



Submission to:

Australia's National Battery Strategy:
Issues Paper

17 March 2023

The Advanced Materials and Battery Council's submission to National Battery Strategy Issues 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, and the commercialisation of nanotechnologies for the manufacture of batteries, packs and management systems. This submission provides feedback from the AMBC to Australia's National Battery Strategy Issues Paper.

Theme 1: Capitalising on our existing advantages

1.1. What are Australia's existing advantages? How can Australia capitalise on its existing advantages? And how can Australia expand these advantages?

As the Issues Paper details, Australia is the largest producer of metals for lithium-ion batteries (LiB) and LiBs are forecast to be the predominant battery chemistry for passenger electrification for the next 5-10 years. These mineral deposits are found in areas with high solar irradiance, ideal for the generation of electricity from low-cost photovoltaic panels. In addition, Australia has low levels of corruption, no child labour and a well-paid and educated labour force ensuring that any product originating from Australia will meet with environmental, societal and governance (ESG) conditions expected by European and North American investors and consumers. Finally, Australian research funding has built significant research capacity across multiple universities to facilitate domestic commercialisation of home-grown intellectual property.

Capitalising on these endowments requires support from Australian governments because as Figure 2 in the Issues Paper highlights, existing downstream manufacturing and recycling capacity for LiBs has largely been outsourced to China. The shift of global manufacturing capacity to China has been in evidence since China became a member of the World Trade Organisation in 2001. Figure 1 details the major economy trends in manufacturing output and the proportion of GDP allocated to investment since 2001. With the large proportion of China's GDP allocated to capital formation, far larger than any other economy, it has not been an accident that China now dominates global manufacturing activity.



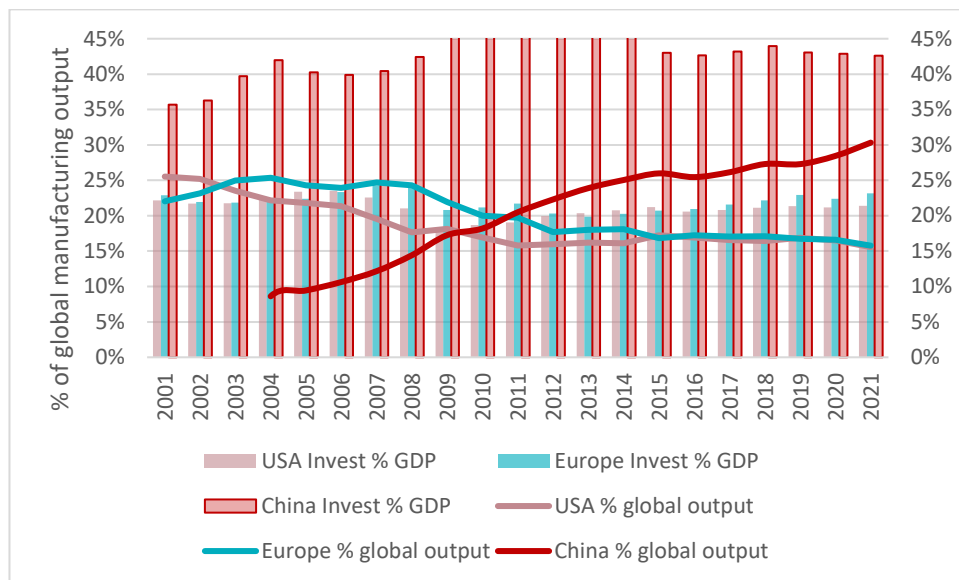


Figure 1: Share of global manufacturing output and investment share of GDP in major economies 2001-21
 Source: [macrorends](#), [International Monetary Fund](#)

This investment has been directed through industry policies geared to develop domestic productive capacity by:

- targeting Foreign Direct Investment (FDI) to Export Processing Zones (EPZ) through tax incentives while extracting concessions from multi-national companies for local sourcing, joint ventures, technology transfers and workforce training. Utilised EPZs to facilitate integration of domestic companies into international markets and applied EPZ earnings to import more advanced technologies;
- promoting infant industries through state ownership, subsidized credit from state-owned banks, public procurement, trade barriers for non-EPZ areas and public investment;
- supporting scale-up by facilitating mergers, identification of national champions, and development of domestic R&D capacity;
- establishing the National Development and Reform Commission (NDRC) to develop industrial programs. In particular, the Program for Science and Technology funded strategic capacity building for sectors identified as important for national security and technological advancement. For detail see [Industrialization and Development](#).

