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From: Electricity Engineers' Association of NZ

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Subject: EEA Submission – Consultation Paper – *The future operation of New Zealand's power system*

OVERVIEW

The Electricity Engineers' Association (EEA) welcomes the opportunity to respond to the Authority's consultation on the *future operation of New Zealand's power system.* The EEA supports the Authority's investigation into the Future System Operation and the respective DSO Models as defined in the consultation paper. We agree with the Authority's description of the DSO role and its three core functional groups—real-time network operations, distribution market mechanisms, and integrated distribution planning—which are broadly consistent with established international definitions (AEMO and Ofgem). This provides a sound foundation for the conversation about New Zealand's future distribution system operation.

EEA members, who include network businesses, technology providers, engineers, and sector experts, have a strong interest in ensuring that the future operating model is effective, proportionate, and capable of delivering reliable, affordable, and sustainable outcomes for consumers.

Whilst we welcome that this work is being progressed, we consider that the priority should be clarifying operational functions and consumer considerations before assigning roles. The EEA encourages the Authority to deepen its analysis of existing EDB functions and consumer requirements before determining what additional structures may be needed. This is particularly important given New Zealand's unique network topology, rural context, and smaller market scale. Overseas DSO models can provide useful insights but may not fully reflect these conditions if adopted wholesale.

EEA Principles

In assessing future system operation arrangements, the EEA has identified the following principles as critical to guiding design choices:

- Neutrality and fairness – governance and market-facing functions must be delivered in a way that ensures confidence, transparency, and equal treatment of participants.

- Efficiency and proportionality – arrangements should minimise duplication, allocate functions to those best placed to perform them, and ensure costs are proportionate to consumer benefit.
- Interoperability and standardisation – consistent product definitions, data exchange standards, and coordination protocols are essential to enable effective national and local operation.
- Consumer benefit and trust – the framework must deliver value for consumers, enabling participation while protecting rights, privacy, and equity of access.
- Resilience and reliability – system operation must maintain security of supply across all levels of the grid as it becomes more dynamic and decentralised.
- Adaptability and evolution – the model should evolve over time as markets, technology, and consumer behaviours mature, rather than locking in arrangements prematurely.

Key Considerations

In preparing this submission, the EEA has drawn on:

- International experience in the UK and Australia, where different DSO models are being tested, each with strengths and challenges that are relevant to New Zealand's smaller and more decentralised context.
- Research and collaborative work undertaken in New Zealand by the ENA, the Network Evolution Group (NEG), and the System Innovation and Development Group (SIDG), which provides a valuable foundation for understanding emerging DSO functions and the capability required to perform them.
- The professional experience of EEAs Lead Advisor, Engineering & Technical, having worked directly with the Australian Energy Market Operator (AEMO) and Energy Networks Australia (ENA) on system operation and DSO transition issues. That experience highlighted both the importance of neutrality and coordination in emerging flexibility markets and the practical challenges of aligning multiple distributors, consumer interests, and technology providers. These lessons are highly relevant to New Zealand, where we face similar challenges but on a smaller scale.
- Our industry engagement in New Zealand, through workshops, forums, and technical working groups, which highlight the practical challenges faced by distributors and system operators in adapting to a more dynamic and decentralised future.

EEA's Position

From the EEA's perspective, the key considerations for determining the future of system operation are:

1. **Sequencing of decisions:** Functions should be clearly mapped for New Zealand, followed by establishing data and standards guardrails, then coordinated trials, and only then a quantified cost–benefit analysis before locking in structural changes.
2. **Hybrid as a spectrum:** The Hybrid Model is the most proportionate and future-proof approach for New Zealand. It should be treated as an evolving spectrum, with functions shifting over time as sector capability and consumer participation mature.
3. **Consumer and community engagement:** Consumer engagement and enabling participation should be the first priority. Without trust, neutrality, and clear value, flexibility markets will not achieve their potential.
4. **Neutrality and interoperability:** Independence in market facilitation and robust data/standards frameworks are essential to safeguard consumer trust and ensure a level playing field across distributors.
5. **Dispatch of generation:** Before settling the allocation of DSO functions, the Authority should first consider how existing centralised generation and large-scale embedded generation (10 MW and above) connected to distribution networks should be dispatched as more renewable generation enters the market.

