19 August 2025

Electricity Authority
PO Box 10041
Wellington 6143

By email to: fsr@ea.govt.nz

Dear Electricity Authority team,

Submission to the Electricity Authority (Authority) on *The future operation of New Zealand's power system consultation paper*

We thank the Authority for the opportunity make a submission on the Authority's recent consultation paper *The future operation of New Zealand's power system*.

ENA is the industry membership body that represents the 29 electricity distribution businesses (EDBs) that take power from the national grid and deliver it to homes and businesses (our members are listed in Appendix B).

EDBs employ over 7,800 people, deliver energy to more than two million homes and businesses, and have spent or invested $6.2 billion in network assets over the last five years. ENA harnesses members' collective expertise to promote safe, reliable, and affordable power for our members' customers.

Executive Summary

ENA believes that the fundamental question that the Authority is concerned with is: "If we do not regulate to enable one of the DSO models **now**, is there a risk that NZ is materially worse off than if we had done so?" We perceive this consultation as being a step along the road towards the Authority answering that key question.

With that interpretation in mind then, ENA's response to this question is that in the absence of a compelling case to regulate for one of the other DSO models presented the hybrid model is clearly preferable. It requires essentially no (or very little) regulatory intervention to enable, and it does not disrupt roles and functions of existing industry participants (merely evolves and expands them, in the case of EDBs and the TSO). Reallocation of roles and functions at this stage would be challenging as new functions are still emerging and maturing. Some learning by doing is required before models are firmed up and material decisions made on any changes to who is accountable for DSO roles and functions.

The hybrid model also has compelling strengths over the other models, as highlighted in the *Potential models for distribution system operation (DSO) in Aotearoa* report[1] (the Baringa report) – namely lower cost and shorter timescales to implement, and positive attributes with respect to

[1] https://www.ena.org.nz/our-work/news/new-report/document/1544

network stability, climate change resilience, enabling consumer choice and contributing to decarbonisation efforts.

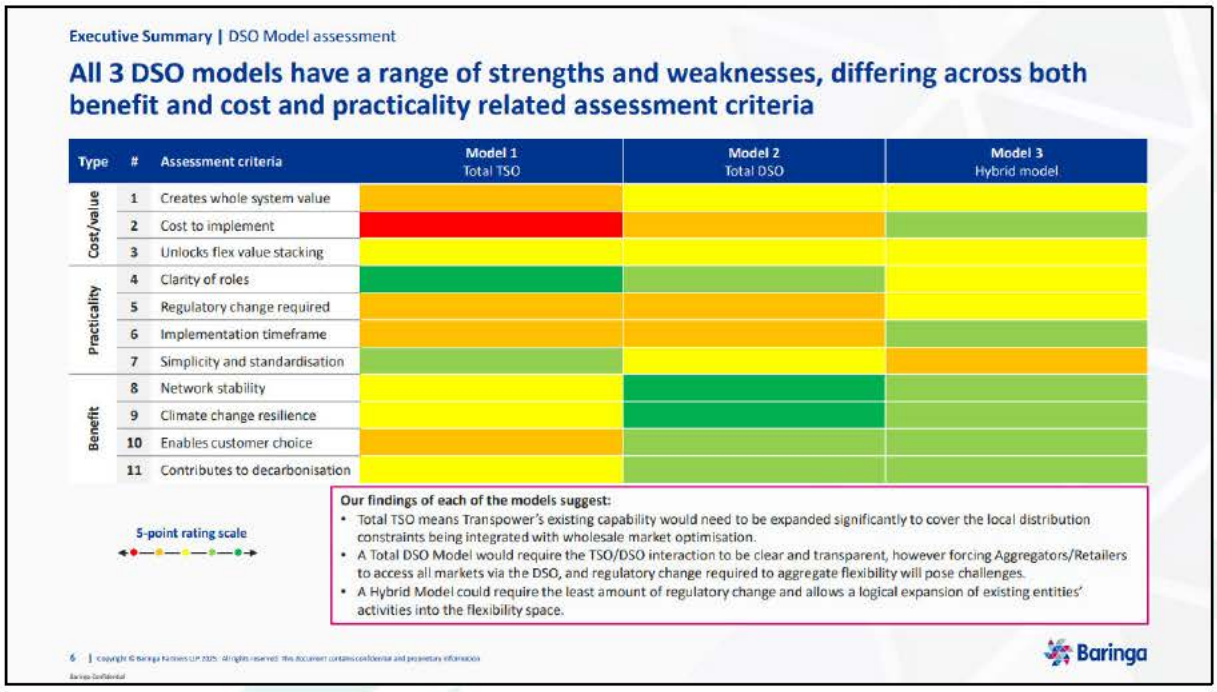

Figure 1- Potential models for distribution system operation (DSO) in Aotearoa - slide 6

ENA also considers that the hybrid model is likely to occur naturally anyway, absent some regulatory intervention – and crucially, it preserves optionality for any of the other DSO models in future, if required, without requiring significant cost or time to implement in the near to medium term.