Specific to batteries, transport electrification was identified as a key Science and Technology Industrialisation Project in 1995. Successive Five Year Plans increased support for domestically manufactured LiB's and electric vehicles (EVs) which has resulted in annual sales of EVs in China increasing from 1500 in 2010 to 2.9 million in 2022. China's success is embedded in the recognition that the development of an EV industry was reliant on the development of a robust battery manufacturing sector as a way to compete against more advanced internal combustion engine vehicle manufacturers and thus carve out economic development from the emergence of a new market.



The United States Inflation Reduction Act recognises the importance of government support to secure industry and economic development and seeks to encourage investment in critical minerals extraction and battery manufacturing in the US. In addition, the US is seeking to secure access to critical minerals through a pact with Japan, the UK and others. In response, the President of the European Commission has stated that a European response will seek to secure, fast track and simplify permitting, enable state aid until a European Sovereignty Fund is available, and build transatlantic value chains through trade agreements with Canada, UK, Mexico, NZ and Australia.

The geopolitical shifts underway to secure access to critical minerals and support for commercialisation of battery technologies is evidence of the strategic nature of the potential benefits from supplying advanced materials and batteries for local and international needs. Failure to support commercialisation of domestic processing and manufacturing for battery supply chains will gift the benefits from Australian research and mineral wealth to China, Japan, South Korea, Europe, Canada and the United States. It is also likely to eliminate any chance of a just transition for Australian workers and families dependent on the production and supply of fossil fuels which will decline as the world transitions to net zero emissions. Australian governments should counteract the effects of the incentives offered by the European Commission and the Inflation Reduction Act, to avoid a flight of battery technology intellectual property to the northern hemisphere.

1.2. What areas of the global battery supply chain should Australia focus on, and where are the potential barriers and vulnerabilities for Australian industries in the global supply chain?

Australia's critical minerals and battery-tech strengths lie across multiple battery chemistries from the availability of mineral deposits to world-class technology that could be commercialised in Australia for local use and exported to international consumers. There is significant investment in the northern hemisphere in LiB cell, pack and management manufacturing destined for the auto industry, which could present a challenge for Australian supply to the northern hemisphere.

However, in the other parts of the LiB value chain and all other battery chemistries, Australia has significant competitive advantage due to mineral deposits, renewable energy and stable governance and society. Due to the nature of the different chemistries and global investment the following could be considered as a rule of thumb for level of support:

- Flow batteries (FB):
 - Vanadium FBs are based on Australian research. Australia has significant deposits of vanadium in Queensland and Western Australia. Deposits are found in remote areas with little infrastructure like roads, water and energy. VFBs are fully recyclable, safe, suitable for hot climatic conditions and grid-scale installations. Support for this battery chemistry should be as follows:
 - Development of roads, assistance with access to water and energy near deposits
 - Multiuser processing for multiple projects around Julia Creek in Queensland
 - Procurement policies to facilitate domestic off-take agreement initially for small installations as proof of being able to meet performance requirements



- Incentives to write-off capital purchases for pilot and early-stage production
 - Assistance with access to North American and European markets through preferential trade agreements
- Redflow's Zinc-Bromide FBs are based on Australian research, manufactured in Thailand, and re-imported to Australia for deployment. These batteries are mature, safe, fully recyclable, suitable for hot climatic conditions and grid-scale installations, requiring inexpensive and widely available materials. Support for this battery chemistry should be in the form of procurement incentives and incentives to support investment to re-establish manufacturing operations in Australia.
- Advanced materials:
 - High Purity Alumina (HPA) is required for LiBs and the LED lighting sector. It is sourced from different ores and processed to the requisite purity level through a variety of hydro-metallurgical processes. Support for HPA should be as follows:
 - Access to commercial advanced materials characterisation testing facilities to accelerate commercialisation
 - Access to warehouse facilities with adequate electrification for processing and permitted for chemical manufacturing
 - Incentives to write-off capital purchases for pilot and early-stage production
 - Assistance with access to North American and European markets through preferential trade agreements
 - Lithium and nickel and cobalt sulfate are required for nickel-rich LiB cathode chemistries. There is already significant global demand for lithium, nickel and cobalt. Support for these metals should be as follows:
 - Provision of roads, assistance with access to water and energy near deposits, processing and manufacturing centres
 - Access to commercial advanced materials characterisation testing facilities to accelerate commercialisation
 - Incentives to write-off capital purchases for pilot and early-stage processing
 - Assistance with access to North American and European markets through preferential trade agreements
 - LiB electrodes include cathodes and anodes. Support for electrode manufacturers should be as follows:
 - Access to commercial advanced materials characterisation testing facilities to accelerate commercialisation
 - Access to warehouse facilities with adequate electrification for processing and permitted for chemical manufacturing
 - Incentives to write-off capital purchases for pilot and early-stage production
 - Assistance with access to North American and European markets through preferential trade agreements
- Battery cells:
 - LiB cells are currently manufactured in China, North America, South Korea and Europe. Investment in manufacturing capacity in these countries is very high. No