The Authority's consultation sets an important direction for the sector. We support the Authority's direction in exploring future system operation and the range of DSO models. Our assessment, consistent across Questions 7–11, is that the Hybrid Model provides the most appropriate pathway for New Zealand. It balances national consistency with local responsiveness and enables an incremental, proportionate approach. However, its success depends on clear functional allocation, sequencing of reforms, consumer-centric engagement, and strong interoperability frameworks. The Authority should avoid premature structural decisions and instead prioritise function mapping, standards, and consumer value as the basis for reform.

The following section sets out our detailed responses to the consultation questions

Response to Specific Consultation Questions

Q1: Do you agree with the above explanation of the distribution system operator (DSO) role/entity, and the explanation of the distribution system operation (DSO) functions that one or more DSO entities would be required to perform?

Yes. The EEA agrees with the Authority's description of the DSO role and the three core function groups; 1) real-time network operations, 2) distribution market mechanisms, and 3) integrated distribution planning – as broadly consistent with established international definitions (e.g. AEMO, Ofgem). The DSO role is critical to the future operation of the system, and its functions must be defined with clarity. At the distribution level, operations should encompass congestion management, visibility of DER, and support for dynamic operating envelopes, underpinned by strong neutrality safeguards and interoperability standards. Importantly, there is also a need to commit to a phased uplift of DER data visibility (including LV), recognising the limitations of the current Registry for modern DER telemetry and control, and establishing a no-regrets roadmap for data standards, access, and responsibilities.

We recommend the following clarifications and additions to strengthen the definition and ensure the role is implementable and delivers durable consumer benefits:

1. Clarity within each function group
    - **Real-time network operations:** Explicitly include congestion management tools such as dynamic operating envelopes (DOEs) and clear, tested TSO–DSO operational protocols, including for emergency operations and frequency/security interactions.
    - **Distribution market mechanisms:** Highlight the requirement for standardised flexibility products, transparent procurement processes, and clear primacy rules between wholesale and distribution system needs to avoid conflicting dispatch signals.
    - **Integrated planning:** Emphasise whole-of-system alignment between TSO and DSO planning, consistent scenario assumptions, and regular publication of hosting capacity information.
2. Cross-cutting enablers
    - **Data and interoperability:** Embed compliance with device and communications standards, secure data sharing protocols, and common telemetry requirements to ensure scalable orchestration of DER across networks.
    - **Neutrality and conflict management:** Acknowledge the potential for conflicts of interest where distributors perform DSO functions while also participating in flexibility markets and signal the need for ring-fencing or other measures to maintain competitive neutrality.
    - **Consumer outcomes and participation:** Highlight the need for simple participation pathways, consumer protections, and fair allocation of network capacity for DER through transparent mechanisms such as DOEs.

3. Capability and maturity pathway

- Recognise that DSOs will require staged capability development (e.g., telemetry, analytics, DERMS/flexibility management systems, operational staffing) to ensure consistent functionality across networks of differing sizes and resource bases.

In summary, the EEA supports the Authority's proposed explanation of the DSO role and functions. Strengthening the definition with explicit references to DOEs, product and protocol standardisation, interoperability and neutrality requirements, and a staged capability pathway will help ensure that DSO arrangements are technically robust, competitively neutral, and deliver enduring consumer value.

Q2: Do you think we are correct that the themes we identified in submissions to the initial consultation paper mean we should focus mostly on system operation at the distribution level, and on the new functions required for effective distribution system operation?

Yes. The focus of reform should be on building distribution-level operating capability, including congestion management, visibility of DER, and the use of dynamic operating envelopes (DOEs). DOEs are a key tool, but they should not be applied as a one-size-fits-all default; flexibility is needed to avoid stifling innovation or mis-pricing LV constraints. Coordination must also extend to data responsibilities, common load management protocols, and agreed emergency use-cases. These measures will underpin effective TSO–DSO coordination and ensure the system evolves in a way that reflects New Zealand's unique distribution conditions.

