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Submissions
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ERGANZ SUBMISSION ON THE SYSTEM OPERATOR STRATEGY

The Electricity Retailers' and Generators' Association of New Zealand ('ERGANZ') welcomes the opportunity to provide feedback on Transpower's consultation paper, 'System Operator Strategy: key trends and issues' from December 2025.

ERGANZ is the industry association representing companies that generate and sell electricity to Kiwi households and businesses. Collectively, our members supply almost 90 per cent of New Zealand's electricity. We work for a competitive, fair, and sustainable electricity market that benefits consumers.

Summary

ERGANZ supports Transpower's development of a System Operator Strategy.

New Zealand's electricity system is in a period of significant transition. Investment in new renewable generation is significant, even larger than during New Zealand's 'Think Big' period. Committed and actively pursued developments are set to increase total generation capacity by approximately 1,830 MW by 2027 and further electrification of the economy will drive sustained demand growth.

Against this backdrop, the System Operator occupies a pivotal position, it is both a critical enabler of and a potential constraint on the pace of New Zealand's electrification. This strategy development process is an important opportunity to ensure the SO is oriented toward enabling this transition.

ERGANZ's key messages in this submission are:

- The SO must become an active enabler of electrification. This means adopting an enabling culture, streamlining connection processes, and reviewing conservative operational limits that may be restricting use of existing grid capacity. With the pace and scale of intermittent generation and demand growth exceeding the pace and scale of grid investment, the SO will need to support the Grid Owner in optimising use of existing grid assets.

- Data, AI, and automation must be treated as urgent operational imperatives. The move from a linear one-way power system to a complex two-way system cannot be managed safely with existing manual tools and rules of thumb at the scale and pace electrification demands.
- RMA reform is a material omission from the consultation document. The Government's consenting reforms, including the new Fast-track regime, will significantly affect build timelines for generation, transmission, and distribution. The SO needs to explicitly consider how regulatory change affects its planning assumptions.
- The connection and commissioning process is a critical bottleneck for investment. International examples, including PJM's interconnection queue management, demonstrate that AI can dramatically accelerate connection system studies. The SO should lead a step-change improvement here.
- The SO should explicitly plan for a more distributed, harder-to-observe system. This requires new operating philosophies, including network 'self-healing', adaptive monitoring, and greater automation of control room decisions, rather than incremental improvements to current approaches.

Submission points

Electrification demands an enabling System Operator

The electricity sector is investing at a scale New Zealand has not seen in decades. ERGANZ members plan to invest an additional $6 billion in new generation projects between now and 2030, and the pipeline of non-ERGANZ member generation projects is also strong. Further electrification of New Zealand's transport, industrial process heat, and heating sectors represents a substantial long-run growth opportunity for the system as a whole.

This investment momentum is real, but it requires investor confidence in the regulatory and operational environment that does not impose unnecessary friction on new connections, commissioning processes, or grid access. The SO has both a responsibility and an opportunity to be a genuine enabler of this investment.

ERGANZ asks the SO to examine its internal processes critically: is the organisation oriented toward enabling growth, or toward managing risk conservatively? The two are not always in conflict, but when they are, the default should favour enabling the transition rather than maintaining historical margins. The SO must find ways to create capacity across the network to avoid impeding electrification progress in the near term. New Zealand cannot afford to wait decades for new infrastructure to be built.

AI and data-driven systems are becoming essential infrastructure

The consultation document's discussion of AI in section 7.4 appropriately identifies the potential of these technologies, but the framing that the SO intends to 'stay across these developments' perhaps understates the urgency. Advanced data analytics, machine learning, and digital twin capabilities can be argued as prerequisites for the safe and efficient operations in the system that is emerging now.

The transition from a synchronous, dispatchable generation fleet to a system dominated by inverter-based, intermittent resources changes the fundamental physics of system operation. Existing modelling approaches, scenario tools, and control room decision processes were designed for a different system. At scale, they will be insufficient. The SO should treat investment in AI/ML-enabled operations as a core capability investment with the same urgency as physical infrastructure.

