Electricity Engineers' Association

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To: The Electricity Authority
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From: Electricity Engineers' Association of NZ

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Subject: EEA Submission – Electricity Authority's *Regulatory Roadmap for Battery Energy Storage Systems*

OVERVIEW

The Electricity Engineers' Association (EEA) welcomes the opportunity to provide feedback on the Electricity Authority's *Regulatory Roadmap for Battery Energy Storage Systems* (June 2025).

The EEA supports the Authority's commitment to ensuring regulatory settings keep pace with New Zealand's transition to a more distributed, renewable, and flexible electricity system. We consider battery energy storage systems (BESS) an essential component of future grid reliability and resilience. The roadmap outlines a comprehensive programme of work, and we commend the Authority for its coordination across market, operational, and distribution issues.

However, from an engineering and implementation perspective, there are areas where the EEA recommends further development, prioritisation, or collaboration to ensure the roadmap delivers practical outcomes and enables a consistent and safe approach across the sector. These include clarifying the roles of existing regulatory instruments (e.g. the ESRs and Part 6 of the Code), enhancing data access without duplicating registries, and addressing potential operational conflicts when BESS assets are engaged in multiple services.

Summary of Key Feedback

- Greater attention is needed to **standards alignment, interoperability, and installation safety**, particularly for small-scale BESS and in light of gaps in the Electricity (Safety) Regulations 2010.
- The roadmap should include a **national visibility strategy** for behind-the-meter BESS and enable access to complete, non-duplicative data-sharing protocols.
- The Authority should **accelerate work on system strength**, including grid-forming BESS and technical definitions.
- More **clarity is required around operational participation in multiple flexibility markets** and how conflicts between services (e.g. reserve vs. network support) will be managed.
- There is a need for **clearer alignment and role definition** between regulatory instruments (e.g. ESRs, Code, standards) and trialling frameworks.

- **Cybersecurity and critical infrastructure resilience** are insufficiently addressed.
- A **national framework for assessing flexibility market readiness** would support consistent rollout based on visibility, interoperability, dispatchability, and secure communications.
- Several initiatives would benefit from **deeper technical collaboration** with the EEA and our members.

Detailed Feedback

1: Standards, Safety, and Interoperability Gaps

The roadmap acknowledges EECA's residential PAS and the EEA's development of technical guidelines. However, it lacks a clearly defined pathway to align Code amendments with relevant safety and interoperability standards (e.g. AS/NZS 5139, 4777, 4755, IEEE 2030.5).

EEA Recommendation: We encourage the Authority to actively coordinate with MBIE, WorkSafe, EECA, Standards New Zealand and the EEA to align BESS-related regulatory settings with evolving safety and performance standards. This includes recognising the importance of interoperability protocols and controls at both LV and HV interfaces, which are critical for safe and scalable integration.

We note that the Electricity (Safety) Regulations 2010 remain outdated with respect to battery energy storage systems. They refer only to the 2005 version of AS 4777 and do not reference AS/NZS 4777.1:2024, AS/NZS 4777.2:2020, or the AS/NZS 4509 series. Furthermore, while photovoltaic systems are treated as high-risk prescribed electrical work (PEW), BESS are not, despite similar safety concerns. For instance, BESS inverters may not provide the short-circuit current necessary to reliably operate overcurrent protection devices within an installation. This presents safety and compliance risks that warrant regulatory attention. We recommend that alignment with updated standards and comprehensive regulatory coverage of BESS within the ESRs be considered a priority area for inter-agency coordination. This includes recognising the importance of interoperability protocols and controls at both LV and HV interfaces, which are critical for safe and scalable integration.

2: Visibility of Behind-the-Meter BESS and Data-Sharing Protocols

While the roadmap identifies visibility of small-scale BESS as a concern, it does not present a concrete action plan for enabling national coordination or asset registration. We recognise that distributed generation systems, including battery-only or hybrid PV-BESS, are currently registered in the Electricity Registry. However, completeness and accessibility of this data remain issues, particularly for distribution planning, system visibility, and operational coordination. We recommend that the

Authority consider how to enhance existing registry information and ensure access by relevant system operators, aggregators, and DER providers—rather than duplicating repositories.

EEA Recommendation: We recommend the Authority prioritise the development of a national data visibility and registration framework for BESS (e.g. via ICP registry or inverter-level telemetry) and establish clear data-sharing protocols to support distribution system operators, aggregators, and flexibility providers.

