.

Establishing operations in regional, rural or remote areas however brings challenges. Resolution of these challenges needs to be articulated in a clear and transparent way. Communities and Traditional Owners must be consulted from an early stage of the project life cycle to ensure they not only have a say in the developments in their region but are taken along for the journey. Consultation needs to include clearly articulated benefits of development and assistance from local service providers to demonstrate good faith by prioritising local services and attention to assisting with high quality employment opportunities. On-going community engagement is vital to the success of any project and this includes support for training and development for workers and creating business opportunities for First Nations people.



2. What could be done to facilitate project development and ensure benefits flow to regional communities?

The Queensland Government's announcement to establish the Critical Minerals Processing Plant in Townsville is evidence that the Queensland Government is serious about assistance to the sector. However, encouraging investment in critical minerals processing projects requires more than a common user demonstration facility. There is also an urgent requirement for investment in road infrastructure to facilitate access to mines for miners and employees, investment to secure water supply for extraction and processing, facilitating renewable energy investment for supply to mines and rural communities, and investment in industrial precincts for industry development.

Mining and agricultural co-investment should be encouraged from the start of mine project planning, seeking opportunities for common infrastructure to leverage new enterprises in both sectors. For instance many state government regulations restrict the use of mine water in agriculture, due to reasonable concerns about effects of brines and highly mineralised water on the environment. However, this should not be a blanket ban and where mining projects can provide water at a quality that local agricultural enterprises are prepared to accept, these regulatory barriers should be removed.

3. What might be done to ensure maximum reasonable opportunity for local employment and local business participation in projects?

See answer to Q1 above.

4. What role can Government play to help ensure the sector maximises gender equality?

There is a shortage of adequate skilled resources for extraction and processing of critical minerals, and an even greater shortage of adequately skilled female resources. Government can facilitate training and skill development in regional universities and Tafes close to critical minerals deposits with targets for female enrolment, certification and graduation. Our members are supportive of gender equality, but there has to be gender equality of available adequately trained human resources.

B. Developing new sovereign capabilities and industries

5. What are the specific opportunities Australia should seek to realise while developing downstream processing and manufacturing capabilities?

Assistance for project development as mentioned in the answer to Q1, should be prioritised to larger deposits so that multi-user equipment can be deployed for crushing, grinding and processing to support multiple projects and reduce capital outlay for project proponents. The Federal Government's Australian critical minerals list currently excludes nickel and copper which are minerals as important as lithium for the global clean energy transition. This should be rectified.



Also, downstream processing should extend beyond lithium carbonate & hydroxide to elemental lithium metal refining and lithium foil production, and for stationary energy storage, greater attention should be given to Flow Battery chemistries. Flow batteries are particularly well suited to support Australia's shift to electricity supplied from renewable energy. Australia will require up to 90GWh of storage capacity to support the energy transition, up from 1GWh of storage in the system today. Vanadium Redox Flow Batteries (VRFB) and Zinc Bromine Flow Batteries (ZBFB) are very well suited to longer duration energy storage system and grid support because apart from the tanks and control systems, they do not require more expensive and less plentiful metals like cobalt, nickel and lithium. The relatively easy manufacturing process for production of electrolyte and flow batteries will fast-track the development of new sovereign capabilities within a battery industry ecosystem. Flow batteries are recyclable (for VRFBs, over 90% of the system may be recycled) and will contribute to the development of Australia's circular economy.

A further benefit for Vanadium projects is that Vanadium is also most widely used in the steel alloy industry, has an important role to play in aviation, aerospace, automotive and defence applications and will feature prominently in the low emissions steel technologies of the future.

6. For key technologies and value chains, such as batteries, magnets, alloys and other clean energy technologies, what are the key obstacles to Australia moving up the value chain?

Key obstacles to moving up the value chain include a lack of ready-for-business industry precincts, too little access to common equipment for testing and manufacturing, and insufficient experienced engineering skills and technical know how which can slow down investment decisions. What is required is support for domestic market opportunities by focussing on local content. Downstream market signals driven by the governments to use local content will provide pipeline security to organisations looking to move up the value chain. Low pricing of overseas supply is currently a hurdle that can be cleared once local supply chains are developed at competitive scale.

7. How can governments, industry, and researchers support Australia's critical minerals industry to move further downstream and develop new sovereign capabilities?

Critical minerals projects are primarily junior miners without access to networks necessary to secure adequate support from researchers, governments and investors. Governments should seek to resource and support organisations (like the AMBC) to secure tighter integration between governments, industry and researchers.