ERGANZ recommends the SO to prioritise: AI-accelerated system studies for new connections, ML-enhanced outage planning tools that can evaluate more scenarios faster, AI-powered weather and dispatch forecasting integrated into real-time operations, and digital twin capabilities that allow operators to test contingencies before committing to operational decisions.

The connection and commissioning process is a strategic bottleneck

There is substantial capital willing and ready to invest in New Zealand's electricity sector. However, there are constraints around the time taken to progress connection applications, system studies, and commissioning approvals through the SO and Grid Owner processes. Current timelines impose real costs on investors and ultimately on consumers, by delaying the arrival of new, often lower-cost generation capacity.

ERGANZ notes that internationally, AI is being deployed precisely to address this problem. PJM, the largest grid operator in North America, is collaborating with Google and Tapestry to deploy AI tools aimed at cutting multi-year interconnection queue delays to weeks or months. The CAISO is piloting AI platforms for outage management and grid operations. The SO should actively investigate and adopt these approaches.

ERGANZ recommends that the SO commit in its strategy to specific, measurable improvements in connection process timelines, and that it report publicly on progress against those targets.

Transpower's strategy should explicitly address consenting reforms

The Government's Resource Management Act reforms, including the Fast-track consenting regime, are among the most significant regulatory changes affecting the electricity sector's near-term development pipeline. Yet, this consultation document does not explicitly address RMA reform as a trend or driver.

For generation projects, the RMA changes affect the timelines for new generation development, the feasibility and cost of large transmission projects, and the risk profile of long-lead-time investments. ERGANZ recommends the SO explicitly to model how RMA reform affects its assumptions about the generation development pipeline, the timing of new connections, and the likelihood of transmission upgrades proceeding on schedule.

We note that even with consenting reform, large transmission projects will remain challenging to deliver at pace. This reinforces the importance of the SO and Grid Owner focusing on extracting the most from existing infrastructure, using data-driven and machine learning techniques to replace

old-school rules of thumb (Latta ratings, 15-minute offload times, and similar conservative standards that may no longer reflect actual system conditions).

Will the system of 2035 require a new operating philosophy?

The consultation document appropriately identifies many of the technological changes underway. ERGANZ encourages the SO to draw out the implications more explicitly for its own operating model. A system with high penetration of distributed energy resources, inverter-based generation, and responsive load cannot be operated the same way as the system of 2015. At a sufficient scale of DER uptake, it will become impractical for the SO to have full real-time visibility of all system components. The SO should begin developing the operating frameworks, data standards, and automation tools needed for adequate system oversight now.

Similarly, the gradual automation of control room decisions, starting with well-understood, repetitive tasks and expanding as confidence grows will be essential as system complexity increases. The SO's 'Control Room of the Future' initiative is a welcome foundation and we encourage the strategy to provide clear timelines and investment commitments to give that initiative teeth.

Consultation questions

Questions	Comments
1. Do you agree with the trends and drivers identified?	Yes, broadly. The five-area PESTLE framework captures the key forces well. We particularly support the emphasis on electrification investment, declining gas supply, and the pace of technological change. We note that RMA reform is a major driver of the timeline and cost of new generation and transmission builds but this is not explicitly addressed in Chapter 3. This is an omission given the Government's Fast-track consenting regime and broader RMA reforms. The discussion of weather-related risks (Chapter 5) is appropriate but brief given the increasing incidence of climate-driven disruptions. Solar storms, while low probability, carry potential for significant system disruption and deserve specific mention.
2. Which trends will have the biggest impact?	ERGANZ believes the single biggest impact trend is the need for more effort to support new generation and load connections and commissioning (as identified on page 7 of the consultation document). This is critical to keep pace with the rate and scale of electrification. Specifically, ERGANZ encourages the SO to: • Adopt an enabling approach, collaborating with stakeholders to enable growth and development.