company in Australia manufactures LiB cells yet, although many import cells from China which are added to local battery packs and battery management systems. There are plans to manufacture cells in Australia. Support for cell manufacturers should be as follows:

- Access to commercial advanced materials characterisation testing facilities to accelerate commercialisation
 - Access to warehouse facilities with adequate electrification for processing and permitted for chemical manufacturing
 - Incentives to write-off capital purchases for pilot and early-stage production
 - Procurement policies to facilitate domestic off-take agreement initially for small installations as proof of ability to meet performance requirements
 - Assistance with access to North American and European markets through preferential trade agreements
- Battery packs and management systems:
 - All batteries need packs and management systems. Most cells are imported into Australia with packs and management systems, although there are companies in Australia that manufacture the packs and management systems locally. Support for local battery pack and management systems manufacturers should be as follows:
 - Procurement policies to facilitate domestic off-take agreement initially for small installations as proof of ability to meet performance requirements;
 - Development of capacity to locally certify to Australian standards; and
 - Assistance with access to North American and European markets through preferential trade agreements
- Battery recycling:
 - As electrification of transport and firming of renewable energy increases, batteries will need to be recycled to harvest valuable metals contained in the cell for reuse and to avoid dumping in landfill. Support for recyclers should be as follows:
 - Access to warehouse facilities with adequate electrification for processing and permitted for chemical manufacturing;
 - Incentives to write-off capital purchases for pilot and early-stage production;
 - Procurement policies to facilitate domestic off-take agreements.

1.3. How should government, industry, and researchers support Australia's battery industries to grow and compete?

Successful sector development requires tightly integrated support for industry from government and the research community.

Requirements from governments:

- Policy. Governments need to develop policy quickly to respond to the dynamic global environment and ensure that policy can be adapted fast to secure desired outcomes. To be able to do this, governments need to provide a mechanism for engaging with industry to



identify requirements. Currently, because the sector is comprised of small start-ups, company executives find it difficult to ensure that they are heard or can inform policy.

- Industrial precincts. In other jurisdictions, available industrial precincts are a part of the attractive suite of incentives offered to companies seeking to commercialise locally. It is essential that governments prioritise the fast development of appropriate precincts for industry to occupy as they commercialise and grow.
- Infrastructure. Many battery mineral deposits are located far from existing infrastructure. The cost of roads, water and energy increase project funding requirements, increase investor risk perception and consequently reduce investor appetite. Commitment to expediting infrastructure urgently will increase investment.
- Training and education. A battery manufacturing ecosystem will require trained technicians and skilled graduates. The development of suitable apprentice, training, certification and higher education programs should be designed in conjunction with industry requirements.

Requirements from the research community:

- The research community needs to respond quickly to research questions to facilitate commercialisation. Research funding programs can require significant resource to apply for and can be slow to deliver research outcomes. Commercialisation facilitation research programs should be designed to standardise terms to deliver research outcomes quickly.
- Training and education. The development of suitable battery and process engineering programs should be designed in conjunction with government and industry requirements.

Theme 2: Turning our innovative ideas into opportunity

2.1. How should Australia build on its strengths in R&D and innovation to commercialise more battery related research?

See answer to question 1.3 above.

2.2. How could Australia best promote its strengths in R&D to grow domestic battery industries?

See answer to question 1.3 above.

2.3. What steps should governments, or a Growth Centre-like entity, take to support growth of domestic battery industries?