3: Grid-Forming Capabilities and System Strength

We acknowledge the reference to inverter-based technologies, but the roadmap provides limited technical direction on how system strength will be defined, maintained, or supported by advanced BESS.

EEA Recommendation: The Authority should elevate this workstream and jointly develop with Transpower and the EEA an implementation pathway for assessing and integrating grid-forming BESS (especially in weak grids, microgrids, or during black start scenarios). This includes considering standardised technical specifications and performance requirements.

4: Flexibility Markets and Non-Wires Alternatives

We support the Authority's intent to enable flexibility services, but the roadmap lacks clarity on practical mechanisms for flexibility procurement, pricing, and interoperability, particularly in distribution networks.

EEA Recommendation: The EEA encourages the Authority to co-develop flexibility market frameworks with distributors, aggregators, and DER operators. This includes addressing:

- Registration of flexible resources
- Interactions with DPP/INTSA mechanisms
- Ring-fencing considerations and investment neutrality
- Distribution network operational visibility and control requirements

A further implementation challenge arises from the potential for BESS assets to be simultaneously contracted or enrolled with multiple aggregators or service providers. For example, a single BESS might be committed for under-frequency reserve response while also offering flexibility to address local distribution constraints. These services may involve different triggers, performance expectations, and control priorities. Without careful coordination, this could result in conflicting dispatch signals or sub-optimal system performance. The roadmap should consider how to manage these multi-service

interactions, whether through aggregator coordination requirements, prioritisation frameworks, or embedded technical constraints.

In addition, to support a structured rollout of local flexibility markets, we recommend the Authority develop a set of national readiness criteria or assessment guidelines. These should include technical and operational benchmarks such as visibility of assets, interoperability standards, dispatchability of flexible resources, the availability of locational pricing signals, and the presence of secure control and communication protocols. Such a framework would help ensure flexibility markets are introduced in a technically sound, scalable, and equitable manner across the country.

5: Consumer-Scale BESS Incentives and Technical Hosting Capacity

While Task Force Initiatives 2A and 2C aim to increase uptake of distributed BESS, they are not currently aligned with technical readiness at the network level (e.g. voltage constraints, export limitations).

EEA Recommendation: The Authority should ensure these pricing and incentive reforms are matched with clear and enforceable technical guidance on hosting capacity, export constraints, and quality of supply management. The EEA is well placed to support this work through the Streamlining Connections Programme and ongoing technical guideline development.

6: Cybersecurity and Operational Resilience

Cybersecurity is noted only briefly. As more BESS assets and inverters are connected and remotely controllable, this poses growing risks for system security and public safety.

EEA Recommendation: We recommend the Authority work with CERT NZ, WorkSafe, and the EEA to develop minimum cybersecurity standards and operational resilience guidelines for BESS, particularly at grid-edge and distribution levels.

Given the proliferation of smart, remotely controllable devices at the grid edge, minimum cybersecurity safeguards should be treated as essential technical requirements, not merely market or policy concerns. Clear roles, responsibilities, and accountability frameworks will be needed as part of any scalable BESS integration.

7: Opportunities for Collaboration

The EEA supports the Authority's work and offers the following areas for direct engagement or co-design:

- **System strength and grid-forming capability:** Aligning technical standards with regulatory Code provisions.
- **Visibility and registration of distributed energy resources:** Leveraging EEA's coordination role across EDBs.
- **Flexibility market design:** Participating in the design of pilot or trial frameworks for market-based flexibility procurement.
- **Cybersecurity** and digital resilience for BESS and inverters.

We also recommend continued coordination across EECA, MBIE, the Commerce Commission, and Standards NZ through an inter-agency implementation forum focused on distributed energy integration.

Conclusion

The EEA appreciates the opportunity to provide this submission and acknowledges the significant effort the Authority has made to present a coherent and forward-looking roadmap. With further refinement and enhanced collaboration, we believe the roadmap can play a central role in enabling a safe, efficient, and consumer-led energy transition in New Zealand.

We also encourage the Authority to clarify the roles of various regulatory instruments, such as the ESRs, Part 6 of the Code, and emerging BESS technical guidelines, thus ensuring that there is a consistent and coordinated approach to BESS safety, performance, and market participation. Pilot programmes or demonstration trials could be valuable tools to test practical interoperability, visibility, cybersecurity and flexibility-market coordination challenges before wider implementation.

We look forward to continuing to support this work and welcome further discussion on how EEA and its members can contribute to its successful delivery.

Contact

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