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Department of Industry, Science & Resources
National Battery Strategy
By email: batteries@industry.gov.au

24 March 2023

Dear Department,

Submission in response to National Battery Strategy Issues Paper

The Business Council for Sustainable Development Australia (**BCSDAustralia**) welcomes the opportunity to make this submission to the Department.

We would also welcome the opportunity to speak directly on these points at the appropriate time.

Responses to specific questions
Reponses to the specific Questions are detailed below.

Yours faithfully,

Yours faithfully,

Andrew Petersen
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Question	Response
Theme 1: Moving up the value chain	
Q1.1: What are Australia's existing advantages? How can Australia capitalise on its existing advantages? And how can Australia expand these advantages?	Australia has several existing advantages in the battery industry: **Rich mineral resources**: Australia has abundant reserves of lithium, cobalt, nickel, and other key minerals used in battery production. This positions the country as a major player in the battery supply chain. **Renewable energy potential**: Australia has vast potential in solar and wind energy, which can provide clean, low-cost electricity for battery manufacturing, aligning with SDGs 7 (Affordable and Clean Energy) and 13 (Climate Action). **Skilled workforce and strong research sector**: Australia has a highly skilled workforce and a strong research sector, both of which can be leveraged to develop cutting-edge battery technologies and drive innovation. To capitalize and expand on these advantages, the following actions are recommended: **Develop an integrated battery value chain**: Australia should focus on establishing a complete battery ecosystem, from mining and refining to manufacturing and recycling. This would involve fostering partnerships between mining companies, research institutions, and battery manufacturers to ensure a seamless transition across the value chain. **Encourage investment and innovation**: The government, research sector, and industry should work together to create incentives for investment in battery technologies and manufacturing facilities. Support for research and development (R&D) and fostering innovation will be crucial to maintain a competitive edge in the global market. **Leverage global partnerships and knowledge exchange**: Australia can benefit from collaboration with leading global players in the battery industry to gain insights, share best practices, and access new markets. Engaging with organizations like the WBCSD and its member companies can provide valuable perspectives and case studies to inform Australia's battery industry strategy. **Focus on sustainability and circular economy principles**: Aligning battery industry growth with SDGs 9 (Industry, Innovation, and Infrastructure), 11 (Sustainable Cities and Communities), and 12 (Responsible Consumption and Production) will ensure that the sector's development is environmentally sustainable and socially responsible. This includes adopting responsible mining practices, prioritizing energy-efficient manufacturing processes, and implementing recycling and reuse schemes for end-of-life batteries.

Q1.2: 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 should focus on the following areas of the global battery supply chain: **Mineral extraction and processing**: As Australia is rich in lithium, cobalt, and nickel, the country should capitalize on its mineral resources by ensuring efficient and sustainable extraction and processing. This would strengthen its position in the global battery market and contribute to the raw materials supply. **Battery component manufacturing**: Developing local manufacturing capabilities for battery components, such as cathodes, anodes, and electrolytes, will enable Australia to capture more value from its mineral resources and build a more robust domestic industry. **Battery cell and pack manufacturing**: Australia should invest in battery cell and pack manufacturing to meet the increasing demand for energy storage solutions in electric vehicles, grid storage, and consumer electronics. **Recycling and reuse**: Establishing facilities for recycling and repurposing end-of-life batteries will not only reduce waste but also create a secondary source of valuable materials. This aligns with the principles of a circular economy and promotes a more sustainable battery industry. Potential barriers and vulnerabilities for Australian industries in the global supply chain: **Global competition**: Australia faces strong competition from established battery manufacturers in Asia, Europe, and North America. Competing with these players may be challenging, particularly in terms of cost and access to the latest technology. **Access to capital and investment**: Securing sufficient capital to develop and scale battery manufacturing facilities and infrastructure may be a challenge for Australian industries, as investors may perceive higher risks compared to established markets. **Regulatory and policy environment**: The lack of a cohesive regulatory framework and long-term policy support for the battery industry may hinder growth and investment in the sector. **Skilled workforce**: Attracting and retaining a skilled workforce, particularly in specialized areas such as battery engineering and manufacturing, may be a challenge as the industry grows and competes with other sectors for talent.

