Electricity Engineers' Association

Level 5, 40 Mercer Street
PO Box 5324
Wellington, New Zealand
Telephone: (04) 473 8600
Web: www.eea.co.nz

To: The Electricity Authority
OperationsConsult@ea.govt.nz

From: Electricity Engineers' Association of NZ

Date: 23 December 2025

Subject: EEA Submission – *Wholesale Market Arrangements for Battery Energy Storage Systems (BESS): Issues and Options Paper*

OVERVIEW

The Electricity Engineers' Association (EEA) welcomes the opportunity to comment on the Electricity Authority's *Wholesale market arrangements for BESS: Issues and options paper*. As utility-scale storage becomes an increasingly important component of Aotearoa's future electricity system, it is essential that market arrangements evolve in a way that is technically robust, operationally feasible, and aligned with long-term system security.

Overall, EEA is supportive of the direction of travel and agrees that the proposed changes represent a natural progression in recognising BESS as controllable, bi-directional system assets. The paper appropriately identifies many of the challenges associated with BESS integration, and we acknowledge the value of clearer, more consistent market arrangements.

However, BESS deployment is still in its early stages, and many supporting engineering, operational, and visibility capabilities across the system remain immature. For this reason, EEA emphasises the importance of:

Ensuring that new arrangements do not get ahead of operational readiness, particularly in relation to system operator tools, SoC telemetry, and coordination with distribution networks.

Managing emerging risks carefully as the system becomes more reliant on storage for firming, response, and balancing.

Setting clear expectations around data quality, interoperability, and technical observability, as these will be foundational to safe and efficient integration.

Our submission supports the overall regulatory objectives while highlighting operational and engineering risks that must be addressed to ensure safe implementation. This reflects the EEA's technical swim-lane and focus on system engineering, security, and practical operability across both transmission and distribution networks.

General Comments

1. Support for greater clarity in BESS arrangements

EEA agrees that establishing explicit, consistent treatment for BESS will reduce uncertainty for operators and support better system coordination. Recognising BESS as highly controllable assets capable of both import and export is technically appropriate and aligns with how these technologies behave in practice.

2. Importance of a security-first transition

While the direction is sound, the pace and sequencing of implementation matter. Many of the proposed arrangements rely on:

- dependable SoC telemetry,
- accurate and timely data exchange, and
- predictable interactions with distribution networks.

These capabilities are improving, but not yet fully mature. Introducing new obligations before these foundations are secure may unintentionally elevate operational risk.

3. State-of-charge as a critical dependency

EEA agrees that state-of-charge is a central constraint for BESS and supports mechanisms that allow it to be appropriately considered in the dispatch process. However, relying on SoC data without:

- validated accuracy thresholds,
- clear communication protocols, and
- agreed reliability expectations

could undermine both dispatch efficiency and system operator confidence. We therefore recommend a phased implementation, supported by clear requirements for data quality.

Insights from the Flextalk programme also demonstrate that without clearly defined interoperability and communications requirements, SoC-based control becomes significantly less predictable, reinforcing the need for standardised data exchange mechanisms.

4. Coordination between transmission and distribution

As most new BESS capacity is expected to connect to distribution networks, it is increasingly important that wholesale market arrangements recognise:

- local network limitations,
- protection settings,

- real-time operating envelopes, and
- distribution-level security considerations.

This reinforces the need for structured information flows and operational protocols between BESS operators, distributors, and the system operator. Experience from the Flextalk trials shows that consistent communication and data models across system actors materially improve coordination in practice and reduce operational friction—findings directly relevant to BESS integration.

5. Alignment with wider technical and standards work

EEA encourages the Authority to maintain close alignment with:

- the Streamlining Connections Technical Guidelines,
- ongoing DER/BESS interoperability and standards work,
- the Visibility and Monitoring programme,
- EECA's demand flexibility specifications, and
- frequency keeping (MFK) reform.

This will ensure participants face a coherent and technically consistent set of expectations across the system.

The EEA also highlights the growing importance of common and consistent criteria for interoperability and communication protocols—particularly for controllable devices such as BESS. Through the Flextalk 2.0 demand flexibility project, the EEA, EECA, and participating distributors have gained practical experience in coordinating multiple DER assets across different platforms and vendors. A key insight is that consistent protocols, data structures, and operational interfaces materially improve the reliability of control signals and reduce integration costs. These learnings reinforce the need for the Authority's BESS arrangements to align with emerging national work on interoperability, device communication standards, and API frameworks.

Response to Consultation Questions

Q1. Have we sufficiently identified the unique characteristics of BESS?

Yes. The paper correctly identifies the key operational characteristics that distinguish BESS from traditional generation and load. These characteristics accurately reflect how BESS behave in real operational settings. EEA adds that OEM warranty limits and distribution network hosting conditions will further shape how BESS can operate in practice, and these should be recognised to ensure expectations remain realistic.

Q2. Views on how BESS should be defined in the Code?

The EEA supports a standalone definition of BESS, as this provides clarity for Code application and helps prevent ambiguity in future rule changes. A dedicated definition also makes it easier to ensure consistency across different parts of the Code as BESS participation expands. Including the dual capability to absorb and inject energy will help avoid interpretive issues as more hybrid or co-located assets emerge.

