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AUSTRALIAN BATTERY RECYCLING INITIATIVE

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Battery recycling – securing innovation in a growth sector critical for the clean energy transition

Attached is the Australian Battery Recycling Initiative's (ABRI) submission to the NSW Government's Industry Development Framework.

Australia's battery recycling industry capability and investment is growing rapidly as batteries are an essential part of the clean energy transition. Consequently, used batteries need to be recycled and the materials recovered. As the CSIRO has identified, the opportunities for lithium-ion battery recycling and reuse of critical minerals are enormous with the industry value projected to be $3.1 billion. Lithium-ion battery recycling in Australia was around 320 tonnes in 2027/18. Analysis, for the Battery Stewardship Council, shows that end of life battery volumes are projected to grow to around 137,000 to 180,000 tonnes by 2036 requiring the need for local solutions to support recovery of critical minerals for input to domestic industries.

The lithium-ion battery recycling opportunities are in addition to an already well established lead acid battery recycling industry, with two recyclers based in NSW, and a growing alkaline battery recycling sector, both of which have a strong circular economy focus.

ABRI's submission acknowledges the early work of the NSW Government in a number of areas to support battery recycling. It highlights the need for funding to support investment in a start-up industry sector and in fire safety research by Fire & Rescue NSW. Coordination across government in a complex network of environment, planning and safety requirements is also critical to supporting industry growth so that regulations can be consistent and streamlined to deliver safe and sustainable battery recycling outcomes.

ABRI is the peak body representing over 50 companies across the battery value chain focusing on a battery circular economy and recycling. The move to a circular economy means that ABRI has expertise across the battery life cycle and for all battery types. ABRI's membership includes battery manufacturers, importers, distributors, retail, used battery collectors, recyclers and mining/mineral processing companies.

For further information, please contact me by email secretariat@batteryrecycling.org.au.

Yours sincerely,

Submitted via email

Katharine Hole
CEO, Australian Battery Recycling Initiative

Questions	Response
1. Describe the top two or three transformative forces that will shape transition challenges and opportunities in your industry over the next 10 years.	• Rapid growth in battery uses across all sectors to support low carbon energy targets, especially in electricity and transport, and increased pressure to improve security of critical minerals is driving the need for increased battery recycling capability. Lithium-ion battery recycling in Australia was around 320 tonnes in 2027/18. Analysis, for the Battery Stewardship Council, shows that end of life battery volumes are projected to grow to around 137,000 to 180,000 tonnes by 2036 requiring the need for local solutions to support recovery of critical minerals for input to domestic industries and deliver national security objectives. • Businesses across the battery value chain are vertically integrating and restructuring as mining, transport and energy companies enter parts of the chain to support clean energy transition and critical minerals recovery. At the same time, new, diverse business models are emerging to support battery stewardship (via B-cycle, Australia's battery stewardship scheme) and vertical integration. This is also driving changing commercial arrangements for the management of energy storage and electric vehicle batteries particularly at end of life. • Increased focus on technology and operational processes to minimise fire and safety risks in the management of end-of-life batteries.
2. What effects do you expect these transformative forces will have on your industry (or on your own business) over the next 10 years?	• Battery recycling and critical minerals recovery becomes a key economic sector as investment and minerals value adding increase. This is underpinned by substantial growth in volumes of recycled batteries. • Greatly improved understanding of technology and techniques to minimise the risks of battery fires and how to manage battery fires when they occur. • Step changes in battery recycling technology as B-cycle driven investment and current business/research sector investments identify efficiency improvements to battery recycling processes and increased recovery of minerals.
3. What action is your industry or business taking, or intending to take, to address the effects of these transformative forces?	Industry, Australian research institutions and businesses are working on a range of projects to: • remove regulatory roadblocks and inconsistencies which are inhibiting growth whilst supporting safe and sustainable outcomes for all; • build understanding of regulatory requirements across industry and support best practice compliance; • reduce red tape (where safe to do so), improving data collection and information sharing;