Q1.3: How should government, industry, and researchers support Australia's battery industries to grow and compete?	**Develop a long-term strategic vision**: South Australia's Home Battery Scheme serves as an example of a government-led initiative to accelerate the adoption of home energy storage systems, creating local jobs and investment in the battery industry. Internationally, Germany's National Electromobility Development Plan outlines a comprehensive strategy for the growth of electric mobility and battery technology. **Establish supportive policies and regulations**: The Australian Renewable Energy Agency (ARENA) has been instrumental in providing funding for renewable energy projects, including battery storage solutions. This support has helped to advance projects like the Hornsdale Power Reserve, the world's largest lithium-ion battery installation. Similarly, the European Union's Battery Alliance initiative promotes strategic investments, innovation, and regulatory support for the European battery industry. **Foster innovation and R&D**: The Commonwealth Scientific and Industrial Research Organisation (CSIRO) has established a Future Science Platform on Advanced Energy Storage Technologies to drive research, development, and collaboration in the battery industry. This initiative aims to develop next-generation battery technologies and create new opportunities for Australian businesses in the global battery market. In the United States, the Joint Center for Energy Storage Research (JCESR) is a public-private partnership focused on advancing battery technology and reducing battery costs. **Encourage collaboration and partnerships**: Australian companies can collaborate with international counterparts to exchange knowledge, expertise, and technology. Tesla's partnership with the South Australian government to build the Hornsdale Power Reserve is an example of such collaboration. Furthermore, initiatives like the Global Battery Alliance, which brings together businesses, governments, and NGOs, can help Australia tap into global expertise and resources to accelerate the growth of its battery industry. **Support skills development and workforce training**: Governments and industries should invest in education and training programs to develop a skilled workforce capable of meeting the demands of the rapidly evolving battery sector. For example, the US Department of Energy's Energy Storage Workforce Innovation Center focuses on workforce development and training for the energy storage industry. **Incentivize local manufacturing and supply chain development**: Australia can learn from the example of the European Battery Innovation project, which supports local battery manufacturing and supply chain development through funding, research, and innovation. The Australian government can establish similar initiatives to promote domestic battery manufacturing and enhance Australia's position in the global battery supply chain. **Promote sustainability and circular economy principles**: Governments and industries should prioritize sustainable and responsible sourcing of raw materials, as well as recycling and reusing batteries to minimize waste and environmental impact. The European Union's Batteries Directive, which promotes the collection, treatment, and recycling of batteries, serves as a model for Australia to develop its own sustainability initiatives in the battery sector.
Theme 2: Turning our innovative ideas into opportunity	

Q2.1: How should Australia build on its strengths in R&D and innovation to commercialise more battery related research?	**Strengthen collaboration between academia, industry, and government**: Encourage partnerships between research institutions, businesses, and government agencies to facilitate knowledge sharing and technology transfer. For example, the US Department of Energy's National Laboratories have been successful in fostering collaboration between researchers and industry partners to drive innovation in energy storage technology. **Establish dedicated funding for battery R&D and commercialization**: Create targeted funding programs and grants to support battery research and the commercialization of innovative technologies. Programs such as the European Union's Horizon 2020 and the US Advanced Research Projects Agency-Energy (ARPA-E) have been successful in financing breakthrough research and development in battery technologies. **Support early-stage start-ups and SMEs**: Provide financial assistance, mentoring, and incubation programs to help start-ups and small businesses bring innovative battery technologies to market. Initiatives like the European Institute of Innovation and Technology's InnoEnergy program can serve as a model for Australia to support early-stage companies in the battery sector. **Foster a supportive regulatory environment**: Streamline regulations and provide clear guidance to battery technology developers and manufacturers to facilitate faster commercialization of innovative solutions. The South Korean government's supportive regulatory framework for battery manufacturing, including tax incentives and streamlined permitting processes, has contributed to the country's success in the battery market. **Develop national and international research networks**: Establish research networks and collaborations with international partners to access global expertise and resources. The European Battery Alliance, which connects various stakeholders across Europe's battery value chain, is an example of a successful research network that Australia can emulate. **Promote skills development and workforce training**: Invest in education and training programs to develop a skilled workforce capable of meeting the demands of the rapidly evolving battery sector. Programs like the Energy Storage Workforce Innovation Center in the US are examples of initiatives focused on workforce development in the battery industry. **Encourage private investment**: Create incentives for private investment in battery R&D and commercialization, such as tax credits and risk-sharing mechanisms, to attract more capital into the sector. The US Investment Tax Credit (ITC) for energy storage projects is an example of a successful policy that encourages private investment in the industry.

