



Submission

Australia's transition to a green
energy superpower

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Joint Standing Committee on Trade and Investment Growth
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Dear Committee

The Advanced Materials and Battery Council's submission to the inquiry into Australia's transition to a green energy superpower

Energy storage is the lynchpin of a global transition to net zero emissions and offers the opportunity for Australia to develop a manufacturing industry to underpin its green energy superpower status. The Advanced Materials and Battery Council (AMBC) has recently been established to support and guide the advanced materials and battery sector to become the primary manufacturing sector for re-shoring manufacturing in Australia. This submission discusses the AMBC views on the trade and investment activities required to build this exciting new opportunity for Australia.

1) The positive effect of trade and investment activities

Australia is a large country with a small population and enviable mineral resources. These mineral resources have encouraged very large investment in mining from both domestic and international investors. Indeed, foreign investment from Japan has played a fundamental role in developing Queensland's coal mining industry in the wake of the 1970s oil crises. The establishment and growth of new economic sectors is therefore a product of the investment directed towards companies seeking to capitalise on emerging global trends.

Once again, miners for critical minerals are engaging with international companies in search of early-stage investment. Vanadium miners, in particular, have engaged with international mining operators and investors to facilitate downstream manufacturing activities. These activities provide ongoing job opportunities for Australians and the potential to build businesses secured by domestic and export customers.



Australia's Redflow, a global flow battery company, already successfully deploys MWhs of energy storage projects, of various scales, across Australia and around the world, with success in the US (one of the largest markets globally), including delivering a 2 MWh/500 kW battery in December 2021. Cultivating opportunities like this could be further enhanced through trade agreements.

2) Emerging trends

The global target of net zero emissions by 2050 requires unprecedented investment in metals and manufacturing for global decarbonisation. According to the International Energy Agency, mines will need to reach production considerably quicker than the recent average of 16.5 years, metal ore production, processing, manufacturing of batteries for transportation and stabilisation of electricity supply from wind and solar, all need to grow by around 30% per annum to meet these targets. Australian governments need to streamline their approvals processes, significantly reduce time to plan, invest and deliver infrastructure for projects that seek to participate in this transformation to a zero- carbon global economy.

Australia is also host to companies that are not reliant on critical minerals for battery manufacturing. The trend towards larger, and longer, duration energy storage requirements for the electricity network are driving retailers, utilities, and generators to critically assess technology options. Government can assist businesses developing and marketing these technologies and their supply chains by:

- streamlining processes for grant funding applications;
- develop policy mechanisms, like local content targets, for deployment of Australian made batteries; and
- governments' energy procurement strategies should include offtake (energy storage capacity) for projects that are considered to be Australian.

3) Role of Commonwealth agencies

Commonwealth agencies tend to deliver policy from single departments rather than taking a whole of government approach to policy formulation. To facilitate the development of economic sectors in Australia to meet the global energy transition trend, policy formulation and government response need to reflect the full spectrum of challenges and barriers faced by miners, metal processors, chemical manufacturers and integration specialists. These challenges include:

- Slow permitting
- Multiple layers of bureaucracy, across multiple levels of government
- Industrial precincts that remain in the planning process for too long
- Patient investment for projects across the spectrum from early stage to commercialisation
- Common due diligence of project feasibility and risk for investment and grants from multiple national and international sources.

These challenges can only be addressed by Commonwealth agencies taking a whole of government approach to support projects and new companies to reach commercialisation in time to meet global demand.



4) Commonwealth Special Investment Vehicles

The Clean Energy Finance Corporation and the Northern Australia Infrastructure Facility are both uniquely placed to accelerate local mining and manufacturing of battery materials in Australia. Investment in energy technologies that are solely or mainly Australian based apply to all AMBC members and the geographic locations of many fit within the Northern Australia region. Providing finance options for emerging technologies in energy storage, as well as energy storage projects using mainly Australian based products, will greatly improve Australia's ability to become a green energy superpower. Investment in these areas will also have real and measurable benefits to local communities, creating new industries, mining precincts and manufacturing hubs.

Despite Special Investment Vehicles like CEFC and NAIF financing critical minerals mining, processing, electro-chemical and cell manufacturing projects is complex and time-consuming, especially from within the risk-averse Australian investment community. Helping the multiple battery chemistry ecosystems to grow in Australia requires a bespoke Special Investment Vehicle to streamline investment decisions for projects and companies from extraction to manufacturing that are on the critical path for successful local battery supply chain development.

In particular, Australia's advanced materials and battery sector is in need of a combined special purpose academic/industry/government battery manufacturing institute where new battery technologies can be scaled in a safe not for profit "creche" environment and tested in real world conditions. The AMBC would support this initiative through its charitable status and academic, industry and government members and supporters. The role of this special purpose institute would be to support otherwise costly next stage semi-automatic manufacturing of battery cells - with semi-automatic coating, slitting, assembling and testing in real time industry type environment - with support from universities and governments. Key personnel could be seconded from universities from around Australia - providing real time industry experience for students, researchers and technicians.

5) How to capitalise on trade agreements

Although Australian technologies are often world leading and have initiated in Australia but then been commercialised elsewhere. As an example, vanadium flow battery technology was invented in Australia, but commercialisation has flourished in Japan, Korea and India. Trade agreements to freely export Australian mined processed vanadium to countries deploying large scale energy storage projects, will improve mining and processing project viability. Reverse arrangements should seek to facilitate key technology that has been commercialised elsewhere to be easily acquired for the development of Australian manufacturing supply chains.

Australia needs to build a battery manufacturing ecosystem where the cathode/anode foil, separator, electrolyte, plastics moulding, power electronics assemblies and auxiliary equipment



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such as fans and pump are manufactured and supplied to Australian battery manufacturing requirements and standards. Currently Australia has little supply chain manufacturing capacity. These are essential for local battery cell manufacturers to develop into a national battery manufacturing ecosystem that can supply Australian and International required batteries. Enabling the development of a robust local supply chain faster will accelerate local business to scale and attract investment.

As China dominates global manufacturing, companies in Europe and North America wish to build resilience to reliance on a single supplier. Private and government investors are actively seeking opportunities in, and partnerships with, ideologically aligned countries like Australia. Trade agreements should seek to attract investment to Australian companies working in this strategically important sector.

6) Sectors that play to Australia's strengths

The IEA estimates that global demand for energy storage for all requirements will reach US\$450 billion per annum for the next decade. Australia has the mineral wealth, research led solutions, and the potential to play a significant role in this global transition. Energy storage could become the cornerstone of a re-shoring of manufacturing in Australia. To achieve this requires governments at all levels to get behind the companies trying to make a difference in a meaningful way.

There are multiple global markets to supply, and Australia can develop multiple battery-chemistries to supply into market niches. The vast, high-quality vanadium resource in Queensland's North-West Minerals Province with access to established transport routes for domestic and international trade, make it particularly well suited to be a key material for the world's stationary energy storage requirements. Already local Australian companies are building businesses around vanadium, zinc-bromide, nickel and cobalt sulphate, high purity alumina, graphene and battery tech opportunities which is attracting interest from international investors. Using Australia's strengths, this industry sector can employ thousands of people and provide export trade opportunities, but governments need to move fast to avoid losing these companies and opportunities to those more determined to develop national battery supply chains elsewhere.

Conclusion

The AMBC is very pleased that the JSCTIG inquiry is considering this strategic opportunity for Australia. We thank the Committee for providing us with the opportunity to provide our feedback. If the Committee has any further questions or detail, we are happy to be contacted either through the AMBC website (ambc.au) or to the Directors mentioned below.

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