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A roadmap for the future of distribution system operation in New Zealand – Vector feedback

Overall support for the roadmap and its approach

1. Vector welcomes the Electricity Authority Te Mana Hiko's (Authority's) publication, on 30 June 2026, of its draft roadmap for the future of distribution system operation (the roadmap), and the opportunity to provide feedback ahead of 31 July 2026.
2. Vector strongly supports the Authority's decision to establish a cross-agency roadmap for the development of distribution system operator (DSO) functions and capabilities. We agree that the transition to a more decentralised electricity system will require greater visibility of distribution networks, improved coordination of distributed energy resources (DER) and consumer energy resources (CER), better interoperability, and clearer roles and responsibilities across the electricity sector.
3. We also support the Authority's intention to keep the future DSO model open at this stage. In our view, the immediate priority should be to develop the capabilities required to operate an increasingly decentralised distribution system effectively, rather than prematurely determining the final institutional model through which those capabilities will be delivered.
4. Much of the roadmap's direction is also closely aligned with the position Vector set out in our 24 March 2026 response to the joint agency letter on non-network solutions (our NNS response), and with the live evidence we will be generating through our Auckland multi-retailer low-voltage demand flexibility pilot. The observations below are intended to help the Authority carry that direction through as the work programme develops.

DSO capability is broader than the development of flexibility markets

5. We support the Authority's identification of improved visibility and signalling of distribution network constraints as the first element of the critical path (paragraphs 3.44–3.51).
6. However, we consider it important to distinguish between developing *DSO capabilities* and developing *flexibility markets*. A DSO's role should encompass the broader functions required to plan, operate and optimise a distribution network in a system with increasingly significant two-way flows and distributed resources.

7. This includes the ability to:
- a) enable flexible connections as an alternative to firm capacity where appropriate;
 - b) forecast the impact of changing demand and DER adoption;
 - c) monitor and understand network conditions and constraints at an appropriate level of granularity;
 - d) publish network headroom, constraints and the value of flexibility;
 - e) calculate and provide efficient price signals that reflect actual network headroom and allow market participants to respond;
 - f) establish operating limits (including dynamic operating envelopes where required) to maintain network security;
 - g) coordinate with retailers, aggregators and other flexibility service providers;
 - h) procure targeted flexibility where additional certainty or assurance is required; and
 - i) retain appropriate emergency intervention capabilities to protect network security.
8. We therefore encourage the Authority to ensure that the roadmap, and in particular the design and delivery of one or more DSOs under Workstream 1 (paragraphs 3.9–3.18), does not implicitly equate the development of DSO capability with the establishment of a centralised flexibility market. In our view, **flexibility markets are but one component of the future DSO architecture**, rather than the architecture itself.

Price-led flexibility should be the primary, scalable coordination mechanism, within an explicit hierarchy (paragraphs 3.19–3.25)

9. We strongly support the inclusion of the price-led versus contract-led flexibility question in the roadmap. The roadmap states that these approaches complement each other and will likely co-exist for an extended period (paragraph 3.23). We agree these mechanisms are complementary, but consider the roadmap should go further and make an explicit hierarchy between them.
10. As we set out in our NNS response, our view is that **price-responsive flexibility should be the primary and most scalable mechanism for coordinating flexible demand and DER**, with contracted flexibility used selectively where the additional certainty, availability or duration of a response has incremental value. Indeed, over time, price response may be the *only* way to coordinate millions of decentralised devices across a distribution network.
11. A well-designed distribution price signal allows retailers, aggregators and other customer agents to make their own decisions about how best to respond, and allows flexibility to develop organically as smart devices, energy management systems and customer propositions become more widespread. In contrast, relying primarily on contracted flexibility risks creating a procurement-led model in which distributors are required to identify, value and purchase flexibility that could otherwise be unlocked through efficient price signals. This would be inconsistent with New Zealand's prevailing, pricing-based market design.
12. We therefore encourage the Authority to make the following hierarchy explicit in the roadmap:

- a) prices should provide the primary, scalable coordination layer as a tool for keeping the system in balance and achieving economic investment deferral;
- b) mandatory operating limits should provide the physical safety rail;
- c) targeted flex contracts (procured via a flex market) should provide additional assurance only if and where required (i.e. when price response is ineffective or insufficient); and
- d) emergency intervention should sit at the edge of the operating framework.