Uneven distribution of benefit from critical minerals opportunity

Future Charge: Building Australia's Battery Industries, Future Battery Industries Co-operative Research Centre (FBICRC)'s report, discusses two paths for a future battery sector in Australia - one that focusses only on extraction of critical minerals and one that seeks to develop onshore materials processing and manufacturing. The second path highlights the additional benefit from processing the energy transition minerals to battery precursor purity and then manufacturing the lithium cells and battery packs. The writers of the FBICRC report assume that Australia will supply



31% of global demand for critical mineral ores, 15.5% of global demand for refined metals, 6.2% of global battery precursor materials and 5% of global lithium cells and battery packs. The report finds that taking the second path to modestly increasing refining and processing of critical minerals onshore will result in an additional \$3.3 bn gross value added to the Australian economy and 16,000 jobs.

Extending the assumptions of the Future Charge report and the IEA's Role of Critical Minerals in Clean Energy Transition report, allows the estimation of value-add potential by state. Figures 2 and 3 summarise the potential value-add by state and by li-ion battery value chain segment based on FBICRC's second path scenario. The series titled 'CritM Proc Lost' is the revenue potential of processing critical minerals onshore instead of letting processing move offshore, as assumed in the Future Charge report. The series titled 'CritM Proc Offshore' is the revenue from the manufacture of lithium cells and battery packs which is more likely to be located close to manufacturing facilities in the northern hemisphere. According to this exercise: WA will benefit from \$21 bn from extracting, refining and processing critical minerals by 2030, and \$46 bn by 2040; SA, NSW and QLD will experience modest benefits from additional copper extraction and refining for EV manufacturing and critical mineral manufacturing for the domestic market.

The projections highlight that there is significant upside value-add potential for Australia from refining and precursor manufacture for distribution to the Northern Hemisphere - \$24 bn by 2030 and \$50bn by 2040.

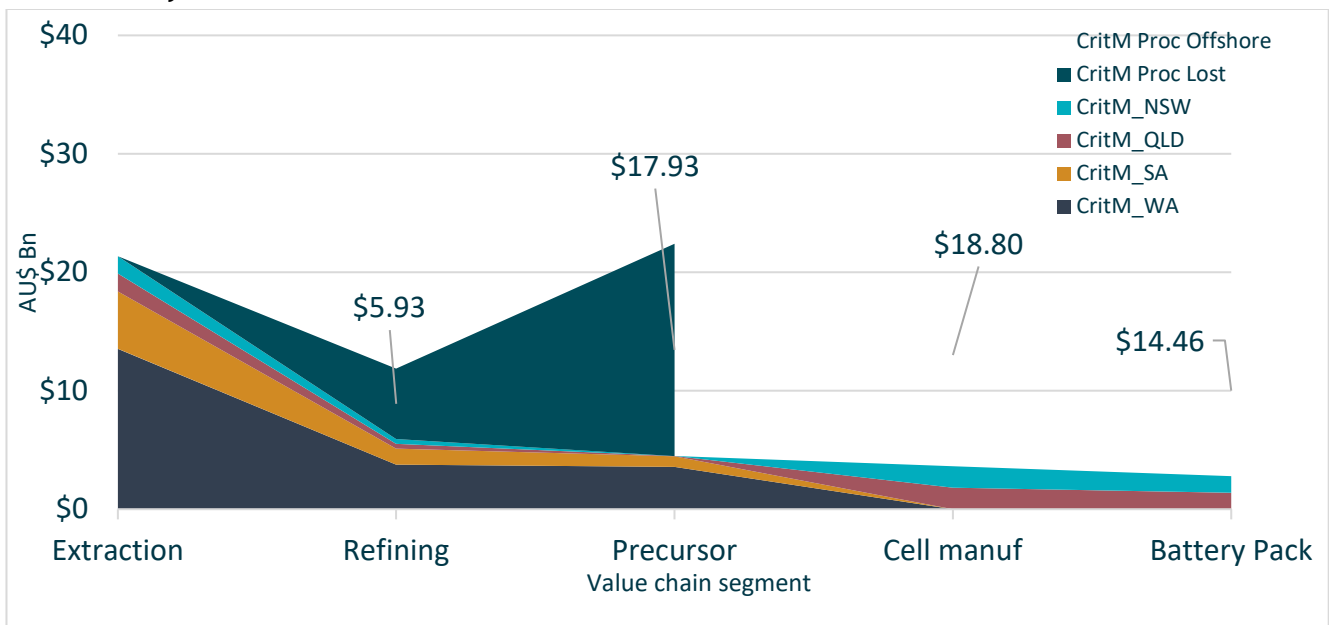


Figure 2: Distribution of value-add by state from critical minerals li-ion battery opportunity, projections to 2030