The EEA agrees that the Authority's identified themes—(a) consumer behaviour and participation, (b) the need for greater coordination, and (c) clarity on future DSO capabilities—strongly support this focus. Our reasoning is as follows:

1. Distribution networks are the front line of the energy transition

- The rapid growth of DER and CER is concentrating operational complexity at the distribution level.
- Challenges such as congestion, voltage stability, and hosting capacity now require active, real-time management and new coordination functions between the TSO, DSOs, aggregators, and retailers.

2. Distribution-level orchestration unlocks consumer and system value

- Consumers will only realise the full value of DER investments if there is a framework that enables safe, reliable, and flexible operation locally.
- Tools such as DOEs, local flexibility markets, and congestion management are best developed where visibility is greatest, within the distribution network.

3. International practice reinforces this direction
    - In the UK, Ofgem's DSO reforms emphasise empowering distribution businesses with new operational capabilities while coordinating with the national system operator.
    - In Australia, state-level trials and AEMO protocols highlight the distribution interface as critical for integrating DER, with the TSO retaining whole-of-system optimisation.
4. A staged, capability-based approach is required
    - While distribution-level focus is correct, the pathway must recognise varying readiness levels across New Zealand's 29 distributors.
    - A national DSO capability framework, supported by consistent technical standards, interoperability protocols, and common data visibility requirements, will allow all distributors to build functions progressively, avoiding fragmentation or inequity.

In summary, the EEA supports the Authority's focus on distribution-level system operation and new DSO functions. This is the most immediate and impactful area for reform to improve reliability, flexibility, and consumer value. To succeed, however, it must be implemented through a clear roadmap, common technical requirements, and strong TSO–DSO coordination to deliver whole-of-system outcomes.

Q3: Do you think we have accurately covered the main changes to the distribution system in this section? If not, what have we missed or where have we gone wrong?

Broadly yes. The EEA considers that the Authority has captured most of the major changes affecting distribution systems, particularly the increasing penetration of DER, the growing need for demand-side flexibility, and the operational challenges of congestion, voltage management, and coordination with the TSO. The discussion on passive versus active DER, consumer engagement, and the emergence of flexibility markets reflects the key drivers we are seeing across the sector.

However, we recommend several enhancements for the Authority to consider to ensure the picture is complete and the implementation pathway is well-informed:

1. Explicit recognition of LV challenges
    - LV congestion, voltage issues, and passive DER clustering should be acknowledged as priority risks. These are now pressing challenges for distributors and require consistent, standardised visibility thresholds and coordination triggers across EDBs.
2. Interoperability and standards
    - While device standards and communication protocols are referenced elsewhere, they are fundamental to enabling scalable, safe, and reliable distribution system operation. The changes section should explicitly highlight the urgency of adopting and enforcing common inverter

standards, DER communication protocols (e.g. IEEE 2030.5, IEC 61850), and data exchange formats to avoid fragmentation.

3. Visibility and data exchange
    - Beyond recognising the need for greater visibility, the section should highlight the importance of bi-directional data flows between DSOs, the TSO, aggregators, and retailers. This is critical for coordinated congestion management and whole-of-system optimisation, especially when DER is exposed to multiple market signals.
4. Workforce capability and organisational readiness
    - Transitioning to active distribution system operation is not just a technology challenge. It requires upskilling operational teams, developing new planning and control functions, and building processes to manage flexibility procurement. The section should acknowledge this capability and workforce development dimension, particularly for smaller distributors.
5. Equity and consumer access
    - Equity considerations deserve stronger emphasis. DSOs have a role in ensuring that low-income or technology-constrained consumers are not disadvantaged as the system becomes more decentralised and market-driven, and that access to flexibility benefits is fair and inclusive.
6. Learning from international practice
    - Lessons from the UK and Australia highlight the value of early trials, regulatory sandboxes, and staged capability requirements at the distribution level. These approaches are vital to managing risk and building readiness and could be signposted here to reinforce the need for an incremental approach in New Zealand.