This is consistent with, and was detailed at length in, our NNS response. **It is also consistent with New Zealand's long established electricity market design.**

- 13. Therefore, rather than being complementary or substitutable, the roadmap should prioritise the ongoing development and refinement by distributors of their pricing to be the core DSO tool they have for orchestration, going forward.
- 14. It is also important that contracted flex payments reflect only the **incremental** value of behavioural certainty, availability and duration beyond the flexibility already incentivised through prevailing price signals. We recommend the Authority make this an explicit expectation within its forthcoming standardisation of flexibility product definitions and trading arrangements (paragraphs 3.57–3.62), to avoid double compensation and preserve the integrity of price-led coordination.

The roadmap should focus on creating the conditions for flexibility to grow organically

- 15. We agree that flexibility is an important enabler of the future electricity system. However, our experience suggests that the immediate challenge is not simply to create a market in which flexibility can be procured. It is to create the conditions in which flexible capability itself becomes **abundant, low-cost and scalable**.
- 16. In many residential and small commercial settings, flexibility is not currently available at low incremental cost. Retrofitting controllability or smart technology specifically to provide a flexibility service – especially if it requires a site visit – can quickly undermine the economics of that service.
- 17. The most scalable approach is therefore likely to be the **organic growth of smart capability** through normal technology adoption and replacement, supported by standardisation of communication protocols, interoperability requirements, appropriate smart-device and inverter standards, access to relevant data, clear and durable price signals, and regulatory settings that do not unnecessarily restrict innovation.
- 18. We encourage the Authority to consider this an explicit objective of the roadmap. The question should not simply be how the Authority and distributors procure the flexibility they need; it should also be how the sector creates the conditions in which flexibility becomes sufficiently widespread and low-cost that the market can rely primarily on price-responsive behaviour. This is likely to produce a more efficient and sustainable flexibility ecosystem over time.

Visibility and signalling should be treated as core DSO capabilities (paragraphs 3.44–3.56)

19. We strongly support the roadmap's emphasis on improving visibility of distribution networks and signalling constraints. We encourage the Authority to view this not solely as an enabler of flexibility markets, but as a core DSO operational capability.
20. A future DSO will need to make increasingly sophisticated information available to market participants, including where constraints exist or are emerging, when they are likely to occur, their magnitude and duration, available network headroom, the value (or price) of additional import or export flexibility, and the operating limits within which DER can safely operate. This information should enable a range of responses, including price-responsive behaviour, flexible connections, dynamic operating envelopes, customer-led optimisation and, where appropriate, contracted flexibility.
21. We therefore support the Authority's proposed work on network visibility and signalling, but encourage it to consider network headroom, operating limits and SRMC-based pricing as fundamental DSO products in their own right, rather than simply inputs to a future flexibility market.

Standardise the interfaces, not necessarily the flexibility products themselves (paragraphs 3.52–3.62)

22. We support the Authority's focus on standardisation and interoperability, including the stated objective of capability-based interoperability rather than prescribing a particular protocol (paragraphs 3.52–3.56). However, we would distinguish between standardising the interfaces required to participate and the mechanisms used (e.g. prices as the scalable orchestration mechanism and contracted flexibility for assurance), and standardising the commercial products that participants must provide.
23. There is a strong case for standardising data formats, communications protocols, device interoperability, measurement and verification, cyber security requirements, and other core technical requirements for participation. However, premature standardisation of flexibility products themselves (paragraphs 3.57–3.62) could constrain innovation and result in products being designed around today's technologies and market structures, rather than tomorrow's.
24. We therefore encourage the Authority to focus first on standardising the plumbing that enables participation, while allowing flexibility products and commercial models to evolve as the market develops. This is consistent with our own architecture, which is deliberately agnostic as to where optimisation of CER occurs, and by whom, and supports both retailer-managed orchestration (device management as a service) and consumer-level optimisation through home energy management systems.

