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Electricity Authority
PO Box 10041
Wellington 6143

Submitted via email to fsr@ea.govt.nz

Consultation paper – The future operation of New Zealand's power system – Issues and high-level options

Introduction

1. Orion welcomes the opportunity to submit on the consultation paper 'The future operation of New Zealand's power system – Issues and high-level options'.[1]
2. Orion owns and operates the electricity distribution infrastructure in central Canterbury, including Ōtautahi Christchurch city and Selwyn District. Our network is both rural and urban and extends over 8,000 square kilometres from the Waimakariri River in the north to the Rakaia River in the south; from the Canterbury coast to Arthur's Pass. We deliver electricity to more than 236,000 homes and businesses and are New Zealand's third largest Electricity Distribution Business (EDB).

Executive summary

3. Orion supports the Authority's investigation into the Future System Operation and respective DSO Models and how these have been defined.
4. However, we submit that the decision making is occurring too early, with too much focus on defining operator roles rather than mapping the operational functions required to realise whole-of-system value in New Zealand. We recommend the Authority deepen its analysis of existing EDB functions before determining what additional structures are needed, rather than importing overseas DSO models that may not suit New Zealand's unique network topology and rural context.
5. Orion supports the organic development of DSO functions within the sector, and notes that several EDBs (Orion included) are already performing functions that could be considered DSO functions. Orion specifically undertakes several functions including control period demand for major customers (dynamic price-based response), hot water load control, Upper South Island Load Manager, and contracted flex trials in the Lincoln area.[2]
6. Our specific responses to the questions posed by the Authority are set out in Appendix A.

[1] Consultation Paper - The future operation of New Zealand's power system – Issues and high-level options
[2] Industrial Demand Flexibility

Key themes from our submission

7. **Focus on operational functions, not operator roles**: The electricity sector is becoming increasingly complex at the distribution network layer. Rather than attempting to shift this complexity, the focus should be on mapping the functions required to achieve the greatest whole-of-system value and supporting the organic growth of Distributed System Operators when required.
8. **Acknowledge distributor diversity**: Several EDBs are already performing functions that could be considered those of a DSO and several EDBs are years away from the same. This extends to the future and how each distributor gains the functionality required for future system operation. The Authority needs to acknowledge this diversity in any decisions they make and consider how the Code allows for this diversity.
9. **Start with the New Zealand context, not overseas models**: The consultation paper relies heavily on Australian and UK DSO models, without adequately considering New Zealand's network topology. . Additionally, New Zealand's diverse EDB ownership structure - including consumer trusts, councils, and listed companies – affects DSO implementation costs and benefits, as different ownership models may create different incentives and capabilities for performing DSO functions.
10. **The three models**: Orion is generally supportive of the Total DSO and Hybrid models. We do not support the Total TSO model. We submit that more work needs to be done to understand what an efficient hybrid model might look like in practice. Orion notes that the Hybrid model offers more flexibility for developing DSO functions within the industry and not trying to label the participants too early.

Concluding remarks

11. Orion supports the ENA's submission in principle.
12. This submission is not confidential and can be publicly disclosed.
13. We strongly encourage the Authority to coordinate with relevant industry stakeholders and workstreams, especially the ENA's Future Networks Forum and EDBs, to ensure coherent system-level outcomes.
14. If you have any questions or queries on aspects of this submission which you would like to discuss, please contact us on 03 363 9898.

Yours sincerely,

Gareth Stewart
Network Transformation Manager

Please contact Mitchell Davis for any queries related to this submission at [redacted]

Appendix A Format for submissions

Submitter	Gareth Stewart

Questions	Comments
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?	Yes. Orion agrees with the explanation of the operator roles and operation functions. However, there is a shortfall in quantifying the functions, and too much focus on considering who may perform them. We believe it should be made clear when discussing operator roles and operation functions that EDBs in New Zealand already perform several functions that may be considered functions of a DSO (such as the ripple control of hot water, and in Orion's case, our control period demand signal which provides a dynamic response to a price signal). Several EDBs in New Zealand are already procuring and operating these types of services[3]. Orion submits that the Authority should focus on the efficient performance of these roles rather than who is performing them at this stage in New Zealand's DSO journey. Several of the functions defined in this consultation are inherent to existing EDB processes and would need to be carefully transitioned over time, where this is considered necessary. Additionally, the Authority should remain careful when trying to promote competition in this space to ensure that a focus on developing competition doesn't hinder progress in the implementation of DSO functions. This is about ensuring that any regulation of functions doesn't inadvertently reduce a customer's ability to access and support whole-of-system value by limiting their ability to value stack into different markets.