In summary, the EEA agrees that the Authority has identified the key trends and drivers of change in distribution system operation. We recommend the Authority considers strengthening the section by explicitly recognising LV congestion and DER clustering risks, embedding interoperability and bi-directional data requirements, addressing workforce and equity considerations, and drawing on international lessons. These additions should provide a more complete picture of the changes underway and better guide the development of effective DSO functions in New Zealand.

Q4: Do you agree with how we have defined the problem, as the need for a more coordinated framework of integrated system operation?

Yes. The EEA agrees that the central problem is the absence of a sufficiently coordinated framework for integrated system operation, particularly at the distribution level. Without greater clarity, coordination, and capability development, New Zealand risks fragmented approaches that could slow DER uptake, increase costs, and compromise reliability. Coordination between the TSO, DSOs, aggregators, retailers,

and consumers is essential, with clear protocols to ensure alignment of technical standards and market design while keeping consumers at the centre.

In the near term, however, we consider that Code changes should focus on establishing guardrails, covering primacy, interoperability, and emergency/LMP coordination, while leveraging existing IRIS/INTSA incentives, rather than prematurely fixing institutional boundaries. This approach will ensure effective coordination while preserving the flexibility needed for the system to evolve.

The EEA supports the Authority's framing and offers the following refinements:

1. Coordination at multiple levels
    - Coordination must extend not only between the TSO and DSOs but also across DSOs, aggregators, retailers, and consumers.
    - International experience (e.g. UK and Australia) shows that whole-of-system frameworks are essential to ensure market and operational signals are consistent and non-conflicting.
2. Integration of technical and market dimensions
    - A coordinated framework must go beyond operational protocols to also encompass market design, product standardisation, and flexibility procurement arrangements.
    - Clear primacy rules are vital: uncertainty over whether wholesale or distribution-level dispatch instructions take precedence risks inefficiency and undermines DER confidence.
3. Regulatory certainty to unlock investment
    - Distributors and aggregators need assurance that investments in DSO functions, systems, and workforce capability will not be stranded or conflicted by future structural reforms.
    - A well-defined coordination framework provides the stability needed to invest in DER visibility, DERMS, and flexibility platforms.
4. Consumer outcomes as the guiding focus
    - The problem should also be framed in terms of consumer impacts: without integrated coordination, consumers will face higher barriers to DER participation, reduced access to flexibility value, and higher costs from inefficient system investment.
5. Interoperability and neutrality as foundations
    - Interoperability standards and neutrality provisions must be embedded from the outset. These are not ancillary issues but fundamental to ensuring trust, contestability, and efficient scaling of distributed flexibility.

In summary, the EEA agrees with the Authority's definition of the problem as the need for a more coordinated framework of integrated system operation. We recommend that the Authority considers refining the framing to emphasise multi-level coordination, integration of market and technical functions, regulatory certainty to unlock investment, consumer outcomes, and foundational

commitments to interoperability and neutrality. Taken together, these refinements will help ensure that the framework delivers both whole-of-system efficiency and enduring consumer value.

Q5. In your view, what aspects of the Australian and British deliberations around DSO models are relevant to New Zealand?

International experience from the UK and Australia provides valuable lessons for New Zealand, particularly around staged transitions, neutrality, integrated planning, and the role of standards and pilots. At the same time, reforms must be tailored to New Zealand's unique conditions, high smart-meter penetration, smaller system scale, and diverse EDB ownership structures. Incentive-based approaches (such as INTSA) and a learning-by-doing pathway are especially relevant in our context.

