wellington electricity

The future operation of New Zealand's power system

19 August 2025

1 Submission and contact details

Consultation	The future operation of New Zealand's power system
Submitted to	Electricity Authority
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2 Confidential information

There is no confidential information provided in this submission. This submission can be publicly disclosed.

3 Introduction

Wellington Electricity Lines Limited (WELL) welcomes the opportunity to provide a submission on the Electricity Authority's consultation "The future operation of New Zealand's power system".

Wellington Electricity supports the Authority's focus on future system operation and agrees the central design choice is how to coordinate distributed energy resources (DER) alongside transmission-level resources. However, we note that the paper assumes a "DSO" is necessary and that it represents something fundamentally different from what is already done. The Authority needs to be clear about the purpose of a DSO - it is to ensure the safe and secure operation of the distribution network, or is it to coordinate the trading of energy. In WELL's view the coordination of energy trading is not something that sits within the fundamental scope of a distribution business i.e. it is a voluntary extension (to the extent permitted by regulation), but not fundamentally necessary. What is fundamental is an EDB ensuring appropriate connection standards are in place and that operational standards are set, monitored, and enforced in order to ensure the safe and reliable operation of the distribution network.

Of the three models outlined, a hybrid DSO model could be the best near-term fit for New Zealand, but we have concerns that the Authority is conflating the roles of a network owner and an energy market orientated DSO. Real-time operation and network planning (the first and third functions of a DSO in the paper) must remain with the network owner, in analogy with how Transpower manages and plans the grid. There is a clear separation of roles for the System Operator in managing energy dispatch, and for both transmission and distribution network owners in ensuring standards are appropriately set so networks continue to operate safely and securely.

The advent of flexibility being provided at a local level makes these roles more complex, but it doesn't change the fundamentals of "keeping the lights on" and ensuring an operational network. For example, the flexibility market could be carved off as a separate function entirely, provided standards are maintained. However, we emphasise that beyond the meter, the physical operation of users' appliances and energy sources is entirely voluntary business extension for a network owner and is likely to be facilitated by numerous different businesses operating under various business models. The Authority should recognise this distinction rather than assuming these activities fall under DSO coordination.

The Authority's own paper notes both a tentative preference for a hybrid model and that some distributors already perform DSO-like functions with the TSO, in practice. For example, network planning is a core distributor function and should be left with the asset owner in any future model (in analogy to Transpower's grid planning function).

Distribution operations extend well beyond real-time (planned outages, week-ahead coordination); the hybrid model should explicitly recognise pre-dispatch coordination windows at LV. WELL highlighted this in its 2024 Future system operation submission[1].

Hot-water control capability remains a critical security tool and should be preserved while flexibility markets grow.

4 Responses to consultation questions

Q1. Do you agree with the 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?

1 Wellington Electricity submission Future System Operation April 2024

No. While the paper frames functions (validation, coordination, local services) that could be done by a distributor (network owner) or a DSO, it is essential to differentiate between DER participation in wholesale markets (i.e. “flexibility services”) and assets that are providing line function services. An example of where this line can be blurred is voltage control on the distribution network.

Traditionally, this safety-critical function has been delivered through network assets such as tap changers, voltage regulators, capacitors, and diesel generators. This is not a wholesale market function, the operation of these legacy assets cannot be considered to be a “flexibility service”, and there is no scenario in which it would be appropriate for the market regulator to force an EDB to divest these network assets in order to facilitate the creation of a competitive market for voltage control.

Modern network technologies that can deliver a similar voltage control function include network batteries and power electronic devices such as STATCOMs. Naturally, where an EDB can procure a service from a third party that delivers voltage control to the required quality and dependability that is cost-effective relative to the installation of network assets, then they should do so. However, a competitive market is not the appropriate mechanism for delivering safety functions, and it is not the role of the market regulator to dictate what asset types can or cannot be used for this simply because in another context those types of assets could be used for wholesale market participation.

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?

The largest new function is market facilitation of flexibility services, which Future Code should focus on. However, it is essential to make a clear distinction between two categories of functions: first, the fundamental activities required to ensure networks remain operational (as without operational networks there can be no market), and second, the provision of services to the market itself. While market facilitation of flexibility services represents a significant evolution in system operation, this must be built upon and clearly delineated from the core network reliability functions that serve as the foundation for any market activity.