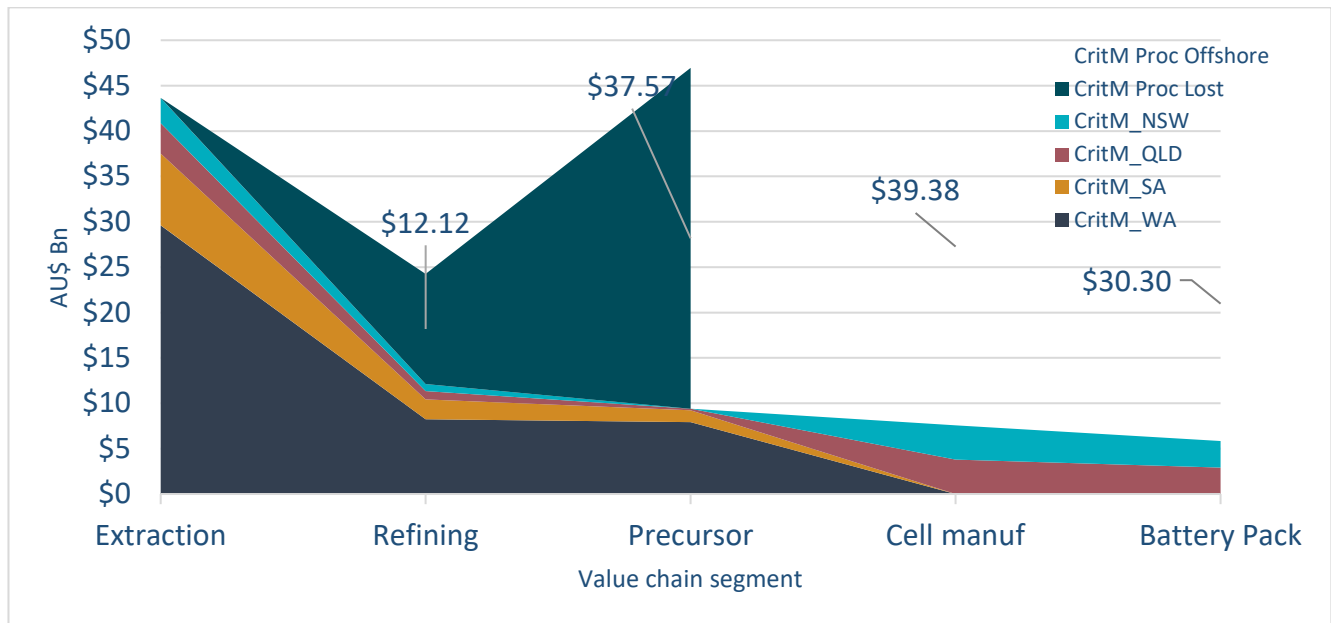


Figure 3: Distribution of value-add by state from critical minerals li-ion battery opportunity, projections to 2040
Sources: FBICRC, Future Charge, 2021; IEA, Role of Critical Minerals in Clean Energy Transitions, 2021; AMBC member assumptions

If the Australian Government seeks to enable all states to benefit from the global transition, significant support for battery-tech start-ups (of which there are many in the Eastern states) and manufacturers to the local battery supply chain (also in the Eastern states) is required for these companies to mature into a globally competitive Australian advanced materials and battery sector.

Steps to support domestic battery industries.

Economic history is replete with the successful development of new sectors in countries like Japan, Taiwan, South Korea, Germany and China. In summary, the development of a new industry requires better access to:

- Finance through:
 - Low-cost loans; and
 - Investors steered to support the sector through a government commitment to a comprehensive industry strategy.
- Research to:
 - Plug gaps in technology; and
 - Improve competitiveness of product.
- Government for:
 - Supportive policy mechanisms;
 - Removed bottlenecks to permitting and establishment, in particular preparedness of industrial precincts;
 - Procurement of locally produced products;
 - Research and commercialisation funding;
 - Testing and piloting infrastructure; and



- Investment incentives including tax and production credits similar to those currently on offer by the US government's Inflation Reduction Act.
- Training and education to:
 - Supply an adequately skilled work-force for a suite of evolving technologies; and
 - Adapt to a dynamically evolving manufacturing requirement including use of robotics and AI.
- International markets to provide access to:
 - Investment from other national governments through preferential trade agreements;
 - Multi-national corporations through national government programs; and
 - Qualified international off-take partners through more powerful bargaining by Australia's federal government in support of this new sector.
- Integrated research-industry-government networks through:
 - Collaborative bodies established to support the development of networks, and enhanced integration between research and industry; and
 - A Growth Centre-like entity, focussed specifically on battery supply chain manufacturing.