Q2.2: How could Australia best promote its strengths in R&D to grow domestic battery industries?	**Create a national battery strategy**: Develop a comprehensive national strategy that highlights Australia's R&D capabilities and sets clear targets and objectives for the domestic battery industry. This strategy can help align the efforts of various stakeholders, including researchers, industry players, and government agencies. **Foster industry clusters and innovation hubs**: Encourage the establishment of battery industry clusters and innovation hubs where research institutions, start-ups, and established companies can collaborate, share resources, and drive innovation. Examples of successful innovation hubs include the Battery 2030+ initiative in Europe and the New York Battery and Energy Storage Technology Consortium (NY-BEST) in the United States. **Increase public and private investment in R&D**: Boost funding for battery R&D from both public and private sources to support the development of innovative technologies and their commercialization. This could include setting up dedicated funding programs, offering tax incentives, and establishing public-private partnerships. **Promote international collaboration**: Encourage partnerships with international research institutions, industry players, and governments to access global expertise, resources, and markets. Joining initiatives like the Global Battery Alliance can help Australia expand its R&D network and gain exposure to global best practices. **Develop a strong intellectual property (IP) framework**: Strengthen Australia's IP framework to protect the innovations and technologies developed by its researchers and companies, and facilitate technology transfer and commercialization. **Build a skilled workforce**: Invest in education and training programs to develop a workforce with the necessary skills to support the growth of the domestic battery industry. This could include creating specialized degree programs, offering vocational training, and developing targeted reskilling initiatives for workers transitioning from other industries. **Showcase Australian battery innovations**: Organize international conferences, trade shows, and industry events to showcase Australia's battery R&D capabilities and promote domestic industry players to a global audience. Participating in events like The Battery Show in the US and Europe can help Australian companies gain visibility and build connections with international partners.
Q2.3: What steps should governments, or a Growth Centre-like entity, take to support growth of domestic battery industries?	**Foster collaboration between stakeholders**: Establish a platform for collaboration between industry, academia, and government, similar to the European Battery Alliance (EBA), which aims to create a competitive and sustainable battery value chain in Europe by fostering collaboration among stakeholders, providing financial support, and promoting innovation. **Invest in R&D and innovation infrastructure**: Develop specialized battery manufacturing labs and research facilities, inspired by the U.S. Department of Energy's Battery Manufacturing Labs, which focus on advanced battery manufacturing and materials research. **Provide financial incentives and support**: Implement funding programs, tax incentives, and grants for battery R&D, commercialization, and manufacturing, akin to Germany's "Battery Cell Research Production" initiative, which offers financial support for domestic battery cell production. **Encourage workforce development**: Develop training programs and initiatives to create a skilled workforce capable of meeting the demands of the growing battery industry, similar to the UK's Faraday Institution, which focuses on battery research, innovation, and workforce development. **Promote international collaboration**: Strengthen international partnerships with leading battery manufacturing countries and organizations to share knowledge, expertise, and resources, thereby enhancing Australia's position in the global battery market. **Implement policies to attract investment**: Create a favourable investment climate for battery-related businesses by implementing policies that reduce barriers to entry, streamline regulatory processes, and promote transparency.
Theme 3: Encouraging investment to grow our battery industries	