For reference to an existing industry parallel, the Grid has Grid standards which set behaviours for the connected participants wishing to interconnect and use the Grid. The System Operator takes these Grid standards and manages the participants within the standards settings so that the Grid remains available and in-service for the wider participants and connected customers. The DSO and EDB can be thought of in a similar manner.

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. Please add: (i) preserving existing hot-water demand management during transition, and (ii) the role of price-quality regulation and new allowances in enabling LV visibility and non-traditional solutions.

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

We note that the timescale of when the problem becomes material is likely to be longer than expected. The Authority should prioritise coordination between current participants.

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

Useful for data/standards and interfaces. NZ should first focus on visibility. Note that the Australian example of solar control is to manage export constraints and system stability, not to trade energy.

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?

Supportive; it aligns with WELL's practical experience that data access/standards. These standards are fundamental to maintaining operational networks.

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?

Using the three DSO functions in the paper: real time operations, distribution market mechanics, and integrated distribution system planning.

- Realtime operations. Separating this function off into an independent entity would result in the iDSO delivering the realtime operations function using EDB-owned network assets (e.g. circuit breakers and other switchgear, SCADA equipment, communications cables, etc). We consider this is a core component to ensure an EDB maintains the operability of a network, and managing quality and safety obligations. While it is possible to separate, as there are many examples where one party (i.e. an EDB or Transpower) has operational control of another party's assets, it is not necessarily a positive or efficient step to take. The relationships under this model would be complex, needing to cover at the minimum the parties' responsibilities

under the Health and Safety at Work Act, the Electricity Act, the Electricity (Safety) Regulations, and other legislation, and responsibility for performance against the regulatory Quality Path. Liabilities would need to be aligned for such a change to be made. Where out-of-limits events occur the iDSO would need to assume responsibility for the breach of network operating standards and subsequent dispute reconciliation and restitution for customer damage. Where outages result, this would involve iDSO accounting for Quality limits being exceeded as per Price-Quality paths of the EDB. Putting market ahead of security & reliability of supply for connected parties does not happen at the Grid level so this precedent should translate to DSO functions.

- Distribution system planning is heavily integrated with lifecycle asset management. It is inseparable from the EDB Price-Quality regime as network planning decisions directly drive the asset owner's capital and operational expenditure, the reliability performance of the network, and the ability to safely maintain the network – all fundamental aspects of the Price-Quality Path. Carving the EDB system planning function off into a separate entity would therefore be impractical under the current regulatory regime and would create significant inefficiencies, including duplication of planning capabilities, loss of integrated decision-making between asset management and network development, increased coordination costs and delays, misalignment between planning decisions and accountability for their outcomes, and fragmentation of the knowledge base needed for optimal network investment decisions. These inefficiencies would ultimately increase costs for consumers while potentially degrading both service quality and network reliability.

- That leaves the practical iDSO scope under the current regulatory regime as being the distribution market mechanics. This would be a reasonable segregation of responsibilities that separates the market from asset ownership, mirroring the operation of the transmission network. This function could be delivered either by the TSO under the Hybrid model or by a third party iDSO. There will be many players in this space, including more motivated consumers.

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

Hybrid is preferred for NZ's current state; total-TSO risks bypassing LV constraints; total-DSO is a potential end-state but unnecessary now. This is assuming that the concerns raised around physical operation earlier are addressed.

Q9. Do you prefer one model over the others?

Hybrid DSO with clear validation/priority rules and standardised data exchange. Protection of the physical network must take priority over other options.

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?

TSO: security-constrained dispatch; wholesale market operation; system-wide reliability.

Distributor as DSO: voltage/congestion management, local DER services procurement for non-network solutions, dynamic/export settings, and data provision on network constraints/capacity. Physical operation must remain with the distributor as network owner.

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?

Further scoping is required to answer this question. The specific design matters a great deal. Networks remain the physical platform on which other parties will transact and controls should be maintained such that this platform is maintained for all customers.