Flexible connections should be recognised as a core DSO tool (paragraphs 3.73–3.74)

25. We welcome the roadmap's recognition of flexible connections as a very important source of flexibility in the short term (paragraph 3.73), and consider flexible connections to be an important part of the DSO toolkit, providing customers with greater choice while potentially avoiding the need for unnecessarily conservative requests for firm capacity.

26. Customers do not always know what their future capacity requirements will be, and requiring every customer to seek firm, around-the-clock capacity can result in inefficient investment and unnecessarily constrain network utilisation.
27. Flexible connections provide an alternative: customers can access additional capacity where the network has it, while accepting defined conditions or operating limits when the network is constrained. This is both a network efficiency opportunity and a customer choice benefit. We encourage the Authority to ensure that flexible connections are considered alongside price signals, operating envelopes and flexibility services as complementary components of the future DSO toolkit.
28. This is consistent with initiatives Vector has already implemented, including our Flex Connect commercial product, and our Residential DER tariff (a form of low-voltage flexible connection), and with the roadmap's recognition of hot water load control as the most important source of residential load flexibility currently available in New Zealand (paragraph 3.74), which is reflected in our Residential DER tariff.

Distribution pricing should evolve from LRM towards targeted SRMC signals (paragraphs 3.93–3.98)

29. We support the roadmap's LRM Distribution Pricing work and the Authority's intention to provide guidance on cost-reflective variable distribution pricing (paragraph 3.95). Consistent with our NNS response, Vector considers that durable, LRM-aligned pricing structures should provide the primary investment anchor for consumers and retailers at this stage in New Zealand's CER uptake journey, given retailers have consistently emphasised to us the importance of stable signals to support investment in CER, automation and retail system capability.
30. However, as the AEMC has investigated at length in its recently-concluded pricing review, durable LRM signals alone are insufficient to manage emerging localised constraints. We recommend the roadmap's future work on distribution pricing (paragraph 3.97) explicitly recognise a role for targeted, short-run marginal cost signals as an adder, applied selectively where and when local, dynamic response is needed, evolving over time as participation deepens, rather than treating more dynamic real-time distribution pricing solely as a complex possibility that is yet to be considered fully. The Authority could lean heavily on the AEMC's conclusions in this regard. The AEMC states clearly the EDBs should rely on dynamic pricing and dynamic operating envelopes for managing congestion.
31. We support the roadmap's approach to peak injection rebates and the Authority's intention to provide further guidance based on LRM (paragraph 3.92). We recommend this guidance also address how the value of exports already responding to prevailing price signals should be treated, to avoid over-compensating flexibility a customer would provide in any event, consistent with the same principle we raise above in relation to contracted flexibility.

Operational security and clear responsibilities must remain central to the DSO model

32. As the system becomes more reliant on coordinated responses from DER, we encourage the Authority to ensure the DSO framework explicitly addresses the operational risks associated with large numbers of devices responding to common signals.

33. Our own experience with time-of-use pricing, and the emerging evidence discussed in Appendix C of our NNS response of a secondary demand peak around 9pm linked to popular free-hour retail offers, illustrates that price signals can produce correlated (or “herded”) responses. As the volume of flexible DER increases, this could create new risks, including unexpected synchronisation of demand, rebound effects, and responses that interact in unforeseen ways. This is consistent with, and reinforces, the roadmap’s own observation about the risk of herding as CER respond to price signals (paragraph 3.25).
34. The future DSO framework will therefore need appropriate safeguards, including:
- a) operating limits;
 - b) coordination of responses across different flexibility providers;
 - c) visibility of aggregate DER behaviour;
 - d) emergency intervention capability;
 - e) safeguards against adverse rebound or synchronised responses; and
 - f) clear responsibilities between distributors, retailers, aggregators and the System Operator.
35. In our view, the ability to safely coordinate DER in normal conditions, and to intervene when necessary during network emergencies, is a fundamental DSO capability. They are the foundation on which market-based flexibility can safely operate.
36. On clear responsibilities specifically, we note the roadmap’s identification of a risk of parties duelling over primacy where a flexibility service provider has contracted with more than one party (paragraph 3.37), and encourage the Authority to progress clear primacy rules as a priority. The laws of physics dictate that the physical limits of the distribution network will always take priority over market participation. Similarly, the size of the “market” available to a distributor to manage a constraint on its network will be orders of magnitude smaller than the market available to the System Operator.
37. We also encourage the Authority to progress its consideration of whether flexibility service providers should be regulated as industry participants under the Code (paragraph 3.72), given the confusion that could otherwise arise for providers, and for distributors and the System Operator, in navigating relationships with parties that currently sit outside good electricity industry practice obligations.

