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System Operator

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Submission on System Operator Strategy (initial engagement paper)

Vector welcomes the opportunity to provide feedback on Transpower's System Operator Strategy initial engagement paper. As New Zealand's largest electricity distribution business, Vector is deeply engaged in managing the operational and investment implications of rapid electrification, the accelerating uptake of distributed energy resources (DER), and rising expectations for affordability, reliability and resilience from consumers and policymakers.

Vector broadly agrees with the System Operator's articulation of the key trends shaping power system operation over the next decade. In particular, we support the recognition of increasing DER penetration, the role of DER flexing to system needs, declining system inertia, growing exposure to weather-driven variability, and the critical importance of data, digitalisation and workforce capability. These trends are already material on Vector's network and are directly influencing how we plan, price, operate and invest in infrastructure.

Vector has consistently advocated for a whole-of-system approach to planning and operation. We therefore support the paper's emphasis on improved coordination between transmission and distribution system operation. However, Vector considers it essential that this coordination is grounded in clear role definition and accountability, with electricity distribution businesses retaining primacy for overseeing and managing distribution-level constraints, emergencies and imminent risks. This includes the response of flexible DER to system-level emergencies – especially the restoration of load post-event.

In Vector's view, some elements of the paper risk overstating the readiness of the New Zealand system for advanced models of decentralised or market-led orchestration. In particular, the paper underestimates the operational complexity, safety risks and cost associated with managing large volumes of DER at the low-voltage level where multiple third parties may be controlling devices. Vector does not believe that price signals or uncontracted responses alone can be relied upon to maintain network security or to avoid quality breaches under the current regulatory framework.

Vector's strong preference remains for a hybrid model of future system operation. Under this approach, the System Operator retains responsibility for system-wide coordination, market operation and security of supply, while EDBs continue to plan, operate and actively manage their networks, including contracting and dispatching local flexibility where required, and ensuring physical and power-quality constraints are respected by DER operators irrespective of our needs. This model best reflects New Zealand's market structure, leverages local network knowledge, and avoids unnecessary duplication of capability.

Vector also reiterates the importance of sequencing and pace. Incremental, least-regrets progress on foundational enablers - including DER visibility, EDB-developed DER operating protocols (including enforceable operating envelopes), data standards, interoperable communication protocols, and - is urgent. In the absence of these building blocks, more structural reforms, such as independent DSO models or expanded centralised control, would be premature and risk imposing significant costs on consumers without commensurate benefit.

Vector's responses to the specific questions posed in the initial engagement paper are set out in Appendix A to this submission. Vector would welcome the opportunity to continue engaging with the System Operator as the strategy is refined and translated into practical work programmes.

Yours sincerely



Bas van Esch
Market Regulation

Appendix A: Responses to specific questions

Question	Vector response
1. Do you agree with the trends and drivers identified for the next ten years?	Vector generally agrees with the trends and drivers identified in the paper. Electrification, rapid DER uptake, declining system inertia, increased weather dependence, and growing cyber and data risks are already evident on distribution networks. These trends are materially changing operational practices and investment priorities for EDBs.
2. Which trends do you consider will have the biggest impact on system operation?	Vector considers the most consequential trends to be the rapid growth of DER at the low-voltage level, increasing peak demand driven by electrification of transport and heat, and declining system inertia. Together, these trends significantly increase coordination, forecasting and security challenges if not actively managed. The key will be for the System Operator to coordinate much more closely with EDBs, who will be seeing these trends manifest on the ground.
3. Are there any trends that are missing, overstated or understated?	Vector considers the paper understates the complexity and cost of safely orchestrating DER and the impact at the low-voltage level, particularly in environments where multiple retailers and non-retailer aggregators are managing devices. The risk of herded behaviour, especially if/when those devices are being managed in response to transmission system signals, and localised congestion, is material and requires explicit operational safeguards.
4. What advanced technologies and data capabilities will be most critical?	From Vector's perspective, foundational capabilities are the priority. These include near-real-time visibility of low-voltage networks, standardised data exchange between parties, secure communications, and mandatory, enforceable operating envelopes for DER. Advanced optimisation tools will only deliver value once these basics are in place.

<p>5. Where do you see power system operation being in ten years' time?</p>	<p>In ten years' time, Vector expects system operation to involve much tighter integration between transmission and distribution. EDBs will be performing more active, real-time network operation and signalling and flexibility dispatch to manage local constraints, supported by the System Operator's system-wide coordination and market functions.</p>
<p>6. What skills and capabilities will the System Operator need to develop?</p>	<p>Critical capabilities will include deep power systems engineering expertise, advanced forecasting and data analytics, cybersecurity, and human-centred control-room design. Equally important will be workforce development, retention and knowledge transfer as the system becomes more complex.</p>
<p>7. Are there areas where the System Operator could play a stronger leadership role?</p>	<p>Vector sees a valuable leadership role for the System Operator in driving alignment on national data standards, interoperability frameworks, and clear articulation of TSO–DSO interfaces. Consistent guidance in these areas would materially reduce uncertainty for EDBs and market participants.</p>
<p>8. What is one thing you would like the Strategy to address more clearly?</p>	<p>The Strategy should clearly recognise the primacy of EDBs in managing distribution-level security, including the need for mandatory obligations on all DER managers — retailer and non-retailer — to operate within network limits and comply with directions during emergencies and imminent risk events.</p>