Requirements from a Growth Centre-like entity

The Industry Growth Centre Initiative (IGCI) applied \$255 million of public funds to 6 Growth Centres (GC) from 2014-15 to 2021-22. Assessment of the success of the program shows mixed results¹:

- impact against objectives: “has been constrained by their personal networks, staff expertise, and funding. In particular, the GC's lack the resourcing and structures to drive transformational change at a sectoral level”.
- program management and design: “difficult to look across GC activities and easily link all the activities to the IGCI objectives”
- leadership: “ stakeholders outside the GCs and their participants do not accept that the GCs are in a position to play a leadership role across their sector. The GCs have very limited resources and are operating in sectors where there are well-established industry associations, research organisations and even some government agencies”. “The GCs need to engage more productively with industry associations, some research organisations and government agencies to achieve win-win outcomes for both parties.”
- governance: models require “improvement to help drive the longer-term performance and accountability of GCs and improve integration and alignment of the program with the Government's industry, science and technology policy agenda”.

A Growth Centre-like entity for the advanced materials and battery sector therefore needs to be designed to avoid historic shortcomings and meet objectives for deploying public funds to facilitate new sector commercialisation and development.

¹ Acil Allen, 2020, Industry Growth Centres Initiative: Initial Impact Evaluation



Table 1: MMI Funding for recycling, clean energy and critical minerals processing

MMI Funding for recycling, clean energy, resources and critical mineral processing				
Row Labels	Recycling & Clean Energy	Resources/CritMinProc	Grand Total	
NSW	6%	4%	10%	
NT	0%	2%	2%	
QLD	1%	14%	15%	
SA	1%	0%	1%	
TAS	0%	2%	2%	
VIC	6%	0%	6%	
WA	0%	66%	66%	
Grand Total	13%	87%	100%	

Row Labels	Recycling & Clean Energy	Resources/CritMinProc	Grand Total	
NSW	\$18,848,707	\$14,553,601	\$33,402,308	
e-waste biorefinery	\$4,208,800		\$4,208,800	
Hydrogen	\$9,807,972		\$9,807,972	
METS		\$10,000,000	\$10,000,000	
Underground mining Evs		\$4,553,601	\$4,553,601	
Wool waste for packaging	\$4,831,935		\$4,831,935	
NT		\$6,000,000	\$6,000,000	
Lithium hydroxide plant		\$6,000,000	\$6,000,000	
QLD	\$3,503,622	\$46,205,087	\$49,708,709	
Manufacture power management systems	\$3,503,622		\$3,503,622	
Vanadium processing		\$1,205,087	\$1,205,087	
Alumina production		\$45,000,000	\$45,000,000	
SA	\$2,200,000		\$2,200,000	
Silicon thermal battery	\$2,200,000		\$2,200,000	
TAS		\$5,168,560	\$5,168,560	
Underground mining Evs		\$5,168,560	\$5,168,560	
VIC	\$20,000,000		\$20,000,000	
Recycling for packaging	\$20,000,000		\$20,000,000	
WA		\$222,294,535	\$222,294,535	
Rare earth refining		\$44,844,464	\$44,844,464	
Recycle lithium refinery residues		\$4,901,488	\$4,901,488	
Redox flow batteries		\$3,948,583	\$3,948,583	
Vanadium processing		\$49,000,000	\$49,000,000	
Cathode precursor manufacturing		\$119,600,000	\$119,600,000	
Grand Total	\$44,552,329	\$294,221,783	\$338,774,112	

- Expectations of Growth Centre-like entity
 - Equitable assistance across states.

As shown in Figures 2 and 3, critical mineral resources are predominantly located in Western Australia, but there are significant critical mineral deposits and advanced precursor materials and cell manufacturing projects in the other states. Grant allocations from the Modern Manufacturing Initiative were disproportionately



directed to Critical Minerals in Western Australia, as detailed in Table 1. To enjoy a national benefit from the global energy transition, assistance needs to be equally distributed across all Australian states.

