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RE: Issues Paper - National Battery Strategy

SwitchDin welcomes the opportunity to provide feedback to the Albanese Government's Issues Paper for the National Battery Strategy.

SwitchDin is an energy software company that bridges the gap between energy companies, equipment manufacturers and energy end users to integrate and manage energy resources on the grid. SwitchDin's technology enables our clients to build and operate vendor-agnostic virtual power plants (VPPs) and microgrids, and to optimize site performance across fleets of diverse assets. Founded in 2014 in Australia, SwitchDin is currently in the process of expanding its presence in the United States, the European Union and New Zealand.

In this submission we focus on the importance of software for enabling integration and commercialisation to move up the battery value chain. This is an area of existing advantage for Australia that we should build upon to support growth of our battery industry in domestic and export markets.

Software is the key enabling technology needed to turn a battery from a commodity product into a safe, smart consumer-focused solution. Our main request is for clear direction from the government that software for integrated design of battery systems and for the integration of battery systems into electricity networks is within the scope of the National Battery Strategy.

Australia's world leading market position in the integration of consumer energy resources¹ (CER) into distribution networks gives us a unique competitive advantage. Australia can capitalise on this advantage, by exporting solutions that utilise battery energy storage, rather than exporting batteries for commercialisation and integration by others.

In the early stages of the development of an Australian battery industry, there is an important role for the government to strengthen collaboration between industry and researchers by providing financial support to research and development (R&D), establishment of test facilities, demonstration projects, pilot schemes, and early stage commercialisation and product development. As the industry matures, there will be opportunities for governments to showcase Australian technology and assist with the development of export markets.

¹ Consumer energy resources include rooftop solar, batteries, electric vehicles and flexible load.

Key Recommendations

1. Clarify that software is within the scope of the National Battery Strategy

We welcome the government's willingness to support "integrated design" of battery products. Software is the key enabling technology needed to turn a battery from a commodity component to a safe, smart user-focused solution.

We strongly urge the Albanese Government to confirm that software for battery sub-systems and to enable smart integration of battery systems into user applications is within the scope of the National Battery Strategy. These software elements are required to deliver truly integrated smart battery products.

2. Capitalise on Australia's world-leading innovations in distributed energy systems

Australia is the world leader in distributed energy innovations such as virtual power plants (VPPs), community batteries, microgrids and the dynamic operating envelope (DOE) approach. We should take advantage of these value-adding differentiators by ensuring Australian solution providers are exporting end-to-end smart battery storage solutions rather than simply exporting battery components for others to commercialise and integrate and value add.

3. Support R&D and early stage commercialisation

In the early stages of Australia's battery industry, governments should invest in grants for R&D, establishment of testing facilities, demonstration projects, pilot schemes, early stage product development and commercialisation, and focus on supporting the end-to-end supply chain so as to bring complete integrated solutions to market.

Responses to questions raised in the Issues Paper

Theme 1: Moving up the value chain

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

Australia is the world leader in the integration of CER into distribution networks. The Australian distributed energy industry has led the development of innovations such as VPPs, community batteries, microgrids and DOEs. Australia is in the leading position due to our exceptionally high and rapid uptake of rooftop solar, which has necessitated new approaches to CER integration and the use of smart software solutions to manage batteries. We estimate that Australian technology in this area is about 4 to 5 years ahead of the United States (US) and the European Union (EU).

This is a differentiator that Australia can capitalise upon, by value adding with smart software, Australia can export full battery storage solutions, rather than just exporting battery components for commercialisation and value adding by others.

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 has a unique opportunity to provide end-to-end solutions, beginning with mining of raw material, manufacture of battery cells and batteries, design of battery systems and integration of battery systems with smart capabilities into consumer- and utility- solutions.

The Issues Paper notes the potential for 34,700 jobs and \$7.4 billion in gross economic value that could arise from investment in Australia's battery industry, based on a scenario that assumes investment in "diversified battery industries" in contrast with a "mining-focused" investment strategy that would yield an estimated 18,700 jobs and \$4.1 billion in gross economic value².

We concur with the observation in the issues paper that, "Growth in urban and regional battery use could be leveraged in Australia to offer integrated design and after-service solutions". We urge the government to confirm that support for "integrated design" of battery products includes support for Australian developers of battery-related software and solutions.

There are multiple layers of firmware and software needed to turn a simple battery into a consumer- or utility- focused application. These layers include:

- The firmware internal to the battery that makes it work,
- The firmware and software that makes a battery system 'smart', and ready to commercialise,
- The external and internal software and communication systems needed for coordination of battery systems to provide smart services for the electricity system.

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

The government should support Australia's battery industries by:

- Investing in grants for research and development (R&D),
- Enabling access to test facilities,
- Providing financial support to develop skills and capabilities,
- Funding pilot schemes and early commercial trials,
- Providing access to low interest finance for early stage commercialisation of products, and
- Playing a coordination role that brings together manufacturers, researchers and software providers.