Q3.1: What are the barriers to investing in Australia's battery industries, and how can they be mitigated? How can governments encourage more investment?	**High upfront capital costs**: Investing in battery manufacturing and infrastructure requires significant initial capital. Governments can mitigate this by providing financial incentives, such as grants, low-interest loans, or tax breaks, to encourage private investments in the sector. For example, the US Department of Energy's Advanced Technology Vehicles Manufacturing (ATVM) Loan Program offers low-interest loans to support the development of advanced technology vehicles and their components. **Regulatory barriers**: Complex and time-consuming regulatory processes can hinder investment. Streamlining regulations and offering a single-window clearance system can make it easier for businesses to navigate the regulatory environment. The European Union's "One Stop Shop" initiative simplifies regulatory processes for businesses operating across multiple member states. **Lack of skilled workforce**: A skilled workforce is essential for the growth of the battery industry. Governments can support workforce development through targeted education and training programs. The German "Fachkräfte für Batterietechnologie" (Skilled Workers for Battery Technology) program aims to train professionals in battery technology and foster industry-academia partnerships. **Limited domestic and international market access**: Governments can facilitate market access by removing trade barriers and fostering collaborations between domestic and international companies. For instance, the European Battery Alliance brings together industry stakeholders to develop a competitive and sustainable battery value chain in Europe. **Insufficient R&D support**: Governments can promote R&D in the battery sector through funding, tax incentives, and research collaborations between industry and academia. The South Korean government's support for its domestic battery industry has led to the growth of leading companies like LG Chem, Samsung SDI, and SK Innovation. To encourage more investment in Australia's battery industries, the government can: • Establish public-private partnerships (PPPs) to share risks and combine resources for large-scale projects. • Create a dedicated agency or growth centre to coordinate and streamline efforts in the battery sector, similar to the Powering Australia Industry Growth Centre mentioned in the National Battery Strategy. • Support the development of industry clusters and technology parks, such as the European Institute of Innovation and Technology's (EIT) InnoEnergy, which brings together businesses, research institutions, and universities to foster innovation in sustainable energy. • Foster international collaborations and join global initiatives, like the Global Battery Alliance, which aims to create a sustainable and responsible battery value chain.
Q3.2 What areas could Australian-made batteries have a competitive advantage for use in Australia and for export?	Australian-made batteries can have a competitive advantage in several areas, both for domestic use and export, by leveraging international policies, business-led programs, and Australia's unique strengths. Some of these areas include: **Renewable energy storage**: Australia has an abundance of solar and wind resources, making it a prime location for renewable energy generation. By developing batteries tailored for renewable energy storage, Australia can capitalize on its domestic market and export to countries with growing renewable energy sectors. The International Renewable Energy Agency (IRENA) provides a platform for collaboration and knowledge sharing among countries to promote renewable energy solutions. **Electric vehicles (EVs):** The global shift towards EVs offers a significant market opportunity for Australian-made batteries. Collaborating with international EV initiatives, such as the Electric Vehicles Initiative (EVI) and the Global EV Pilot City Programme, can help Australia gain insights into market trends and best practices, positioning its battery industry for export success. **Grid-scale energy storage**: As countries transition to renewable energy, there is a growing need for large-scale energy storage solutions to stabilize power grids. Australia can leverage its expertise in battery technology and export grid-scale storage systems to countries implementing renewable energy policies, like the European Union's Renewable Energy Directive. **Off-grid and remote applications**: Australia's vast geography and remote locations require reliable off-grid power solutions. Australian-made batteries can have a competitive advantage in providing off-grid energy storage systems for remote communities, mining, and telecommunication sites. Export opportunities may arise in developing countries and remote areas with similar needs. Programs like the World Bank's Lighting Global initiative, which supports off-grid solar solutions in developing countries, can provide potential export opportunities. **Niche and specialized applications**: Australian battery manufacturers can focus on developing batteries for specific sectors, such as marine, aviation, agriculture,

