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Electricity Authority
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By email: fsr@ea.co.nz

Submission – Regulatory Roadmap for Battery Energy Storage Systems

1. Introduction

1.1. Orion welcomes this opportunity to provide feedback on the Electricity Authority's (Authority) paper, 'A regulatory roadmap for battery energy storage systems' (Roadmap).

1.2. No part of this submission is confidential.

1.3. Orion owns and operates the electricity distribution infrastructure in Central Canterbury, including Ōtautahi Christchurch city and Selwyn district. Our network is both rural and urban and extends over 8,000 square kilometres from the Waimakariri River in the north, to the Rakaia River in the south; from the Canterbury coast to Arthur's Pass. We deliver electricity to more than 228,000 homes and businesses and are New Zealand's third largest Electricity Distribution Business (EDB).

2. General Support

2.1. Orion supports the Authority in its efforts to develop regulatory settings that will help to ensure a secure, reliable, sustainable, and affordable electricity system. To support that objective, it is increasingly clear that stimulating the uptake of battery energy storage systems (BESS) and building a robust flexibility market is essential.

2.2. In that context, Orion supports the Roadmap in principle; acknowledging that the 'devil' will be in the details of the individual initiatives comprising the Roadmap.

2.3. We consider that the following factors should be considered in the development of the Roadmap and its constituent initiatives:

- Targeted and proportional regulatory development
- Overseas regulatory settings
- Part 6 review
- Maximising operational value
- Technical specifications and standards
- Communications protocols
- EDB-owned batteries
- Price signals

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- Industry and agency collaboration and coordination

3. Targeted and Proportional Regulatory Development

3.1. BESS will play a critical, and likely enduring, role in the development and operation of a modern and robust electricity system that will support New Zealand's decarbonisation objectives and obligations.

3.2. However, BESS cannot currently be considered to have moved beyond being an emerging technology within New Zealand's electricity system, with installations in relatively low numbers, both at grid-scale and as part of 'mass-market' connections.

3.3. To encourage greater uptake, regulatory settings that deliver understanding, incentives and protections to consumers is essential:

- Understanding: Widespread awareness of the direct and indirect benefits of investing in BESS needs to be developed among all electricity consumers;
- Incentives: Consumers need to both understand the benefits that can be derived from owning BESS and see tangible rewards that are aligned with their understanding and expectations;
- Protections: Consumers need adequate protections regarding the physical assets they choose to invest in, which can be delivered by fit-for-purpose technical and safety regulations, and commercially, by regulation that does not 'over promise and under deliver' incentives, relative to expectations.

3.4. For this reason, we consider that regulatory development should be targeted and proportional. While, as an industry, our understanding of how Consumer Energy Resources (CER) are likely to evolve, and the role they will play within the electricity system, is reasonably well developed, there are still uncertainties. There is a danger in developing a regulatory regime based on a vision of an endpoint that may turn out either wholly or materially different.

3.5. To address uncertainty, we consider that regulatory development should:

- be targeted at 'real and tangible' issues, as opposed to suspected, nascent or theoretical issues;
- be focussed on maximising the long-term benefit of all electricity consumers; e.g., consider those less well-placed to directly participate in CER;
- be incremental, solving only the problem at hand;
- not close-off alternative approaches too early (least regrets); and
- be easily reversible, if required.

4. Overseas Regulatory Settings

4.1. We encourage the Authority to consider the regulatory settings in overseas jurisdiction where BESS deployments are more advanced and adopting those settings to the extent that they are consistent with the New Zealand context, and where adoption would meet the targeted and proportionate principle, discussed above.

4.2. The Australian regulatory settings appear to be supportive, with rapidly increasing installations of BESS both at grid-scale and as part of CER. Adoption of relevant Australian settings may result in more efficient and cost-effective regulatory setting, and the resulting commonality between the two jurisdictions may reduce barriers to Australian investment in the New Zealand market.

5. Part 6 Review

5.1. In our view, a significant omission in the Roadmap is a comprehensive review of Part 6 of the Code - elements of which are no longer fit-for-purpose. For example:

- the recent decision requiring distributors to develop negative prices for electricity injection during peak periods allows that price to apply network-wide (i.e., non-locational). That means, for consumers' injection into unconstrained locations on a distributor's network, the incremental cost principle in Schedule 6.4 is 'violated';
- The recent decision requiring distributors to develop pioneer schemes for load connections specifies a different term from the pioneer scheme for distributed generation (DG) specified in Schedule 6.4(2)(k)-(m).

5.2. Orion recommends that a substantive review of Part 6 of the Code is added to the BESS Roadmap.

6. Maximising Operational Value

6.1. Regulatory settings should be aimed at maximising the value that consumers can derive from investing in BESS, in order to accelerate uptake. Settings should enable a pathway for investors in BESS to be compensated for the following activities (without limitation):

- reserves participation (generation and interruptible);
- energy arbitrage;
- relief of infrastructure constraints (locational peak demand reduction);
- frequency keeping;
- maintaining system inertia (when coupled with grid-forming inverters);
- black start (when coupled with grid-forming inverters); and
- sub-cycle response to voltage disturbances, allowing for transmission to be used above N-1 voltage constraints (when coupled with grid-forming inverters).