Key lessons from the UK

- **Clarity of roles and staged transition –** Ofgem's approach has emphasised a clear separation between the national ESO and evolving DSOs, with distribution businesses progressively acquiring new functions under the RIIO price control framework. This staged transition has allowed capability to be built incrementally without undermining whole-of-system coordination.
- **Neutrality and ring-fencing –** Strong emphasis has been placed on DSOs acting as neutral market facilitators, recognising the risks where distribution companies both operate networks and compete in flexibility markets.
- **Integrated planning –** Regional Energy Strategic Plans (RESPs), aligned with national planning processes, ensure that distribution-level decisions support whole-of-system outcomes. This approach is highly relevant to New Zealand, where coordination across 29 distributors and the system operator is essential.

Key lessons from Australia

- **Interoperability and standards –** Initiatives led by AEMO, AER, and ARENA have shown that common inverter standards, interoperability protocols, and flexible export arrangements are essential foundations for scalable DSO operation.
- **Pilots and market trials –** Projects such as Project EDGE demonstrate the importance of trialling operational models, data exchange protocols, and market products before embedding them in regulation. These pilots have helped expose coordination challenges between AEMO, distributors, and aggregators—insights directly applicable to New Zealand.
- **TSO–DSO coordination protocols –** Australia's work on defining roles and responsibilities for DER dispatch, particularly in security-constrained environments, underscores the importance

of clear operational protocols to prevent conflicting instructions between transmission and distribution levels.

Implications for New Zealand

- A staged, capability-based transition is needed, avoiding the risks of imposing a fully-fledged DSO model prematurely.
- Neutrality safeguards, including ring-fencing, must be embedded to ensure distributors performing DSO functions do so on an even-handed basis.
- Interoperability and standards should be prioritised early, aligning regulatory settings and industry adoption.
- Pilots and regulatory sandboxes should be used to test operational and market arrangements, reducing risk before wider roll-out.
- Whole-of-system planning must be embedded, drawing on the UK's example to align distribution and transmission decisions.

In summary, the most relevant lessons from Australia and the UK are the value of staged capability development, neutrality and conflict management, interoperability standards, piloting before codification, and integrated whole-of-system planning. Incorporating these elements would allow New Zealand to design DSO arrangements that are efficient, scalable, and tailored to our market size, while ensuring enduring consumer benefits.

Q6: What do you think about the direction of research conducted in New Zealand by bodies such as the ENA, NEG and SIDG on the challenges of preparing to perform DSO functions?

The EEA acknowledges and supports the work undertaken by the ENA, the Network Engineering Group (NEG), and the System Integration Development Group (SIDG) on DSO readiness. This research has been valuable in building a technical foundation for New Zealand's transition and is broadly aligned with international developments. We particularly support the focus on function-mapping over role definitions at this stage, with incentives used to drive behaviour before heavy prescription is considered.

Positive aspects we support:

- Strong technical grounding – Identification of interoperability, hosting capacity, DER visibility, and dynamic operating envelopes (DOEs) as critical building blocks.
- Cross-industry collaboration – Constructive engagement across distributors, retailers, aggregators, and technology providers.

- Alignment with international practice – Consistency with UK and Australian approaches while adapting to New Zealand's scale.
- Piloting and experimentation – Early trials through FlexForum and ENA pilots demonstrate a willingness to test solutions in practice.

Areas where further focus is required:

- Consumer and market outcomes – Research must place greater emphasis on consumer participation models, aggregator access, flexibility market design, and equity of access.
- TSO–DSO operational protocols – Clear frameworks for real-time coordination, including conflict resolution between Transpower and DSOs, are still lacking.
- Governance and capability – Neutrality safeguards (e.g. ring-fencing) and workforce development need stronger attention to ensure DSOs can deliver their functions effectively and without conflicts of interest.
- Trial-to-implementation pathway – Mechanisms are needed to translate pilot learnings into enduring Code changes, regulatory frameworks, and market arrangements.

In summary, the EEA commends the ENA, NEG, and SIDG for their leadership and the solid technical base they have established. To ensure comprehensive readiness, future research should place greater emphasis on consumer outcomes, TSO–DSO protocols, governance and capability, and clear pathways from pilots into Code and regulation. Addressing these areas will help ensure New Zealand develops a robust, coordinated, and consumer-focused DSO framework.