	or defence, where unique requirements create opportunities for specialized solutions. Collaboration with international organizations, like the International Civil Aviation Organization (ICAO) for aviation batteries, can provide valuable insights and market access.
Q3.3: What functions or forms of help should the Powering Australia Industry Growth Centre deliver to support Australian battery industries?	**Facilitate collaboration**: The Growth Centre should act as a hub for collaboration among government, industry, academia, and research institutions, both domestically and internationally. This collaboration can promote knowledge sharing and joint R&D efforts. Participation in global initiatives, such as the WBCSD's Energy program, can help Australia stay informed of international trends and best practices. **Accelerate commercialization**: Support should be provided to help innovators and start-ups bring their battery technologies to market. This may include incubation and acceleration programs, access to funding, and mentorship. Learning from successful international models, like the US Department of Energy's ARPA-E program, can guide the Growth Centre in promoting commercialization. **Provide market intelligence**: The Growth Centre should help companies navigate the global battery market by providing information on market trends, emerging technologies, and regulatory developments. Involvement in international forums, such as the Clean Energy Ministerial and Mission Innovation, can provide insights into global market opportunities. **Promote international partnerships**: The Growth Centre should foster partnerships with international organizations, companies, and research institutions to facilitate technology transfer, joint ventures, and access to global supply chains. Engaging with international initiatives, such as the Global Battery Alliance, can help Australian battery industries forge strong connections globally. **Foster workforce development**: To ensure the growth of the battery industry, the Growth Centre should support workforce development by identifying skill gaps and promoting relevant education and training programs. Collaborating with international organizations, like the International Energy Agency (IEA), can provide insights into best practices for workforce development in the energy sector. **Advocate for supportive policies**: The Growth Centre should work closely with government stakeholders to develop and advocate for policies that encourage investment, innovation, and growth in the battery industry. Learning from successful international policies, such as the European Union's Strategic Action Plan on Batteries, can guide Australia in creating a supportive policy environment. Accelerate commercialization: Support should be provided to help innovators and start-ups bring their battery technologies to market. This may include incubation and acceleration programs, access to funding, and mentorship. Learning from successful international models, like the US Department of Energy's ARPA-E program, can guide the Growth Centre in promoting commercialization. **Provide market intelligence**: The Growth Centre should help companies navigate the global battery market by providing information on market trends, emerging technologies, and regulatory developments. Involvement in international forums, such as the Clean Energy Ministerial and Mission Innovation, can provide insights into global market opportunities.