Given the above, and in ENA's view, no immediately compelling case for the regulatory interventions necessary to support the other DSO models presented, ENA prefers and supports the hybrid model.

In terms of next steps, we understand that the Authority is considering commissioning a detailed cost-benefit analysis (CBA) of the various DSO models presented in the paper. As that is likely to be a challenging undertaking, we suggest researching whether comparable CBAs have been carried out in other jurisdictions, and if so, were they considered to have been useful in hindsight?

ENA also notes that network visibility, particularly of the low voltage network level, will be critical to distribution system operators performing many of the DSO functions. We urge the Authority to consider the current industry arrangements for accessing low voltage network data (especially via smart meters), and whether these are fit for purpose for any of the DSO models presented here.

Lastly, we encourage the Authority to consider how the voice of the end consumer can be brought into its deliberations on future system operation. We acknowledge that the subject matter is reasonably complex, but wherever possible the regulator should look to allow consumer perspectives and insights to inform its thinking on topics such as this, which will have significant long-term implications for electricity system, and by extension the well-being of New Zealanders.

Format of our response

ENA has responded to the questions in the Authority consultation document in Appendix B.

If ENA can be of any assistance in the Authority's future deliberations on this subject, then please contact Richard Le Gros, Policy and Innovation Manager [redacted]

Yours sincerely

[redacted]

Richard Le Gros

Policy and Innovation Manager

Appendix A: ENA response to consultation

1. 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?

ENA generally agrees with the Authority's explanation of the DSO roles and functions as laid out in the consultation paper. In the ENA's work to date, led by the Future Networks Forum's (FNF) 'Capabilities, Roles and Functions' project, we've focussed on defining the Capabilities, Roles and Functions (CRFs) that need to be performed by some party to enable the desired future system operation model on the distribution networks. While that project acknowledges that there are certain groups of CRFs that logically should be kept together and performed by one entity, generally it is more useful to consider how to define these CRFs first, before spending too much time trying to determine which party should perform them.

We'd also like to highlight that there are existing CRFs already performed by many EDBs that would arguably sit within the DSO roles and functions defined in the paper. For example, many EDBs have sought to procure (and will no doubt continue to do so) non-network solutions to capacity constraints on their networks.[2] In addition, many EDBs carry out the management and operation of 'traditional' hot water load control (HWLC) via ripple control as a key tool to manage not just real-time operation of the distribution network, but also tightly integrated into network planning and design.

Irrespective of where boundaries are drawn between the different parties who participate in the future operation of the power system (incl. at the distribution network level), open, secure and well-established standards to govern the transfer of information and instructions across those interfaces will be necessary – whether that be between the TSO and DSO, DSO and aggregators, or other parties. Provided these standards are well understood, open, and universally adopted, to a certain extent it doesn't matter whether different DSOs (assuming more than one) all have the same set of CRFs – the necessary information and instructions can be transferred between parties in an efficient manner, regardless. ENA sees a coordinating role for itself in supporting its members and the wider electricity sector to discuss, debate, agree and adopt the appropriate standards for those interfaces.

It goes without saying – but we'll say it anyway – that wherever interfaces are exposed for the transfer of critical information, cybersecurity must be one of the paramount considerations.

The Authority should therefore be open to the concept that different distribution system operators might hold different 'bundles' of CRF, but will nevertheless be able to perform the necessary tasks, in coordination with other relevant entities (e.g. TSO, aggregators) in an efficient and effective manner. This could, for example, include a distribution system operator developing the capabilities to dynamically allocate export capacity to multiple DER owners on an occasionally constrained section of network, ahead of a compelling case for providing other DSO functions.

[2] https://www.ena.org.nz/our-work/resources/edb-requests-for-non-network-alternative-services

2. 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?

ENA generally agrees with the approach the Authority has laid out in the consultation paper. We re-emphasise one of the points made in our submission[3] to that earlier consultation: that the "… provision and exchange of key network planning and operational information between network planners and operators…" is an important foundational task. This can be expressed more generally, and is identified as a theme in this consultation paper, as the need for more coordination of power system operation. This in turn (in our view), speaks to the criticality of having open, secure and well-established standards for information exchange across the different planning and operating entities in the power system, irrespective of where individual entity CRF boundaries are drawn. Note that accountability for certain roles and functions should be consistent - otherwise it will create confusion – but there should be flexibility around who is responsible for delivery (i.e. that specific capability may be outsourced by the accountable party).