Q3. Do you agree BESS can deliver the benefits described?

Yes. The benefits outlined are technically accurate and reflect the way BESS can support system flexibility and resilience. In practice, the extent to which these benefits are realised will depend on the reliability of dispatch responses and the maturity of operational information sharing. This reinforces the need for strong visibility and telemetry requirements as BESS participation grows.

Q4. Do you agree with the description of how BESS operation may evolve?

Broadly, yes. The shift toward increased ancillary services participation is a reasonable projection over time. However, the timing will depend on further development of both commercial incentives and system operator tools. It is important to acknowledge that some BESS may continue to focus on site-specific or distribution-level roles, which means their participation in the wholesale market may not always follow the theoretical pathway described.

Q5. Additional insights for assessing benefits?

The EEA notes that localised clustering of BESS on distribution networks may create new operational challenges, which should be considered alongside system-level benefits. The growing interaction between BESS and CER/flexible demand systems also means benefits may not be isolated to the wholesale market. Recognising these integration effects will support more realistic assessments of BESS value and risk.

Issue 1: Dispatch requirements

Q6. Do you agree with the framing of issues?

Yes. The paper appropriately identifies the security risks arising when BESS are not dispatchable while charging. These risks become more material as BESS penetration increases. EEA notes that unresolved

coordination processes between transmission and distribution system operators may intensify these risks if dispatch instructions do not account for local constraints.

Q7. Do you support the preferred option (requiring BESS to follow dispatch while charging)?

Yes, the EEA agrees in principle. Ensuring that BESS follow dispatch in both charging and discharging modes reflects their technical capability and supports more predictable system operation. However, the effectiveness of this requirement depends on ensuring BESS operators have a clear and transparent path for raising conflicts with distribution-level operating limits. Without this, compliance may be technically infeasible in some scenarios.

Evidence from the Flextalk flexibility trials also indicates that clearly defined communication and interoperability frameworks significantly improve an asset's ability to follow coordinated dispatch signals across both charging and discharging modes.

Issue 2: Bid/offer forms

Q8. Do you agree with the framing of issues?

Yes. The current separation of load and generation bids leads to avoidable complexity and occasionally unachievable dispatch outcomes. This framing accurately reflects the operational issues we observe in practice. Addressing these inconsistencies will help reduce risk and simplify participation requirements for operators.

Q9. Support for bi-directional offers and a single reserve offer form?

EEA supports this approach. A single bi-directional offer form better aligns with how BESS operate physically and reduces unnecessary duplication in market interactions. Clarifying reserve offer structures will also support more streamlined operational processes. We emphasise that enabling full implementation should be contingent on ensuring MFK systems can safely recognise and manage bi-directional flexibility.

Q10. Would MFK restrictions impact participation?

Yes. If the current limitations in MFK software remain, BESS participation will be inherently constrained regardless of market rule changes. Addressing these limitations is essential to unlocking the full ancillary

services potential of BESS. Without this capability uplift, operators may not be able to respond reliably to frequency-keeping instructions.

Issue 3: Gate closure and state-of-charge constraints

Q11. Support for aligning gate closure for distribution- and grid-connected BESS?

Yes. A consistent approach removes unnecessary incentives for connection location decisions and creates a clearer operational framework for participants. This also simplifies coordination between the system operator and distribution networks, which will become increasingly important as BESS deployment accelerates.

Q12. Support for aligning gate closure across charging and discharging?

Yes. The operational characteristics of BESS are the same regardless of mode, so alignment is logical. This reduces confusion for operators and improves the reliability of the information the system operator receives. Consistency here will also support more accurate forecasting.

Q13. Support for allowing full-capacity trading with state-of-charge constraints

The EEA supports the direction but emphasises that success depends on accurate and reliable SoC telemetry. If SoC data is not sufficiently precise, dispatch outcomes could become infeasible or unsafe. It will therefore be important to establish clear performance thresholds and validation processes before enabling full reliance on SoC-constrained dispatch.

Lessons from the Flextalk programme highlight that high-quality telemetry, structured communications pathways, and consistent data standards are essential prerequisites for accurate centralised optimisation, and these apply directly to SoC-driven dispatch decisions.

Q14. Risks or alternatives

Key risks include inadvertent over-dispatch due to inaccurate SoC, misalignment with OEM limits, and potential conflicts with local distribution constraints. These risks warrant a cautious implementation pathway. Transitional measures, for example, conservative SoC buffers or reduced utilisation factors, may help mitigate risks until systems and data quality mature.

Issue 4: Constrained-off payments

Q15. Do you support removing constrained-off payments when BESS is charging?

From an engineering perspective, this approach is reasonable so long as treatment remains consistent across comparable assets. The key consideration is ensuring that operators do not face incentives that lead to behaviour inconsistent with system security needs. EEA does not comment on commercial implications but notes that operational neutrality remains important.

Contact

The EEA's contact person for this submission is Dr Stuart Johnston, Lead Advisor Engineering & Technical (stuart@eea.co.nz or 021 11986535).