Q3.4: How can the additional advantages of a precinct model and collaborative vertical integration be achieved for our battery industries?	**Establishing a Battery Manufacturing Precinct**: The creation of a dedicated battery manufacturing precinct, similar to the European Battery Alliance or the Swedish initiative Northvolt, can attract investment, promote economies of scale, and foster the development of a local battery ecosystem. A precinct can provide shared infrastructure, resources, and services, enabling businesses to collaborate, share knowledge, and reduce costs. **Encouraging cross-sector collaboration**: Collaboration among businesses, government, research institutions, and non-governmental organizations is essential for driving innovation and sharing best practices. The WBCSD's Transforming Heavy Transport project, which aims to accelerate the deployment of zero-emission vehicles, can serve as an example of successful cross-sector collaboration. **Facilitating supply chain integration**: By fostering partnerships between companies across the battery value chain, the precinct can promote vertical integration, reduce costs, and improve efficiency. A successful example is the Gigafactory model by Tesla and Panasonic, which demonstrates the benefits of co-locating battery manufacturing and assembly operations. **Supporting local sourcing and circular economy**: Encouraging businesses within the precinct to source materials and services locally can generate economic benefits and reduce environmental impacts. Implementing circular economy principles, such as recycling and remanufacturing, can minimize waste and enhance sustainability. The WBCSD's Factor10 initiative, which focuses on scaling up circular economy solutions, can provide valuable insights. **Developing a skilled workforce**: The precinct should collaborate with educational institutions and industry partners to develop relevant training programs and foster a skilled workforce. International programs, such as the European Commission's Skills Agenda for Europe, can offer valuable guidance in addressing workforce needs in the battery sector. **Attracting international partners**: Engaging with international companies, research institutions, and organizations can help the precinct access global expertise, markets, and supply chains. Participation in international forums, such as the Global Battery Alliance, can provide valuable networking opportunities and global exposure.
Theme 4: Creating the enabling environment for industry growth	
Q4.1: What can be done to develop the workforce necessary for domestic battery industries?	**Industry-academia collaboration**: Engage educational institutions, such as universities and technical schools, to develop industry-specific curricula and training programs that address the skill requirements of the battery sector. Successful examples include Germany's Fraunhofer Institute for Manufacturing Engineering and Automation IPA and the United States' Argonne National Laboratory. **Apprenticeship and internship programs**: Encourage companies in the battery industry to offer apprenticeships, internships, and co-op programs, providing hands-on experience and training for the workforce. The WBCSD's Talent Accelerator program can serve as a model for such initiatives. **Upskilling and reskilling initiatives**: Implement programs to upskill and reskill workers from other industries, focusing on transferable skills relevant to the battery sector. The European Commission's Skills Agenda for Europe offers valuable insights into addressing workforce needs through reskilling and upskilling initiatives. **Collaboration with international partners**: Partner with international organizations and businesses to access global expertise and share best practices in workforce development. Participation in global initiatives, such as the WBCSD's Future of Work project, can help identify skill gaps and emerging trends in the battery industry. **Attracting international talent**: Develop policies and incentives that attract skilled workers and experts from abroad, enhancing the domestic talent pool and fostering a diverse workforce. Examples of such policies include the Global Talent Stream in Canada and the Tech Nation Visa in the United Kingdom. **Promoting diversity and inclusion**: Foster a diverse and inclusive work environment to attract talent from diverse backgrounds and demographics. The WBCSD's CEO Guide to Human Rights provides valuable guidance on promoting diversity, inclusion, and equal opportunity in the workplace. Continuous learning and development: Encourage companies to invest in ongoing training and development programs for their employees to keep up with the rapidly evolving battery industry. The WBCSD's reSource project, which focuses on enhancing human capital through lifelong learning, offers valuable insights into fostering continuous learning.

Q4.2: How can Australia best maintain a world leading environmental, social and governance reputation for products?	**Adhering to international standards and guidelines**: Comply with and exceed global ESG standards such as the UN Global Compact, the Sustainable Development Goals (SDGs), and the Global Reporting Initiative (GRI). Ensure that Australian products align with these standards to demonstrate commitment to sustainability and responsible business practices. **Adopting best practices from global leaders**: Learn from leading international companies and countries with strong ESG reputations. Adopt their best practices and adapt them to the Australian context. **Collaboration with global organizations**: Partner with international organizations and initiatives, such as the WBCSD and the Ellen MacArthur Foundation, to access resources and expertise in sustainable product design, circular economy principles, and ESG performance measurement. **Industry-wide sustainability initiatives**: Encourage Australian industries to develop and implement sector-specific ESG guidelines and initiatives. The WBCSD's Sectoral Decarbonization Approach (SDA), Science-Based Targets Initiative (SBTi), and SDG Sector Roadmaps are examples of collaborative industry efforts to address sustainability challenges. **Transparent reporting and disclosure**: Promote transparent ESG reporting and disclosure by companies, following international reporting frameworks such as GRI, the Task Force on Climate-related Financial Disclosures (TCFD), and the Sustainability Accounting Standards Board (SASB). **Certification and eco-labelling**: Implement credible certification and eco-labelling programs to help consumers identify sustainable products. International examples include the Forest Stewardship Council (FSC), the Marine Stewardship Council (MSC), and the EU Ecolabel. **Strengthening local and regional supply chains**: Develop and support local and regional supply chains that prioritize sustainability and ethical practices. Initiatives like the WBCSD's Circular Economy program can offer guidance on sustainable supply chain management. **Incentivizing innovation and sustainability**: Offer incentives for businesses to invest in innovative technologies, sustainable production methods, and ESG initiatives. The WBCSD's Low Carbon Technology Partnerships initiative (LCTPi) demonstrates how businesses can collaborate and drive innovation in sustainable technology. Additionally, the WBCSD's SDG Sector Roadmaps provide industries with guidance on aligning their strategies and operations with the SDGs, promoting collaboration and innovation across sectors.