Q7: What is your view about the need for an independent DSO (iDSO)? Should we consider an iDSO now as an option to perform all DSO functions, or a subset of functions related to market facilitation? Or can that decision wait until the market for flexibility services is more developed?

The EEA does not support establishing a full independent DSO (iDSO) at this stage. In a system the size of New Zealand's, creating a new entity to perform all DSO functions would add cost and complexity, duplicate existing capabilities, and introduce additional layers of coordination without delivering commensurate benefits. International assessments, such as Baringa's work in Australia, have indicated that iDSO models are typically the most costly and complex, largely due to duplication across transmission, distribution, and independent operator roles.

Instead, New Zealand should first strengthen TSO–DSO coordination, support distributors in developing DSO capabilities, and embed neutrality safeguards and interoperability standards. This hybrid pathway

is already emerging in practice and provides a pragmatic, cost-effective way to build capability without locking in premature structural reforms.

That said, there may be value in exploring a more limited independent role in future, focused specifically on market facilitation. The UK provides a useful precedent: while distribution businesses retain real-time DSO responsibilities, Ofgem has appointed an independent market facilitator (Elexon) to support product standardisation, value-stacking rules, and ensure neutrality across flexibility markets.

Our recommendations are therefore:

1. Do not pursue a full iDSO model now – instead prioritise hybrid arrangements between distributors and the TSO, with robust neutrality requirements.
2. Focus on foundational enablers – develop clear TSO–DSO protocols, product and data standardisation, and common interoperability standards.
3. Build capability incrementally – use pilots and trials to test operational and market arrangements before embedding structural reforms.
4. Keep the option open for a targeted independent market facilitator role - once flexibility markets are more developed, consider a neutral body (potentially led by or alongside the EA) to:
    - Define and standardise flexibility products and platforms.
    - Oversee value-stacking and primacy rules to ensure DER is treated consistently across transmission and distribution.
    - Provide impartial coordination between DSOs, aggregators, retailers, and the TSO.
    - Safeguard equitable access for smaller distributors and participants.

In summary, the EEA's view is that New Zealand should not create a full iDSO at this stage. A hybrid model, anchored by strong coordination, neutrality, and standards, is the most efficient and practical pathway for our system size. The option of an independent market facilitator should remain open, but only as a targeted, market-facing role once flexibility services are more mature and the supporting technical foundations are in place.

Q8: What do you think about the three DSO models proposed by the Authority?

The EEA welcomes the Authority's consideration of alternative models for distribution system operation. This is a pivotal decision for New Zealand's electricity system and should be guided by principles of efficiency, coordination, neutrality, and consumer trust.

Assessment of the three models

1. Total TSO Model (all DSO functions centralised with Transpower)
    - *Strengths:* Provides consistency of standards, neutrality in market facilitation, and economies of scale by leveraging Transpower's existing capability.
    - *Limitations:* Risks over-burdening the TSO, reduces responsiveness to local distribution issues, and may impose a one-size-fits-all approach that does not reflect regional diversity or consumer needs.
2. Total DSO Model (distribution businesses perform all DSO functions)
    - *Strengths:* Builds on distributor capability, enables local responsiveness, and leverages strong relationships with consumers and LV/MV networks. This aligns with UK practice, where DSOs are progressively taking on more responsibility.
    - *Limitations:* Creates risks of conflict of interest if distributors both operate networks and perform market facilitation. Without strong national coordination, the model could lead to inconsistency and fragmentation, and smaller distributors may struggle to build capability quickly.
3. Hybrid Model (functions shared between distributors and a central body)
    - *Strengths:* Offers the best balance of national consistency and local responsiveness. Neutrality-sensitive functions—such as product standardisation, market facilitation, and TSO–DSO protocols, can be managed centrally, while day-to-day operational responsibilities remain with distributors. This approach reflects international experience, with both the UK and Australia converging on hybrid pathways.
    - *Limitations:* Risks ambiguity or duplication if responsibilities are not clearly defined. Success requires well-designed governance arrangements, strong coordination mechanisms, and common standards.

