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Committee Secretary
Standing Committee on Climate Change, Energy, Environment and Water
Parliament House, Canberra
via email: CCEEW@aph.gov.au

INQUIRY INTO THE TRANSITION TO ELECTRIC VEHICLES

Lithium Australia Limited (ASX:LIT) welcomes the opportunity to contribute to the *Inquiry into the transition to electric vehicles* and assist the committee as it seeks to further understand the challenges and opportunities facing the Government as Australia increases its uptake of electric vehicles (EVs). Our interest is with the systems and infrastructure required to support the transition and how Australia responds to the need to improve battery safety, disposal, and recycling.

About Lithium Australia (ASX:LIT)

LIT is an ASX-listed technology company with a national footprint and over 20 years' expertise spanning the breadth of the battery materials supply chain. We are the essential link between Australia's mining sector and a future local battery manufacturing industry, and the only licensed mixed-battery recycler in Australia.

Through our various technology platforms across the battery value chain, we have a unique perspective on the development of the EV battery value chain and the implications for governments and consumers of the circular economy over time.

LIT is a key technology partner to the electric vehicle industry through our three divisions:

VSPC: Advanced battery materials

With over 20 years' experience, VSPC develops leading-edge cathode materials for next-generation lithium-ion batteries. Our high-quality, high-performance, and globally cost-competitive LFP cathode powder already features in electric vehicle and energy storage applications. Going forward, it will continue to enable safer, cheaper, and more environmentally-friendly transport and energy storage options to come to market as Australia moves towards a zero-carbon economy.

Envirostream: Battery Recycling

Envirostream leads Australia's battery recycling industry, by providing sustainable services for collection, sorting, and processing of end-of-life batteries of all types (including those from electric vehicles), to capture critical metals for re-use. With enterprise-level battery recycling agreements with global corporations, and consumer-level collection partnerships with some of Australia's leading brands; Envirostream provides true circularity to the battery industry.

Lithium Chemicals: Technology and Innovation

Novel and disruptive technologies developed by Lithium Australia will allow greater and more efficient extraction of Australia's lithium deposits from traditionally non-viable low-grade sources and the recovery of lithium from tailings that would otherwise go to waste; The technology, called LieNA[®] is now in Joint Development with Mineral Resources limited – a leading lithium ore miner in Western Australia.

Electrification will necessitate the safe handling of thousands more large-scale batteries

As a present-day recycler of end-of-life EV and energy storage system batteries, LIT uniquely understands the complexities of collecting, making safe, and properly recycling large-format batteries. We are one of just two companies in Australia accredited by the government-backed B-cycle scheme to both sort and recycle used batteries after collection.

The average home storage battery weighs between 50kg and 110kg and requires special transport and storage systems. The batteries in Australia's best-selling EV weigh in excess of 700kg and demand similar safe handling practices.

LIT believes there are significant opportunities for expanding the battery value chain and recycling industries in Australia, particularly for large-format batteries. However, the widescale transition to EVs presents several challenges that require government support and intervention.

Consistent regulation and product stewardship is critical for Australia's transition

There is an urgent need to establish and enforce consistent safety regulations for large-format batteries throughout their lifetime. From manufacture through to end-of-life, batteries must be considered a 'dangerous good' and regulated as such.

Australian jurisdictions must implement a consistent set of regulations covering all stages of batteries, including the manufacture, use, collection, transportation, and end-of-life processing/recycling. This must include requirements on the safe handling and storage, even if that storage is temporary, of large-format batteries.

Regulations must cover all individuals and businesses who may at any time possess large-format batteries, including warehousing of batteries before use. A mandated product stewardship scheme that covers every stage of ownership and details requirements for safe handling and storage would be a useful tool to ensure best practice.

Battery recycling should be mandated and regulated

The disposal of batteries is a key event that must be appropriately regulated. It will also ensure critical minerals are utilised to their fullest extent. The risk of fire to people and the environment caused by damaged batteries and/or thermal runaway is well documented. Through the Environment Ministers Meeting forum, the Australian Government should mandate the recycling of spent batteries and see a nation-wide ban on the disposal of batteries to landfill agreed (such a ban is already in place in the ACT, South Australia, Victoria, and proposed in Western Australia). Banning the disposal of batteries to landfill will not only address a key environmental and safety hazard in the end-of-life stage of batteries; it will also be of significant benefit to the burgeoning domestic battery manufacturing and recycling sectors.