6.2. A key concern we have, regarding the energy transition, is how we make sure consumers have access to the right information to make informed choices on some complex matters. There is information available from various sources, but it is not always objective or free from bias and relies on consumers seeking it out.

6.3. We recommend that the Authority work with other agencies (for example, EECA) to secure funding for a public campaign focussed on the benefits of CER to the electricity system and the rewards that can be derived from participation.

7. Technical Specifications and Standards

7.1. The ability to maximise the value of BESS investment, as described in section 5, above, relies on adoption and mandating of appropriate technical specifications.

7.2. As an example, BESS can support grid-forming inverters. The Authority should consider how regulation needs to change to allow New Zealand to maximise the use of grid-forming inverters as part of the Roadmap. Again, looking at the Australian approach should be productive. Grid forming inverters are not unproven technology, and regulation needs to support the value they can provide.

7.3. Similarly, standardisation should be considered without delay, to ensure that households invest in batteries that can provide virtual power plant (VPP) services in the future. Looking to the past, ripple control is an outstanding example of standardisation unlocking significant system benefits, and we don't want to miss the opportunities that controllable batteries can provide.

7.4. While inverter standards are referenced within the Code, there are options within those standards which could see limitations created if consumers select 'basic' inverters that do not carry the optional functionality of most value to the electricity system. Minimum required functionality must be specified within the Code.[1]

7.5. We recommend, in conjunction with the substantive review of Part 6 of the Code recommended at section 5, that the Authority work with industry and other agencies[2] to enhance the technical specifications and consider mandating the functionality that we know will be of benefit to the electricity system as CER grows to scale.

8. Communications Protocols

8.1. It is likely that there will be consumer demand for managed services[3], in conjunction with supportive pricing, similar to the managed hot water services have been reliably delivered for decades. Regardless of who becomes the provider of those managed services (that could be a flexibility trader or aggregator) – we need to specify the communication protocols and related management infrastructure now.

8.2. In our view, we do not have time to allow these matters to evolve haphazardly, as we allowed advanced meter specifications to evolve over the past 20+ years.

8.3. We recommend that the Authority add a workstream to the BESS Roadmap that will consider the requirements for communications protocols, seeking input from industry (including suppliers & manufacturers) and other regulatory agencies as needed.

9. EDB-owned Batteries

9.1. The Roadmap should not preclude Transpower or EDBs from owning grid-scale BESS. While the deployment of grid-scale BESS is nascent, there may be situations when CER is insufficient to relieve network constraints and market offerings for grid-scale BESS capacity do not emerge. In those circumstances EDBs should not be constrained from being the 'provider of last resort'.

9.2. While we understand the concerns that exist regarding EDBs potentially favouring their own assets, and chilling the development of flexibility markets, there are greater practical impediments to near-term procurement of flexibility, and the regulations made under Part 4 of the Commerce Act 1986 provide appropriate protections.

10. Price Signals

10.1. Orion will continue to develop and refine its pricing, including the newly mandated negative prices for injection of electricity into our network during peak demand periods, to support the uptake of BESS; however, we think it is important that consumers can see reasonable price signals that incentivise peak demand response. We consider that distribution price signals may understandably be muted when 'washed' through retail pricing plans and potentially 'crowded out' as retailers focus on wholesale market concerns.

10.2. Directly contracting with flexibility service providers for demand/injection response may weaken the importance of more transparently passing through distribution price signals, in the longer term; however, we recognise the emerging nature of the flexibility services market and the uncertainty that exists over how fast that market will develop to a scale that provides real utility. Further, we understand that market forces may cause retail pricing to align more closely to distributor price signals and incentivise peak-period avoidance, over time.

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[1] We are open to specification of required functionality occurring by other means than directly within the Code. The point being that we mustn't miss opportunities by allowing inverter functionality to be limited.

[2] For example, the Electricity Engineers' Association and the Energy Efficiency & Conservation Agency (EECA).

[3] Examples of managed services include 'dispatch' of BESS (discharge) and scheduled charging of electric vehicles.

10.3. We remain concerned that market development may not occur fast enough to play a genuinely supporting role in the timely uptake of BESS. We consider that the Authority should monitor, at short intervals, the degree to which retail consumer prices support the new energy future.

11. Industry and Agency Collaboration and Coordination

11.1. In this submission, we have drawn attention to technical matters like communications protocols and standards. Industry and other agencies have had a hand in developing useful guidance on technical matters. For example:

- EECA has sponsored the development of a publicly available standard (PAS) for guidance on residential photovoltaic (PV) and battery storage systems.
- The EEA has published technical guides for the connection of generating equipment, including inverter-based generating equipment.

11.2. While there is a need to develop greater specification of technical matters within Part 6 of the Code, Orion recommends that the Authority continues to work closely with the industry and other regulatory agencies to leverage the work already done, and to ensure that codified specifications are appropriate and fit-for-purpose.

12. Concluding Remarks

12.1. If you have any questions about this submission, please contact the undersigned.

Yours sincerely

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