Questions	Response
	• address regulatory gaps for new technologies and business practices, such as reuse and repurposing of batteries; • improve the efficiency and sustainability of recycling techniques and support a circular economy through increased minerals recovery; and • address knowledge gaps to support fire risk minimisation and improvements to battery recycling technology. There is a strong research capability building across Australia at universities as well as through the CSIRO and Future Battery Industries CRC. This is being complemented by government supported research such as that being led by NSW Fire and Rescue through the SARET (Safety of Alternative and Renewable Energy Technologies) program.
4. Are there critical constraints across the business operating environment (for instance, related to markets, skills, production capacity, technology, finance capital or infrastructure) that affect the capacity of your industry or business to take up opportunities?	Yes. The critical constraints are related to: • Funding challenges as battery recycling volumes are still not commercially sustainable and insurance pressures due to increasing battery fires are driving costs. Changing battery technology and research are expected to improve understanding of fire risk minimization techniques over the longer term but will not address short term challenges. • Soft infrastructure, notably data collection and information sharing through government. For example, ABRI strongly supports the development of the national hazardous waste tracking system and improved collection of data on new and used battery fires through the National Fire Data Reporting Guidelines. • Prescriptive and not outcomes-focused, technology-neutral regulation. Existing regulations unnecessarily restrict innovation or block new product pathways to market. • Inconsistent approaches across planning/environmental/safety regulatory environments and circular economy objectives. ABRI supports consistency and streamlined regulation where safe and sustainable to do so. • Lack of skills in fire and safety risk advisory services for battery management in both industry and government as this is a new and evolving field. Operational skills requirements to support lithium-ion battery recycling have also been identified in the Future Battery Industries CRC *Workforce development plan*.[1]

[1] https://fbicrc.com.au/wp-content/uploads/2021/12/Vocational-skills-gap-assessment-and-workforce-development-plan-VFinal.pdf

Questions	Response
5. Why would your industry be a suitable target for demand or supply side industry policy interventions over the next 10 years? Where in your supply chain would this intervention be most effective, and why? Please be specific and include evidence as to why your industry would not be able to resolve this issue without government action.	Batteries are an essential part of the clean energy transition and recovery of the minerals in those batteries is important for national security and to support the circular economy. NSW has strong expertise in the mining and METS (Mining Equipment, Technology, Services) industries which can be used to support the battery recycling sector. Intervention would be most effective from used battery collection to recycling/minerals recovery as this is the sector with high risks and where there are knowledge gaps. Government intervention is required as the critical constraints identified in Question 4 relate to the industry/government interface and funding. Collaborative engagement with government and industry to progress a safe, transparent and financially effective battery recycling across Australia. The speed and rate at which industry is projected to grow and gaps in knowledge highlight the need for the NSW Government and industry to establish a working group to share learnings and jointly develop solution to emerging issues.
6. What are the key areas in your industry where there are opportunities for NSW Government programs and actions to accelerate ongoing economic growth?	The Circular Solar program could be expanded to have a stronger focus on battery recycling. A number of NSW government initiatives could be used as case studies for examining regulatory roadblocks and data collection gaps for example: • NSW Transport is looking at the practical implementation of the commitment to 100% clean public transport needs and how recycling for used lead acid and lithium batteries will be part of this project including regulatory issues and planning rules. • The NSW Waste and Sustainable Materials Strategy could be used to coordinate an action plan to support safe and sustainable battery recycling while at the same time focusing on outcomes based regulation. It could also consider how government agency battery recycling activities are inhibited by existing frameworks.
7. Considering the transformative forces underpinning economic structural change, such as those described above, what are the benefits to NSW citizens of adequate and well-coordinated industry policies that accelerate this change?	Adequate and well co-ordinated industry policy related to battery recycling will bring the following benefits: • Economic growth and jobs as highlighted by the CSIRO in its report *Australian landscape for lithium-ion battery recycling and reuse in 2020*. Work by PWC for the Future Battery Industries CRC also highlights the role that the battery recycling sector with other services for the battery sector could potentially contribute $600 million in value added and a further 5,600 jobs. PWC notes it will take time for battery recycling to become economically significant because the stock of waste is limited. However, it is important to take steps now to support recycling including reviewing regulatory