	• Work to remove barriers to innovation and the use of new technologies that deliver capacity sooner. The SO should be an innovator, not just a follower. • Review limits and constraints with the objective of replacing historical conservative margins with solutions that optimise grid capacity. Data and AI investment for decision-making in planning and the control room, and the management of key system events (particularly climate-driven events), also rank as important areas. The transition from a linear, one-way power system to a two-way, complex system means existing rules of thumb will be insufficient to securely manage the system within a decade.
3. What other trends or drivers should be considered?	The potential for disruptive energy technologies should be considered even if commercial viability within the ten year timeframe is unlikely. The strategy should acknowledge the possibility of step-change technologies. RMA reform as a specific trend because the pace and nature of consenting changes will materially affect the timeline for new generation, transmission, and distribution builds, and therefore the SO's operational workload and risk profile.
4. What advanced technologies will be critical?	AI, machine learning, and digital twins are essential to deliver now. Moving from a linear one-way power system to a two-way complex system means existing modelling approaches and rules of thumb will be insufficient to securely manage the system. ERGANZ considers the priority focus areas are: • AI/ML automation across all aspects of planning, security assessment, and real-time operations. • Digital twins for scenario testing and outage planning to dramatically reduce analysis timeframes. • Advanced computing techniques for system studies (connection assessments, outage planning) to replace current manual processes because stakeholders need to see faster turnaround on these analyses. • AI-enhanced weather forecasting integrated into dispatch and reserve decisions. The SO will need to embrace emerging technologies at a comparable pace to the energy sector or risk curtailing New Zealand's access to the benefits of electrification. This includes pursuing technologies that optimise the capacity and capability of the existing grid for the period between generation and demand growth arriving and grid investment delivery.
5. Where do you see system operation in ten years?	The system will be significantly more complex. The SO will face increasing challenges in maintaining full visibility of a highly distributed, two-way network.

	Key shifts the SO should plan for include a move from requiring all data to be provided to the SO, towards a model where the SO 'samples' or 'probes' key nodes to ensure stability and reliability. The SO should be moving to managing by exception rather than total visibility. In addition, much greater reliance on AI-driven decision support in the control room, with operators focused on oversight of automated systems rather than direct manual intervention.
6. What skills and capabilities will the SO need?	The SO should invest in data analytics and data science capability, with people who are dual-trained in both system operation and data-driven automation. Having operational people who can also develop data-driven tools would be a strategic strength for Transpower. The sector could collectively support this by creating clear career pathways into the sector from engineering and data science disciplines, and engaging with the tertiary sector to develop a relevant curriculum and attract new talent.
7. Where could the SO usefully take more of a leadership role?	Connection process acceleration: The SO should lead a step-change improvement in the speed of the new connection process. There is strong investor appetite across the sector, but the time taken for connections, system studies, and planning assessments is a material barrier. Applying AI and advanced computing to connection system studies could reduce multi-year delays to weeks or months, as PJM in North America is demonstrating. Data-driven grid optimisation: The SO and Grid Owner should jointly prioritise extracting the most from existing infrastructure through data-driven techniques, replacing old-school rules of thumb (Latta ratings, 15-minute offload times, etc.) with dynamically updated, evidence-based limits. New Zealand cannot afford to wait decades for new transmission infrastructure.
8. What is one thing you would like the strategy to address?	Develop data-driven processes and systems to replace existing manual modelling, rules of thumb, and conservative ratings. This will assist with getting more from existing infrastructure in the near term while simultaneously speeding up the connection and commissioning process for new investment. These two priorities are linked: unlocking existing capacity buys time, and faster connections ensures the pipeline of new investment translates into supply at the pace required to support electrification.

Conclusion

ERGANZ would like to thank Transpower for considering our submission.

If there are any outstanding questions or a need for further comments, please let me know.

Yours sincerely,

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