- Governance
 - Knowledge of sector. It is essential that the Board, the Executive and Management of the GC have the requisite knowledge and expertise to guide and operate the Centre. It is incumbent on the Centre to source personnel from all Australian states, with expertise in all battery chemistries, across all value chain segments. Experience in extractive resource projects should not be the proxy for experience in advanced materials and battery manufacturing. If requisite skills are not available or unevenly distributed across Australia, Board members and personnel should, at the expense of the Centre, be required to gain experience from short placements in appropriate institutions in the Northern Hemisphere.
 - Allocation of resources. Projects and funding should be allocated by an advisory board with representation from all battery chemistries, all segments of the value chains, all states and all sizes of companies in the sector.
 - Transparency. Decision criteria for project support, details and summary of funding allocated and operational costs should be publicly available.
 - The GC model should be informed by advanced materials and battery manufacturing stakeholders' requirements for commercialisation success.
- Sectoral support
 - Successful sector development requires tight collaboration between industry, research and government. Industry and research institutions have already established the AMBC as an association to facilitate collaboration to fast-track commercialisation. The GC should support this organically grown industry and research organisation to be a powerful advocate and support the growth of the advanced materials and battery ecosystem.
 - Funding bodies like the NRF, CEFC, NAIF have a broad scope and mission. The GC advisory board should be consulted on investment and financing decisions made by the national funding bodies to ensure informed decisions.
- Mission
 - The GC needs to be focussed on batteries not all forms of renewable energy.
 - The National Battery Strategy Issues Paper references a Growth Centre-like entity called the Powering Australia Industry Growth Centre (PAIGC) to support Australian battery industries. The initial discussion about the PAIGC stated that its purpose is “to provide advanced technology and skills development to businesses looking to locally manufacture renewable energy technologies.” Renewable energy deployment has already benefitted from more than a decade of support from the Australian Renewable Energy Agency (ARENA) and the Clean Energy Finance Corporation (CEFC). Seeking to build a locally manufactured renewable energy sector is a very ambitious goal. To



compete with mature global suppliers of solar panels and wind turbines, would require unprecedented support for local manufacturers of solar panels and wind-turbines to attempt to be competitive in mature global supply chains.

- By comparison, battery-tech start-ups are seeking to compete in immature supply chains, with fast evolving technologies, and take advantage of a very large increase in global demand for energy storage. AMBC members are concerned that if government support for the manufacturing of batteries in Australia is coupled with support for the manufacturing of renewable energy technologies, support for battery manufacturing will be diluted by the level of support required for domestic manufacturing of mature renewable energy products that are produced at scale elsewhere. To facilitate the manufacturing of batteries in Australia, a separate GC needs to be focussed on battery manufacturing rather than a wide objective to support everything from hydrogen to carbon capture and sequestration, wind turbines, solar panels, hydrogen fuel cells and a variety of components for multiple battery cell chemistries.

Theme 3: Encouraging investment to grow our battery industries

3.1. What are the barriers to investing in Australia's battery industries, and how can they be mitigated? How can governments encourage more investment?

Battery-tech is new, dynamic, evolving fast, with complex supply chain requirements. These factors all contribute to a perception of relatively high risk by private investors. The risk may be elevated for private investors, but this can be mitigated by government's visible support for the sector to reduce risk for private investors. The benefit for governments is the development of a new manufacturing sector, globally competitive, providing secure employment for the coming generations of workers but also to provide opportunities for a just-transition for workers in existing industries whose employment will become vulnerable to a global energy transition. Australian governments should seek to find ways to reduce the risk by pursuing support as summarised in the answer to question 2.3.

3.2. What areas could Australian-made batteries have a competitive advantage for use in Australia and for export?

- Research. Research conducted in Australian universities is globally recognised as being world-class. For too long, Australian governments have done too little to retain the benefits of Australian intellectual property in Australia. Commercialisation is a challenging process and for success, government support for the industry needs to be directed to support commercialisation that industry requires rather than using set-and-forget, untargeted macro-economic conditions. The US Inflation Reduction Act's (IRA) level of support for renewable and battery technologies is evidence of the benefit that the US seeks to secure from a domestic robust manufacturing sector. The Australian Government needs to design



policy to reflect the existence of the IRA, and to counteract against the potential for intellectual property leakage to North America.