DSO development should recognise the importance of consumer trust

38. The roadmap appropriately identifies consumer considerations as a distinct workstream (Workstream 5). We encourage the Authority to place particular emphasis on consumer trust as the scale and sophistication of DER orchestration increases.
39. The future system envisaged by the roadmap will require consumers to allow retailers, aggregators and other service providers to manage devices on their behalf, potentially in response to complex network and wholesale market conditions that consumers may not directly observe. This will require a high level of confidence that consumers remain in control of their assets, their preferences are respected, their comfort and convenience are protected, their data is secure, and the benefits of participation are fairly shared.
40. This reinforces the importance of simple consumer propositions and clear accountability, even where the underlying network and market signals are increasingly sophisticated, consistent with Vector’s approach of ensuring retailers and other energy service providers,

rather than distributors, own the customer relationship and translate that complexity into simple products.

We support the Authority's decision to keep the future DSO model open

41. We support the Authority's decision not to endorse a particular DSO model at this stage. In our view, the immediate priority should be to build the capabilities that any successful DSO model will require, and to test those capabilities through practical implementation and pilots.
42. The development of DSO capability should be an iterative process. Experience with network visibility, price signals, flexible connections, operating envelopes, flexibility services and operational coordination will provide valuable evidence about which functions are most efficiently performed by distributors, the System Operator, retailers, aggregators and other market participants. Vector's own multi-retailer, low-voltage demand flexibility pilot in Auckland, developed with EECA and several retailers, will directly generate this kind of evidence: it is testing whether calibrated locational pricing and transparent operating envelopes can reliably coordinate flexibility across competing retailers on shared low-voltage assets, before network reinforcement is required. We would welcome the opportunity to share emerging findings with the Authority as they become available.
43. We therefore support the Authority's intention to monitor progress and review the effectiveness of the emerging arrangements. However, we encourage the Authority to ensure that this monitoring is focused not only on whether flexibility markets have developed, but also on whether the broader DSO capabilities required to operate an increasingly decentralised system are being developed effectively.

Conclusion

44. Vector supports the Authority's DSO roadmap and its recognition that New Zealand's transition to a more decentralised electricity system requires new capabilities, clearer roles and greater coordination.
45. We encourage the Authority to retain a broad conception of the DSO role. In our view, the future DSO should not be defined primarily by its ability to procure flexibility; its core role is to understand and operate an increasingly complex distribution system, make network needs visible, provide efficient signals and operating limits, and enable market participants and customers to use flexibility where it creates value.
46. The most effective architecture is likely to be one in which:
 - a) prices coordinate behaviour at scale,
 - b) operating limits protect the physical network,
 - c) flexible connections provide customers with choice,
 - d) targeted contracts provide additional assurance where required, and
 - e) emergency intervention provides a final safeguard for network security – and gives the confidence for participants to increase their reliance on market-based flexibility.

We encourage the Authority to reflect this hierarchy more explicitly in the roadmap as the work programme develops.

47. We appreciate the Authority's continued engagement with the sector on this important work and would welcome the opportunity to discuss any of the points raised in this letter, including early findings from our Auckland pilot, at a time that suits.

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