Q4.3: What can be done to give confidence that Australian product safety risks are effectively understood, mitigated and managed?	**Adopting international safety standards**: Ensure that Australian products comply with or exceed international safety standards such as those set by the International Organization for Standardization (ISO), the International Electrotechnical Commission (IEC), and the European Union's CE marking. Comprehensive risk assessments: Perform regular risk assessments to identify, evaluate, and address potential safety risks in products and manufacturing processes. Follow globally recognized risk assessment frameworks and methodologies such as ISO 31000. Implementing robust quality management systems: Adopt and implement internationally recognized quality management systems like ISO 9001 to ensure consistent product quality and safety across industries. **Collaboration with global organizations**: Work closely with international organizations and industry associations to access expertise, resources, and best practices in product safety management, such as the International Consumer Product Health and Safety Organization (ICPHSO) and the Product Safety Forum of Europe (PROSAFE). **Capacity building and training**: Invest in capacity building and training programs to improve the skills and knowledge of stakeholders involved in product safety management, including manufacturers, importers, distributors, and regulators. The WBCSD's capacity building programs and initiatives, such as the Global Network and the Leadership Program, can serve as valuable resources. **Transparent reporting and disclosure**: Encourage transparent reporting and disclosure of safety-related information by companies, including incident reporting, corrective actions, and safety performance indicators. Adopt international reporting frameworks and guidelines, such as the Consumer Product Safety Commission (CPSC) guidelines in the United States. **Product recalls and safety alerts**: Establish a robust and efficient product recall system to address safety issues promptly, and ensure timely communication of safety alerts to consumers and other stakeholders. **Public-private partnerships**: Foster collaboration between governments, businesses, and research institutions to develop innovative solutions and technologies that enhance product safety. The WBCSD's Low Carbon Technology Partnerships initiative (LCTPi) offers an example of collaborative efforts to drive innovation. Consumer education and awareness: Develop and implement consumer education and awareness campaigns to inform consumers about product safety risks and promote responsible product use.
Q4.4: How can governments and industry ensure circular economy principles are incorporated into the life cycles of batteries made and used in Australia?	**Adopt international best practices**: Follow international best practices and guidelines related to battery life cycle management, such as the European Union's Battery Directive, which promotes the sustainability of battery production and use. **Encourage design for sustainability**: Incentivize battery manufacturers to design products that are easily repairable, reusable, and recyclable. Implementing Extended Producer Responsibility (EPR) schemes can help hold manufacturers accountable for the environmental impact of their products. **Develop recycling infrastructure**: Invest in the development of advanced recycling infrastructure and facilities to enable efficient recovery and recycling of valuable materials from end-of-life batteries. Collaboration with international organizations and initiatives, such as the Global Battery Alliance, can facilitate knowledge sharing and technology transfer. **Implement policies promoting a circular economy**: Establish regulatory frameworks and policies that support circular economy principles, such as waste reduction targets, recycling quotas, and landfill bans for batteries.