Improved and harmonised dangerous goods regulations for battery storage/handling

Commonwealth leadership is further needed to harmonise dangerous goods regulations and guidelines, with a common approach for lithium-ion batteries. This will ensure a best practise approach in the movement and storage of end-of-life batteries across Australia – reducing environmental and exposure risks, preventing fires, and making doing business in this growing sector easier for Australian companies.

For example, EPA Victoria provides guidelines for the storage and management of waste batteries and recommends collection containers contain no more than 30kg of waste batteries in a single container.

Safety regulations should be strengthened and provide specific guidance concerning batteries that are damaged, especially those that may have been impacted by fire. Batteries impacted by fire can pose a significantly higher risk and present a risk for an extended period of time, compared to normal. Specific requirements should apply to their collection and storage.

Ban export permits for batteries and e-waste

Caution must be taken to avoid an unintentional abdication of Australia's responsibilities. Consideration should be given to the potential for individuals and businesses to offshore the responsibility of safe handling and disposal of batteries, including to countries with poor ESG credentials. Notwithstanding the requirement for a permit from the Department of Climate Change, Energy, the Environment and Water, spent batteries are routinely exported for disposal and/or processing internationally. Australia should not offshore the responsibility of safe handling and disposal of batteries and ought to implement a phased ban on export permits for batteries and e-waste. This would additionally ensure a feedstock of product is available for processing by Australia's growing battery recycling sector and underpin its future viability.

A new safety rating to encourage adoption of safer types of batteries

Lithium iron phosphate (LFP) is considered an intrinsically safer type of lithium-ion battery compared to nickel, manganese, cobalt, and aluminium chemistries, due to its superior thermal stability – which reduces the risk of thermal runaway. In extreme cases, thermal runaway can cause batteries to explode and start fires. In minor cases, it can cause batteries to melt or be damaged beyond repair. This thermal stability derives from the chemical structure of LFP, where oxygen is tightly bound to phosphorous, which hinders the release of oxygen. In the event of thermal run away, the energy release from LFP batteries is the lowest of the battery chemistries and occurs at a lower rate, further reducing the risk.

Another consideration is that the materials used in LFP batteries have a low toxicity, whereas cobalt and nickel as used in other battery types, are carcinogenic. LFP batteries therefore reduce the environmental hazard and exposure risk in the event of a battery fire or incorrect disposal of batteries.

Lithium manganese iron phosphate (LMFP) – an emerging phosphate chemistry alternative to LFP – provides similar safety, thermal stability, and cycle life benefits to LFP batteries; whilst offering increased energy density, approaching that of nickel and cobalt based cathode chemistries.

Promotion of LFP and LMFP lithium-ion batteries would help consumers to select a safer alternative. To assist with this, creation of a safety rating for lithium-ion batteries may provide consumers with the information necessary to make safety-based decisions for applications where alternate types of battery chemistries are available.

Changing role for the automotive industry (vehicle service and repair; dismantlers and recyclers)

As Australia continues to transition towards EVs, more local and independent businesses will be involved with their maintenance and repair. TAFEs and Registered Training Organisations have established an Electric Vehicle Skill Set and a Certificate III in Automotive Electric Vehicle Technology to help build capability within the sector.

However, clear requirements are needed to ensure the safe handling and storage of EV batteries (e.g. in high street repair shops) and prevent stockpiling. All technicians working on EVs should be licensed to ensure they are properly trained in powering and de-powering vehicles, managing toxic fumes, battery recycling procedures, and managing the high risk of fires caused by damaged batteries.

Public hearings

Thank you again for the opportunity to contribute to the *Inquiry into the transition to electric vehicles*. Lithium Australia would be pleased to appear before the Committee's public hearings and/or provide any further clarification, information, or advice as necessary.

Yours sincerely

Simon Linge

CEO

Lithium Australia