² Accenture, 2021, *Future Charge: Building Australia's Battery Industries*, Future Battery Industries Cooperative Research Centre

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?

In order to commercialise our battery related research, Australia should support the full value chain from mining to manufacturing through to deployment of solutions. Customers don't want batteries per se - they want solutions to problems. Batteries can play a crucial role in delivering the solutions customers are looking for.

The government has a crucial role to support companies taking minimum viable products through to market. This should involve:

- Grants for early stage commercialisation and product development,
- Support for pilot projects,
- Risk mitigation finance for early movers, and
- More procurement and use of batteries within the government sector.

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

The government should strengthen collaboration between researchers and industry by providing financial support for initiatives such as:

- Industry-based postgraduate research,
- Collaborative R&D grants,
- Industry-university collaboration, including curricula development, and
- Support international knowledge sharing, through exchange programs and visa arrangements.

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

Long term, sustainable growth of the domestic battery industry requires a focus on commercialisation, product development and bringing integrated solutions to market. Australia has an advantage in CER integration in distribution networks and the use of batteries in applications specific to our geography and circumstances. For example, our rapid rooftop solar uptake and the highly distributed nature of our electricity networks have driven the development software and applications for CER integration in Australia far in advance of other developed countries. Similarly, our geography has led to advances in microgrids and remote area power systems. Australian expertise in remote area systems could be exported to overseas markets where grid access is unreliable or does not exist (e.g. towns, villages and mining operations in remote areas).

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?

Access to early stage capital is challenging. Government can assist in this area with a form of guarantee mechanism or financial risk sharing.

Establishing overseas markets is challenging for small to medium Australian enterprises. Governments can create opportunities to showcase innovative products through programs such as AusTrade and targeted trade initiatives.

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

Australia already has a competitive advantage in battery applications suited to our geography and circumstances, such as:

- Integration of batteries into distribution networks with very high rooftop solar penetration,
- Use of medium-scale batteries of distribution networks,
- Harnessing thousand of batteries together into VPPs,
- Microgrids and remote area power systems to service remote populations, and
- Industrial-scale use of batteries and distributed energy in mining and related sectors.

Overseas markets for applications such as these are expected to emerge in coming years. With government support, Australian producers that utilise fully integrated battery and distributed energy software to deliver full customer solutions will be well placed to capture export market share.

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

A key role for the Powering Australia Industry Growth Centre should be showcasing successful pilot projects and early stage product development, and coordinating commercialisation support, facilitating access to global markets, and sector capacity development initiatives.

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

There are benefits to a precinct model. The Newcastle Innovation Hub, for example, includes innovators such as SwitchDin, CSIRO, University of Newcastle, Renaissance Energy, MG Thermal and others. Physical proximity facilitates networking and opportunities for creation of a local pool of talent and builds a regional differentiation which benefits other sectors. For example, links with the Hunter Region Renewable Energy Zone initiative, and the Nett-Zero Industry Growth program thereby leveraging the investment flows into renewable energy and green manufacturing.

Theme 4: Creating the enabling environment for industry growth

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

In the early stages of industry development, there is an important role for government to strengthen collaboration between researchers and industry by providing financial support for initiatives such as:

- Industry-based postgraduate research,
- Collaborative R&D grants,
- Industry-university collaboration, including curricula development, and
- Support international knowledge sharing, through exchange programs and visa arrangements.

As the industry matures, the focus of government support should shift to market development. This would involve support for pilots and demonstration of new applications, followed by initiatives to showcase Australian technology in overseas markets.

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

Australia should use our environmental, social and governance reputation to differentiate ourselves from our competition. The key to this will be for Australia to take control of its supply chain and to maximise the traceability of the 'chain of custody' from raw materials through to consumer products.

Australia should insist on high levels of compliance by our local manufacturers and consider applying

those standards to all battery products, whether they are imported, exported and sold domestically.

By developing and building upon systems for product certification we can communicate our advantages with transparency and integrity.

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

To mitigate Australian product safety risks, the government should:

- Require Australian battery systems to be certified as compliant with all relevant Australian and international standards,
- Support the development of new Australian standards,
- Support Australian companies to engage with the international standard setting process,
- Consider establishing a National Technical Regulator for CER technologies including batteries and other distributed energy products,
- Provide grant funding for the establishment of Australian product testing and certification facilities,
- Resource the enforcement of standards through regulation,
- Support the integration of training for supply chain stakeholders into relevant technical certification programmes, and
- Ensure that imported batteries solutions are required to meet the same high standards expected of batteries manufactured and sold in Australia.

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

The most important step will be the establishment of facilities able to recycle used batteries. This could be achieved through a combination of grant programs and concessional finance. When suitable facilities have been established, consideration can be given to regulatory responses such as landfill bans and regulatory frameworks for extended producer responsibility.

To ensure there is an economic supply of batteries to recycle, schemes to incentivise recycling by consumers may also be required.