- Mineral deposits. Australia has significant deposits of the requisite battery minerals. It is more expensive to transport ores to the northern hemisphere than it is to transport battery materials at every segment of the value chain. It will be economically beneficial to process and manufacture battery components in Australia.
- Renewable energy. Australia has exceptional renewable energy resources, which will lead to the lowest cost energy supply around the world. This will facilitate reduced cost manufacturing of battery components and batteries in Australia.
- Skilled workforce. Although Australia has a shortage of appropriately skilled battery-tech technicians, scientists and engineers, existing Australian workers are well skilled in machine operation, primary metal manufacturing, and chemical engineering and manufacturing for the development of the industry.
- Renewable energy targets for many Australian states. Ambitious renewable energy deployment targets in Queensland, New South Wales and Victoria, will drive demand for energy storage. AMBC members will seek to meet local demand for batteries but it does require that government and government owned corporations have strategies for ensuring that batteries or battery components are increasingly locally sourced.

3.3. What functions or forms of help should the Powering Australia Industry Growth Centre deliver to support Australian battery industries?

- Facilitating delegations to Europe and North America to secure investment and off-take;
- Education and workforce development;
- National and international standards definition and local certification to Australian standards;
- Facilitate the establishment of investment funds for the sector;
- Funding research to facilitate commercialisation and supply chain development; and
- Aligning industry interests and opportunities with indigenous communities and ensuring protection of cultural and natural heritage.

3.4. How can the additional advantages of a precinct model and collaborative vertical integration be achieved for our battery industries?

The precinct model brings with it significant benefits if the precinct has been designed and is available to supply energy, water, and permitting as required rather than being the responsibility of a small organisation without the ability to bargain with property developers and utilities. This will reduce time and the cost involved in both pilot and early-stage commercialisation plans.

Commitment to precincts will facilitate visibility of Australia's support for the sector for investors, future customers, supply chain partners, trade partners, skilled workers and researchers. Collaborative vertical integration also reduces the time and cost involved in pilot and early-stage commercialisation. Precincts need to be developed in the requisite time to be of use to the



industry. AMBC members' plans tend towards commercial operation before mid-2025 which would require precincts to be designed, developed and completed urgently.

Theme 4: Creating the enabling environment for industry growth

4.1. What can be done to develop the workforce necessary for domestic battery industries?

Developing the necessary workforce requires close integration between the tertiary sector, industry and governments. The AMBC already boasts the University of Queensland and Queensland University of Technology as members, but to deliver the workforce in the time required, governments need to support projects to identify the skills required, develop the programs to advance these skills and then roll them out according to industry-identified timeframes. Members are already experiencing constraints with being able to source adequate skills. Importing skills from other countries is slow and time-consuming. It would be beneficial for the industry if some form of pre-approval is applied to skills required for battery-tech, such that immigration or work visas can be expedited quickly. In addition, government assistance with attracting talent to Australia for employment in both industry and research, would reduce the time taken to resource projects.

4.2. How can Australia best maintain a world leading environmental, social and governance reputation for products?

Australia's international reputation has suffered from disengagement from the global climate policy agenda. To reassert Australia's reputation for world-leading environmental, social and governance credentials, will require remaking its brand through a concentrated focus on and communication of Australia's commitment to renewable energy and manufacturing across the battery-supply chains to support the global net zero emission ambition. A part of this brand rehabilitation could include a commitment to a sector wide sustainability framework, safety standards, testing and certification, and battery material provenance through blockchain technologies like that applied by Everledger.

4.3. What can be done to give confidence that Australian product safety risks are effectively understood, mitigated and managed?

Australian governments will need to demonstrate commitment to safety standards throughout the product life-cycle through requiring investment in testing, certification, traceability and comprehensive reporting.

4.4. How can governments and industry ensure circular economy principles are incorporated into the life cycles of batteries made and used in Australia?

Australia is already home to companies seeking to recycle batteries, both those made in Australia and those imported to Australia. There is no lack of ambition and technology is advancing to be commercialised in time for the fast growth of re-purposing and recycling of batteries. Repurposing and recycling are not cost-less and Australian governments need to prepare for recycling by requiring stewardship of battery life-cycles for all batteries used in Australia. Companies seeking to manufacture in Australia are ready to ensure that battery stewardship is a part of their product plans but governments need to ensure that similar requirements are made of batteries being



imported into Australia through tariffs or recycling bonds or royalties collected on import to fund recycling. There can be no free lunch for imported batteries.

Conclusion

The AMBC members thank Minister Husic for providing the opportunity for feedback to the National Battery Strategy. 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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