



Submission to:

Draft Queensland e-Products Action
Plan 2023-2033

17 April 2023

The Advanced Materials and Battery Council's submission to The Draft Queensland E-Products Action Plan 2023-2033

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, and the recycling of e-products for reuse across multiple battery chemistries value chains. This submission provides feedback from the AMBC to The Draft Queensland E-Products Action Plan 2023-2033.

The AMBC would like to thank the Queensland Government for starting this discussion about e-Product, and for showing its support for design to reduce waste as well as potential mechanisms to reduce waste already circulating in the community. The recommendations below identify policy mechanisms which would further strengthen the Action Plan.

Ensuring waste is designed out of battery life cycles in Queensland

1. Reducing lithium-ion batteries in landfill

Lithium-ion batteries (LiB) are energy-dense with flammable electrolytes. If LiBs fail thermal runaway results in battery cells bursting and the release of toxic, corrosive, flammable, and explosive vapours and gases, and an intense, self-sustaining fire. Although it is illegal to dispose of LiBs in garbage they still end up there. Brisbane City Council is [reported](#) to have had garbage trucks dump their loads onto the street after catching fire.

According to CSIRO, only 10% of Australia's LiB waste was recycled in 2021, compared with 99% of lead acid battery waste and LiB waste is growing by 20% per year and could exceed 136kt by 2036. The Action Plan reports that e-waste recycling is offered at Officeworks and Harvey Norman, which is a good start, but e-waste recycling should be more widely available to ensure that no LiBs end up in the garbage or in landfill. If the Action Plan identifies more comprehensive mechanisms for collection it will show the public that it the Queensland Government is serious about keeping LiBs out of waste.

The Action Plan also encourages design circularity which is good but it should be backed up with incentives to keep LiBs out of household waste. All LiB's used in Queensland are manufactured



internationally and imported within devices without any requirement for EPR of the LiB. Extended Producer Responsibility (EPR) is a policy approach that requires battery producers/sellers to take responsibility for the lifecycle of their products, including end-of-life management. EPR programs incentivize producers to design batteries that are easier to recycle or reuse, and to establish collection and recycling programs to ensure that batteries are managed in an environmentally sound manner.

Recommendation 1: Queensland's E-Product Action Plan needs to include a planned requirement for EPR for all LiBs sold in Queensland with Policy and Regulatory Reforms to reflect the plan to introduce EPR.

Recommendation 2: Tax incentives can also be used to encourage manufacturers and importers to market more sustainable and resource-efficient products. For example, tax incentives could be offered to resellers of products with an EPR, a longer lifespan, or that are manufactured from recycled materials.

Recommendation 3: Public procurement policies could be implemented to create a market demand for products with LiBs that have EPRs.

Recommendation 4: Education and awareness campaigns can be used to inform consumers and businesses about the importance of LiB circularity and encourage more sustainable purchasing choices for electronic products.

Recommendation 5: Facilitate the establishment of a battery recycling (LiB and other battery chemistries) in Queensland to avoid transportation costs of spent batteries to current facilities in VIC and proposed facilities in NSW which will act as a deterrent to recycling batteries in Queensland.

2. Transport electrification will intensify the need for repurposing regulation and policy

Electrification of passenger vehicles is projected to increase significantly over the next decades with vehicles likely to be electrified with LiBs for at least the next decade. Each EV LiB is expected to last approximately 10 years. By that stage while the EV LiBs may be unsuitable to power a car, they should still have approximately 70% capacity, making them suitable for repurposing to other applications before the end of their full operational life. However, repurposing will require intervention by way of disassembling EV battery packs, determining their cells' health, replacing the most degraded cells, and reassembling them with specific control and safety equipment for their second-life application.

Second-life applications for EV LiBs can be:

- direct reuse, in which LiBs collected from insurance write-offs and inspected and tested to be usable are resold as replacements in other EVs;
- repurpose LiBs to replace traditional grid-connected generators for peak-shaving and to deploy them as storage for utility renewable energy which could provide a further 10 year life for the LiB;
- Be repackaged for residential application to time-shift rooftop solar energy.



There are however barriers to second-life applications for EV LiBs including:

- no clear requirement for EV sellers in Queensland to be responsible for second-life or recycling of EV LiBs;
- no incentives for EV owners and a lack of guidance for what they should do with their EV LiB after decommissioning their vehicle;
- no clear indication from EV sellers as to their business plans for repurposing, recycling or ownership of battery materials;
- few LiBs available for reuse;
- ambiguity over who is responsible for initiating or executing the re-purpose process;
- cost of safety measures for repurposers;
- no way of measuring the state and suitability of the LiB to be repurposed;
- EV LiBs are not designed for second-life applications.

There is the potential to facilitate the transition for existing internal combustion engine service stations to battery repurposing centres through a comprehensive policy framework. Funding for the transition could come from EV sellers (let's call it the LiB Repurposing Bond) required to contribute financially to a body tasked with managing the transition including developing business models and retraining mechanics to become electricians and battery technicians.

Recommendation 6: Consider regulation to require EV sellers to detail business plans and responsibility for repurposing and recycling spent LiBs.

Recommendation 7: Develop a policy framework to require EV sellers to contribute to the LiB Repurposing Bond to fund a body tasked with developing business models to transition internal combustion engine service centres into LiB repurposing centres, unless they provide evidence of and accept responsibility for internal management of battery repurposing.

3. LiB's that are no longer suitable for second-life applications will require recycling regulation and policy

When the LiB is no longer able to store energy adequately, recycling will be required to reduce waste and to recover valuable metals from the LiB. Battery recycling has been slow to take off given the low number of available batteries; however, with the predicted EV growth, there will be a continued need for recycling infrastructure, centres and practices, alongside repurposing centres. Currently recycling requires metallurgy either through heat or through chemical leaching to separate out the metals, typically cobalt, nickel, aluminium, iron and lithium.

The challenges to recycling are similar to repurposing LiBs:

- battery packs are unlikely to be designed with easy or safe access to their contents;
- high startup costs;
- chemistries may change making some metals less valuable;



- no evidence from EV manufacturers or sellers as to their business plans for recycling and ownership of battery materials.

Although EV's and LiBs for storage have only recently become popular in Queensland, and the need for recycling likely only to become evident in about a decade, it would be prudent to build the policy framework now as part of the repurposing policy so that expectations of EV sellers and owners are established early in the product life cycle.

Recommendation 8: Develop a policy framework to require EV sellers to contribute to the LiB Repurposing Bond to fund a body tasked with developing business models for the recycling of LiBs across the country, or provide evidence of business plans for recycling.

Conclusion

The AMBC members are supportive of the Draft Queensland E-Products Action Plan 2023-2033 and request that the Action Plan be extended to focus on the requirement for circularity of EV LiB's in particular.

Recommendation 9: Provide greater focus on the requirements for LiB circularity throughout the Action Plan and include specific measures in the Regulation and Policy for LiB repurposing and recycling.

The AMBC members thank Minister Scanlon for providing the opportunity for feedback to the Draft Queensland E-Products Action Plan. If the Department of Environment and Science 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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