EEA view

The EEA considers the Hybrid Model to be the most proportionate and future-proof option for New Zealand. It balances efficiency, neutrality, and local responsiveness, while allowing functions to shift pragmatically over time as capabilities mature. However, it is still early in the transition: the priority should be to develop functionality and consumer engagement first, ensuring tools such as DOEs, interoperability standards, data visibility, and flexibility markets are in place, before finalising the permanent allocation of roles.

In practice, the Hybrid Model should be treated as a spectrum, guided by principles and decision rules rather than a rigid structure. Functions can then be allocated or adjusted over time in response to demonstrated capability, consumer uptake, and system needs.

To succeed, the framework will require:

- Clear functional allocation principles – to avoid duplication and confusion.
- Strong neutrality safeguards – to maintain trust and fair market access.
- Consistent technical standards and interoperability – to support scalable coordination.
- Effective TSO–DSO protocols – to manage operational conflicts and preserve reliability.
- Equity and participation pathways – to ensure all consumers can access and benefit from flexibility.

In summary, the EEA supports the Hybrid Model as the best pathway for New Zealand but cautions against prematurely locking in structural boundaries. The first priority should be delivering functionality and enabling consumer participation; only then should responsibility for functions be finalised within the hybrid framework.

Q9: Do you prefer one model over the others?

The EEA considers that, of the models presented, the Hybrid Model is the most appropriate pathway for New Zealand at this stage. This preference reflects our assessment in Questions 7 and 8 and is consistent with the principles we have outlined for evaluating DSO arrangements.

The EEA prefers a refined Hybrid Model as the most appropriate pathway for New Zealand at this stage. It provides the right balance of flexibility, neutrality, and local responsiveness, while avoiding the cost and complexity of a fully centralised or fully decentralised model. Crucially, the hybrid allows functions to be allocated pragmatically and adjusted over time as capability and consumer participation mature.

We emphasise that decisions should be sequenced carefully rather than locked in prematurely. The recommended sequence is:

1. Map functions for New Zealand – clearly define what needs to be done before deciding who should do it.
2. Set guardrails – establish interoperability standards, data visibility requirements, and neutrality safeguards to ensure consistency across the sector.
3. Test through coordinated trials – use pilots and regulatory sandboxes to build capability, uncover practical challenges, and refine operational protocols.

4. Quantify costs and benefits – conduct a robust cost–benefit analysis (CBA) to inform any deeper structural changes.

In summary, the EEA supports the Hybrid Model as the best pathway for New Zealand but sees it as an evolving spectrum rather than a fixed structure. Sequencing reform in this way will ensure New Zealand develops DSO arrangements that are technically robust, proportionate to system scale, and focused on delivering enduring consumer value.

Q10: Given the hybrid model can take several forms, what do you think would be the best allocation of DSO functions between the TSO and one or more distributors as DSOs?

The EEA agrees that the Hybrid Model can take multiple forms, and that a clear allocation of functions is essential to avoid duplication, conflict, or fragmentation. The optimal allocation for New Zealand should reflect our system size, the diversity of distributors, and the capabilities of existing participants.

Best allocation of functions:

Function Category	Best Allocated To	Key Responsibilities
System security & reliability	TSO	Real-time balancing, frequency & voltage security at the transmission level; whole-of-system resilience.
Transmission–distribution coordination	TSO	Define/enforce interconnection protocols; ensure DER participation supports system security.
Market neutrality & standardisation	TSO / Independent facilitator	Develop product definitions, interoperability frameworks, and primacy/value-stacking rules.
Visibility & forecasting at transmission boundary	TSO	Ensure adequate data flows from DSOs to manage system-level reliability.
Real-time distribution operation	Distributors as DSOs	Monitor/manage LV & MV networks; congestion management; voltage control.
Connections & access	Distributors as DSOs	Integrate DER and new loads into distribution networks, using nationally consistent standards.