3. 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?

ENA agrees that the Authority has accurately covered the main drivers of change in the distribution system. The Authority also acknowledges something that we wish to highlight: that there are many individual distribution networks where the drivers of change listed here are NOT occurring – or not occurring at such a pace that an immediate change to system operation is necessary. It is important that the Authority keep in mind that the pace of changes in consumer behaviour, technology adoption, market development, etc is highly variable across NZ, and any future regulatory intervention in the sector needs to be mindful of that diversity.

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

ENA completely agrees with the Authority's definition of the challenges ahead with respect future system operation – as primarily one of coordination between different system operators and related entities. This should be considered in the context of striving to achieve greatest system value, over the long-term (i.e. not solely focussed on set-up costs) and affordability for consumers, rather than necessarily lowest system cost.

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

As a general observation, ENA believes that both the Australian and British deliberations around DSO are highly relevant to the NZ context – while we shouldn't feel bound to follow the same course necessarily, there is a great deal we can learn by following the example set by these two

[3] https://www.ena.org.nz/assets/DMSDocuments/2024-4-19-FSO-submission.pdf

jurisdictions. This view is what led the FNF CRF project team to commission Baringa to produce the *Potential models for distribution system operation (DSO) in Aotearoa* report[4].

A key question that the NZ electricity system will need to address and resolve is how distribution system operation will be enabled, including how this capability is incentivised through regulatory frameworks. Currently, many of the existing EDB functions that might also be considered DSO functions are paid for by distribution network customers as part of the regulated lines function service, overseen by the Commerce Commission. As these functions become increasingly advanced, and if new CRFs are added to the EDB portfolio, the case for funding these via lines function service revenue may increasingly break down – where the benefit of the DSO 'service' does not directly or obviously accrue to the recipients of the EDB lines function service, or not wholly to those individuals.

It may therefore be useful and instructive to consider both the Australian and British approaches to funding the new DSO CRFs. Tightly integrated with the question of the funding model is the question of how DSOs are incentivised – what does 'good' look like with respect to the DSO CRFs, and how do we incentivise those outcomes?

Finally, it is note-worthy that both the United Kingdom and Australia, tacitly or explicitly, have decided to have their EDBs evolve into performing the DSO role (with some carve-outs in some cases, e.g. UK EDBs do not perform the regional planning and market facilitation roles[5]).

6. 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?

ENA supports the work carried out by NEG and SIDG related to DSO CRFs as important contribution to sector-wide understanding of future system operation in Aotearoa.

7. 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?

ENA believes that the Authority should wait until emerging functions of distribution system operation, such as local flexibility services, are more developed before considering the need for an iDSO. We strongly endorse the conclusions in the Baringa report[6], slides 35-38, that (in summary) state that many of the benefits that an iDSO model could provide – primarily, guarding again conflicts of interest or perceptions thereof– can be achieved via existing mitigations and controls (e.g. transparency of planning and decision-making, robust regulatory and civil avenues for recourse against anti-competitive behaviour, etc). In addition, the Baringa report notes that to establish an iDSO model in NZ would likely require that some existing EDB functions be moved in some way to the new iDSO, and that this in and off itself creates a significant degree of regulatory complexity and change.

[4] https://www.ena.org.nz/our-work/news/new-report/document/1544
[5] https://www.ofgem.gov.uk/decision/decision-future-local-energy-institutions-and-governance
[6] https://www.ena.org.nz/our-work/news/new-report/document/1544

ENA is of the view that the appropriate, prudent approach, is to discount the iDSO model while system and market develop is still somewhat nascent, but to be careful that any decisions taken by the Authority do not unduly preclude moving to that model in due course, should it be needed. This would only be appropriate once the roles and functions required of that entity in comparison to others are more clearly understood. It would be difficult to allocate roles and functions to an iDSO early in the development of the future system operating model, as it would still be unclear what the full suite of necessary CRFs is.

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

ENA believes that the Authority's proposal of three high-level DSO models – Total TSO, Hybrid, and Total DSO is a useful and appropriate framework for discussing future system operation arrangements in NZ. The Authority will be well aware that these models are consistent with the framework developed in the Baringa report[7], and ENA wholly endorses that work and it's framing of system operation models and have nothing further to add.