Questions	Response
Please provide specific examples, and where possible link them to one or more of the transformative forces.	requirements regarding handling of battery waste, stewardship and working with consumers to encourage battery recycling set up for growth in the battery recycling industry. • Increased value add in minerals processing and secondary industries which support the battery sector, such as fire and safety risk managing advice. • Export income from battery related goods, services and expertise. The NSW Fire & Rescue research program has the opportunity to provide leadership in this area.
8. Where do you think the NSW Government could make the biggest difference to encourage industry innovation and growth?	The two biggest areas are: • Funding to support industry start up and growth until volumes become sustainable • Funding to support research, especially improving understanding of fire safety and risk minimization processes • Collaboration, coordination and partnership with industry to work on matters discussed elsewhere in this submission which touch on the government/industry interface.
9. Are there any risks or costs from intervention that the NSW Government should consider?	Changes to the framework for recycling Collaboration, coordination and partnership with industry to work on matters discussed elsewhere in this submission which touch on the government/industry interface are required to support industry commercial viability. However, these will need to be implemented in a manner which supports sustainability and environmental outcomes, and reduces fire risks.
10. What information would you like to see to demonstrate how progress is being made towards accelerating industry growth through NSW Government programs and actions?	• Demonstration of outcomes focused regulation which supports diverse business models. • Demonstration of greater cross agency collaboration.
11. What are your views on how well the current selection of NSW Government programs and actions enable change at the industry level? For example, are there too many or too few industry programs; are they too small scale to	There is limited focus on battery recycling. The Circular Solar grants program makes a small financial contribution to support investment in battery recycling. Details on how the Critical Minerals and Recycling Precinct at Parkes are still emerging although there is limited understanding of how the regulatory framework will support lithium-ion battery recycling at scale in Parkes due to dangerous goods transport restrictions and other environmental and safety approval processes. Programs are focused on funding and not addressing other issues such as those at the government/industry interface.

Questions	Response
make a difference at the industry-structure level; are the effects likely to be ongoing beyond the life of the program or limited to the program period?	
12. Describe any current programs and actions that have made a notable difference to productivity and competitiveness in your industry?	There are two current programs which have the potential to make a notable difference: • The voluntary national battery stewardship program, B-cycle, which commenced in 2022 and is focused on collection and recycling of consumer batteries and examining other sectors. The program pays a rebate to battery collectors, sorters and recyclers. Data from this program is still at the early stages of collection. Preliminary indications suggest that the rebate contribution to industry costs is supporting increased investment. However, the scheme is highlighting a range of challenges with knowledge and data gaps. • NSW Fire & Rescue's SARET research program is in the startup phase. Learnings from this program have the potential to improve management of fire incidents from new and used battery fires and reduce fire risks.
13. Could any programs be merged to be more effective, or should any be ceased?	• No comment
14. Are there any actions, or examples of effective practice in other jurisdictions (within Australia or overseas) that the NSW Government should consider to better support economic structural change in NSW industries?	• The Victorian government agencies are undertaking a range of projects to improve understanding of tools for safe and sustainable management of waste batteries. This includes: a guideline for storage and management of waste batteries; work on sources of risks for waste fires, including batteries, particularly the interaction with machinery and equipment; policy work on preventing fires from waste lithium-ion batteries; and coordination across agencies. • Green Industries SA has released a report on government actions - *Capitalising on the lithium-ion waste resource challenge in South Australia*. • Queensland is developing a Battery Industry Strategy.
15. How can the NSW Government generate program outcomes that drive growth and value? How	• Battery recycling industry program outcomes should look at targets for investment, industry value add and growth in the services sector supporting battery recycling.

Questions	Response
should the NSW Government work to achieve these outcomes with your industry, private sector and other levels of government?	• Collaboration, coordination and partnership between government, research institutions, industry and other private sector participants to work through the issues/projects discussed elsewhere in this submission which touch on the government/industry interface.