Flexibility procurement (local needs)	Distributors as DSOs (coordinated with TSO)	Identify & procure flexibility to address local constraints; align with TSO procurement to avoid conflicting signals.
Consumer & community engagement	Distributors as DSOs	Leverage close consumer relationships to support flexibility participation.
Flexibility markets & platforms	Shared / Independent facilitator	Ensure neutral, consistent, and scalable platforms for trading flexibility services.
Data governance & exchange standards	Shared / Independent facilitator	Oversee transparency, cybersecurity, and interoperability across DSOs and with TSO.
Learning & innovation	Shared responsibility (Authority, ENA, DSOs, TSO)	Coordinate trials, share lessons, and accelerate capability development.

EEA view:

We consider that this division of responsibilities ensures that:

- The TSO retains core system security and neutrality-sensitive functions.
- Distributors act as DSOs for local operational needs and consumer-facing activities where they have the closest visibility and relationships.
- Cross-cutting functions such as markets, data, and innovation are shared or independently facilitated to ensure neutrality, interoperability, and equity of access.

In summary, a carefully defined allocation of functions within the Hybrid Model is critical to success. The EEA supports an approach where the TSO provides system-wide security and standardisation, distributors act as DSOs for local operation and consumer engagement and shared or independent facilitation supports neutrality and interoperability. This structure provides the flexibility to evolve over time while ensuring whole-of-system coordination and enduring consumer benefits.

Q11: How would you rank the DSO models in terms of enabling the process of price discovery in the market for flexibility services to approach the wholesale market ideal of security-constrained economic dispatch?

The EEA considers that while all three models could, in principle, support more efficient price discovery in flexibility markets, their ability to approximate the wholesale market ideal of security-constrained economic dispatch (SCED) varies significantly.

Our ranking is:

1. Hybrid Model – best placed overall, subject to refinement.
2. Total TSO Model – strong central optimisation, but limited local responsiveness.
3. Total DSO Model – rich local optimisation, but risk of fragmentation.

1. Hybrid Model – most effective balance

The hybrid approach provides the strongest combination of national consistency and local validation. Distributors can check bids against local network constraints, while a central body ensures common product definitions, interoperability standards, and transparent processes. With clear functional allocation and robust TSO–DSO coordination, this model is the most realistic pathway for New Zealand to achieve SCED-like outcomes—where prices reflect both system-wide security and local network conditions.

2. Total TSO Model – centralised efficiency, but gaps at distribution level

A fully centralised model may deliver consistency and system-wide optimisation, leveraging Transpower's existing capabilities. However, without significant enhancements in local visibility and operational data, the TSO could struggle to capture distribution-level constraints accurately. This risks inefficient dispatch, distorted price signals, and weakened consumer trust in flexibility markets.

3. Total DSO Model – local granularity, but fragmented markets

Placing all functions with distributors would ensure that DER is optimised against local constraints, supporting granular price signals. The downside is fragmentation: without nationally consistent products, market interfaces, and governance, multiple local arrangements would hinder the development of a coherent national flexibility market and reduce the ability to achieve SCED-like coordination across the system.

Additional consideration

Before progressing DSO model selection, the Authority should also consider how existing centralised generation, and utility-scale embedded generation (≥10 MW) connected to distribution networks will be dispatched as more renewable generation enters the market. Clear arrangements for these larger assets are essential to avoid conflicting signals, ensure efficient dispatch, and create a level playing field between transmission- and distribution-connected generation.

EEA view

The EEA therefore ranks the models as: (1) Hybrid, (2) Total TSO, (3) Total DSO. We stress, however, that no model will reliably approximate SCED without critical enablers, including:

- Nationally consistent product and market standards
- Clear primacy and coordination rules between transmission and distribution
- Interoperable data exchange frameworks; and
- Explicit dispatch arrangements for utility-scale embedded generation (≥10 MW).

With these foundations in place, the hybrid model provides the most proportionate and future-proof pathway for New Zealand to achieve efficient, transparent price discovery in flexibility markets.

Contact

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