9. Do you prefer one model over the others?

ENA strongly prefers the hybrid model, for the following reasons:

- **Adaptability and Flexibility:** This model is inherently flexible and can adapt to changes in market development and local needs over time, preserving the greatest degree of optionality for the longest possible time. This in turn allows different parts of the system to evolve at their own pace while maintaining overall coordination – though note some challenges to this in the following paragraphs.
- **Pragmatic evolution:** We believe that this model has the least/lowest barriers to entry. In many ways, this model requires the building out of existing capabilities in both the system operators and EDBs and is therefore the most evolutionary and to some extent 'easiest'.
- **Promotes Whole-of-System Value:** This model allows for and enables both national and local participation in the operation of distribution networks and crucially can be (and is being) done now, without the need for any regulatory interventions.
- **Leverage existing strengths:** This model is best suited to recognise and respond to local (i.e. distribution) network conditions. By incorporating the EDB into the operating model, all the local network insight is made easily accessible to the DSO.

The hybrid model will need clear processes in order to handle the interaction between local and national markets – to prevent flexibility resources operating in contradictory and unhelpful ways and in to ensure some appropriate mechanism for prioritisation of response. This needn't be a 'merit order' per se, but some means by which the optimal use of resources can be achieved when competing needs are present on both national and local networks/markets.

ENA also strongly advocates for bringing third-party controllers of load and export on distribution networks (i.e. flexibility service providers/aggregators) into the Code as industry participants – in

[7] https://www.ena.org.nz/our-work/news/new-report/document/1544

line with distributors and traders. In this way they can be subject to appropriate obligations and requirements, as are other participants.

ENA does not prefer the total TSO model, as:

- It is likely to be the most expensive to implement of the models presented
- It is likely to be less effective at creating 'whole of system value' than the other models presented
- It is likely to require significant regulatory intervention to achieve
- It is likely to take longer to implement than the other models presented
- It will not enable customer choice to the extent that the other models presented will

ENA does not prefer the total DSO model, as:

- It is likely to be the more expensive to implement than the hybrid model
- As with the total TSO model, it is likely to:
    - require significant regulatory intervention to achieve
    - take longer to implement than the hybrid model

10. 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?

Based on ENA's FNF work and the Baringa report[8], we propose an allocation of functions that broadly aligns with the following principles:

- **Leverage Local Knowledge:** Functions requiring granular, real-time understanding of specific distribution network conditions and local customer behaviour are best performed by EDBs.
- **National System Optimisation:** Functions requiring a holistic view of the entire power system and central market mechanisms should reside with the TSO.
- **Minimise Duplication and Hand-offs:** Design interfaces and protocols to streamline information exchange and avoid unnecessary complexity, while ensuring security
- **Foster Competition and Neutrality:** Ensure that the framework supports a competitive market for flexibility services.

ENA therefore considers that the best allocation of DSO CRFs, between TSO and EDB(s), would be roughly as below.

[8] https://www.ena.org.nz/our-work/news/new-report/document/1544

EDB (as distribution system operator) functions would include:

- Planning for flexibility at a local (i.e. distribution) level
- Real-time Network Operations/Active Network Management
- Distribution Market Mechanisms + clearance and settlement
- Integrated Distribution System Planning (incl. flex connections and DOEs)
- Emergency Management – certainly for local and regional emergencies, and possibly also orchestrating local responses to national emergencies - especially restoration of load from all emergency events
- Data Management and Visibility

TSO functions would include:

- National emergency management
- Wholesale Market Interface
- System-Wide Orchestration
- Aggregated Data Flows
- Standardisation and Interoperability (in collaboration with EDBs/DSOs)"

11. 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?

In terms of enabling 'the wholesale market ideal' for price discovery in flexibility services, the missing piece of the puzzle is clearly the distribution network capacity and constraints, where significant latent value can be unlocked. It follows then that the most efficient and effective way to make those characteristics available to flexibility service providers is to have the party with the most immediate access and insights to local network conditions (the EDB) perform the role of exposing it to the local flexibility market. Therefore, ENA prefers both the hybrid and then the total DSO models as the highest ranking in these terms. We do not have a strong preference with regards to either iDSO or total TSO, though we note that the latter would allow DSO CRFs to fall to an existing industry entity, rather than having to stand up an entirely new one.

Appendix B: ENA Members

Electricity Networks Aotearoa makes this submission along with the support of its members, listed below:

- Alpine Energy
- Aurora Energy
- Buller Electricity
- Centralines
- Counties Energy
- Electra
- EA Networks
- Firstlight Network
- Horizon Networks
- Mainpower
- Marlborough Lines
- Nelson Electricity
- Network Tasman
- Network Waitaki
- Northpower
- Orion New Zealand
- Powerco
- PowerNet (which manages The Power Company, Electricity Invercargill, OtagoNet and Lakeland Network)
- Scanpower
- Top Energy
- The Lines Company
- Unison Networks
- Vector
- Waipa Networks
- WEL Networks
- Wellington Electricity
- Westpower