8. What can Australia do to better develop and retain IP and to attract IP investment from like-minded partners?

Australia should provide greater tangible support for companies seeking to develop and commercialise Intellectual Property. Greater support from government will in turn encourage investment from private sources as well as other governments.

Battery minerals require customised refining and processing stages traditionally developed and deployed overseas. Expensive and time-consuming pilot work is required to build and test these processes. Australian governments can help support pilot projects to develop new techniques. Equally, providing greater R&D incentives for extraction to maximise yield, and critical minerals process development, are key to developing Australian Intellectual Property. Another option would be to enhance the applicability of R&D tax offsets and increase the % of return for novel processes developed in Australia.

The cost of preparing, lodging and securing patents should be eligible under the R&D Tax Rebate arrangements after the grant of the patent at least in Australia, and subsequently the costs of extending registration overseas should also be eligible. It is somewhat perverse that the costs of eligible R&D can be claimed but not the costs of protecting the resulting Intellectual Property.

C. Building reliable, competitive and diverse supply chains

9. How can government support the capability of critical minerals companies and other relevant entities to identify, engage and grow new target markets?

The European Commission, the United States Government, Japan and Korea have all indicated a wish to diversify energy storage supply chains. Preferential trade agreements between Australia and these governments for critical mineral ores and their refined value-added products, will provide greater access to global markets, which will provide significant support to critical minerals companies. Selling Australia as a refined materials supplier rather than a just a supplier of raw ores will be instrumental in the development of the Made in Australia brand.

Visibility to international customers could be achieved through international marketing campaigns, initiated by government and supported by industry groups, to promote Australian critical minerals projects globally as a low-risk, high ethical and sustainable value critical mineral supplier of choice. The production of the Critical Minerals Prospectus is also an important asset in international outreach by the Government promoting Australian projects. For smaller explorers/project developers the costs of attending international trade missions are often prohibitive. A scheme to support qualifying juniors (ie minimum JORC Measured resource of a critical mineral or similar measure of project viability) to rebate costs of attending international trade missions would accelerate engagement with and exposure to international investors and customers.



10. **How should Australia engage with international partners to support the diversification of supply chains? What should this engagement focus on (including which countries)?**

See answer to Q9

11. **What actions can Australia take to ensure it leverages related investment by other countries, for example the US Inflation Reduction Act.**

See answer to Q9

12. **Is there more the Australian Government can do to facilitate business-to-business engagement and drive supply chains diversification?**

See answer to Q9

13. **How can Government and business work together to ensure private sector insights on the context and complexity of current supply chains and markets can inform policy design?**

The Advanced Materials and Battery Council has been established for exactly this purpose. However because the sector is small and with limited resources, it is difficult to fund adequate resources to carry out the activities required to be effective. Industry growth centres have been supported in Australia for other sectors like energy resources and advanced manufacturing but there is no equivalent support for the AMBC to facilitate government and business working together to inform policy design.

Significant support has been provided for the deployment of electricity generation from renewable sources through ARENA, CEFC and NAIF. Similar levels of support for energy storage would deliver similar benefits.

Government should also resource and direct its foreign trade agencies and market intelligence gathering networks to proactively collect market data and map target market supply chains and supplier concerns, delivering informed and qualified data to Australian industry group participants, as happens in our trading partners industry and government alliances.

D. Supporting clean energy technologies

14. **What are the opportunities for critical minerals projects to maximise their ability to support clean energy supply chains and technologies?**

There is significant opportunity in Australia to supply energy storage for firming of electricity from renewable energy sources. As an example the Queensland Government's Energy and Jobs Plan has allocated \$500 million investment in energy storage, this could be supplied from batteries produced from all local content.



15. How could the Australian Government help industry address capability barriers to supporting clean energy supply chains for critical minerals projects?

The Australian Government should increase funding to Australian universities to facilitate support for commercialisation and the development of education programs to increase skills and knowledge customised to the sector's needs.

16. How can the Australian Government support the sector's integration with key clean energy supply chains, both domestic and international?

Domestic integration can be supported by governments' energy contracts including local content targets for identified critical mineral products. Support for Australian producers to lead the world with digital transparency for sustainability and compliance for mining and manufacturing activities will assist with integration in international supply chains including particularly a focus on verified emissions intensity of product at the point of export. Even where emissions intensity of certain minerals or secondary processed material is relatively high, the value of having the data at all will, for a period, immediately preference Australian product to those supply chains where emissions reporting and border tax adjustments are expected to be in place in this decade.

E. Supporting sustainable critical minerals development

17. What more can Australia do to ensure we are the international best practise jurisdiction for ESG?

Australia can secure an international reputation for international best practise by continuing to invest in research and teaching to ensure that extraction and metallurgy lead international best practise. Also, engaging in ESG programs such as Social Suite will assist organisations to report and monitor ESG and Everledger can follow through to prove provenance of products, to ensure compliance with world's best practise.

Ongoing investment in Geoscience Australia can facilitate the network of State Geological Survey offices applying new methods and tools to pre-competitive field work, resources assessment and mapping. Mapping and analysis of the extensive mine dump and mineral process waste dumps seeking 're-mining' opportunities should be a priority. While re-mining will very rarely be of the scale of a new major deposit brought to production, in aggregate critical minerals that were discarded into the dumps of 19th and 20th century mining precincts are likely to be meaningful in terms of total Australian reserves of those minerals - for instance Cobalt in nickel mine dumps.

18. What role can Government play in supporting the critical minerals sector ensure workplaces are safe and inclusive, and can attract and retain underrepresented cohorts, such as women?

See answer to Q4



19. How can Government and industry create meaningful engagement with First Nations Peoples and ensure critical minerals projects benefit their communities?

Starting points for ensuring engagement could involve a simple test that project developers have an effective policy of engagement with the relevant Registered Native Title Corporation (RNTC) where one exists with native title to the project area. Engagement with the RNTC should have the intention of assessing the capacity of members and beneficiaries of the RNTC to participate with the project in any position the project is seeking to fill. In most instances where RNTC's do exist there will have already been engagement between the parties to conduct heritage clearances of areas likely to be impacted during exploration and in mine development and operation. One common area of engagement is to ensure that project developers have at the very least an active indigenous cultural heritage interpretation program for all employees on the project site so that the workforce understands the cultural context of the landscape and the indigenous landholders' practices for caring for country. Opportunities for RNTC members or beneficiaries to work around mining projects is enhanced when a common understanding of the indigenous appreciation of the landscape is widespread in the workforce. As a minimum Government, industry and stakeholders should be creating Reconciliation Action Plans (RAP), in consultation with First Nations Economic Participation organisations.

20. What are the opportunities to further strengthen the ESG credentials of the sector? For example, helping industry showcase their high ESG projects or support enabling capabilities such as the adoption of mineral traceability measures.

Companies' awareness and engagement with climate and environmental issues is increasing rapidly. S&P cite 80 percent of the world's largest companies are reporting exposure to physical or market transition risks associated with climate change, and a similar share are engaging in reducing corporate emissions.

The importance of verifiable and trusted ESG credentials and claims has also come under scrutiny at the World Economic Forum meeting at Davos where some companies have made false claims, or the tools they were using (Carbon Credits) were proved to be ineffective.

Given Australia's high standards of governance and environmental standing there is an opportunity for the sector to show strengthened and verified credentials where possible. Tools such as blockchain or distributed ledger technology can complement attested-to claims with shared evidence and proof that battery minerals value chain participants meet high Australian standards. The same opportunity exists for mineral traceability in following batches of materials as they move through a supply chain. The importance of this has been made clear by the emerging jurisdictional requirements of the European Union (Carbon Border Adjustment Mechanism, Battery Passport), and USA (Inflation Reduction Act).



21. What are the opportunities for Australia in increasing recycling and circular economy practices in the critical minerals sector?

Growing Australia's circular economy needs to start with the following policy principles for advanced materials and batteries:

- back design and manufacture that addresses the full life-cycle of the battery including easy removal of minerals during recycling and opportunities for second-life or repurposing of batteries;
- encourage reporting of materials and possible negative impacts from the recycling process, in particular the potential for chemical reactions resulting in fire and safety concerns;
- ensure product provenance through independent assessment stewardship schemes.

Australia's advantage from domestic critical minerals deposits can be expanded to include the extraction of minerals from existing batteries or from mine tailings, which if processed close to site in combination with virgin minerals, will save time, money and energy. In addition, there are broad scale opportunities for Australia to reconsider how its minerals are "sold" - and instead leased, in order to control the tenure of finite minerals and rare earths. e.g. If sold to a car company, a valuable and rare asset will remain the property of the car company in perpetuity - rather than leased to the car company for ten years and re processed in Australia.

Conclusion

The AMBC is very pleased that the Department of Industry is consulting on the development of Australia's Critical Minerals Strategy. We thank Minister King for providing us with the opportunity to provide our feedback. If the Department of Industry has any further questions or detail, we are happy to be contacted either through the AMBC website (ambc.au) or to the members listed below.

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