[3] ENA's Request for non-network services page

	We believe that it is too early for the Authority to make a material decision on how the sector should be re-structured with respect to distribution system operators and operations. Instead, the Authority should be focused on keeping options open and better defining DSO functions before determining whether any change is needed to who delivers them. . Under each proposed model for DSO, different organisations will perform different functions. It is Orion's opinion that the Authority should incentivise participants to ensure the functions are being performed efficiently and that this will form an organic path to DSO. It is worth noting that the Commerce Commission's IRIS (Incremental Rolling Incentive Scheme) and INTSA (innovation and non-traditional solutions allowance) already incentivise EDBs to procure flexibility services and investigate non-traditional solutions (non-network solutions and non-wires solutions). It would be counterproductive to this emerging market if prescribed DSO roles and responsibilities cut across the procurement and operation of these resources. Further to this, Orion would like to point out that the Registry is not sufficient to provide the level of technical detail required for the efficient visibility and control of distributed energy resources and customer energy resources. This is fundamental to any of the three DSO models and therefore is a no-regret area of focus for the Authority[4]. Orion has previously submitted on this saying: "The Electricity Registry is not designed to support modern data exchange requirements. The Registry's current architecture cannot adequately support the data-rich, interconnected system envisioned for New Zealand's digital electricity future."[5]

[4] This would also support future implementation of MTR as noted in our submission
[5] Further detail can be found in our submission to Our Future Is Digital Consultation Paper

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?	Yes. Orion agrees that there is opportunity for the Authority to focus on system operation at a distribution level. Investigating and outlining the new functions required for effective distribution system operation is paramount to understanding and realising whole-of-system value. This also supports the identification of which DSO model is the most efficient for realising customer value by identifying the functions each participant is capable of providing efficiently and where the boundaries of each Participant naturally sit. Orion supports the need for increased data and network visibility. We believe the Authority should be actively considering the cost of this data and who should be responsible for supplying this data, and at what cost. This relates directly to the theme of a need for more coordination of the power system (paragraph 3.9) identified by the Authority. Orion agrees that more system coordination is required now and into the future. We would like to call the Authority's attention to the work being done on an industry-wide Load Management Protocol (LMP) and the importance of coordination in emergency situations, and in line with existing Code requirements. These situations must be considered when evaluating the future structure of distribution system operation.[6] Orion believes that DOEs should not be the default or a prescribed regulatory solution to managing network capacity. This is one possibility among many future operational considerations that could be used to manage capacity an innovation in this area should, for now, be allowed to evolve without regulatory intervention. Orion seeks clarification of how these issues will be addressed and by whom. It is Orion's opinion that INTSA could play a central role in gaining a real-world understanding of consumer behaviours and that EECA's role in understanding consumer behaviour and encouraging participation should be clarified.

[6] https://www.ena.org.nz/our-work/working-groups-and-forums

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?	Yes. Orion generally agrees with how the Authority has summarised the changes to the distribution system. However, Orion also believes the Authority has missed a number of key aspects including: • A lack of load and generation diversity caused by distribution connected resources responding to system level signals without visibility or consideration of local network conditions (CER/DER responding to wholesale market price alone as an example).The system operator interacting with distribution networks is not a change to the current way of operating, however Orion agrees with the need for standardised interactions, operating procedures, and communication protocols. The commentary above related to the LMP is relevant here. • A lack of consideration of the aggregated influence of small-scale passive DER is noted. While we agree there is unlikely to be system level impacts in the short term, Orion believes the impact of these systems needs to be considered and managed before an issue arises, not when one does. This is particularly true for system operation at a distribution level, with the potential for small clusters of DER/CER to cause issues at low voltage levels of the network. Orion is particularly concerned about what appears to be a lack of concern related to LV network congestion and how this will be managed before it becomes a system level issue. The LV network, if not considered, will have to be built significantly to allow for flexibility that optimises other parts of the electricity system. Orion also believes that there is a gap in consideration around how the Authority (or any other participant) will calculate whole-of-system benefit.

Q4. Do you agree with how we have defined the problem, as the need for a more coordinated framework of integrated system operation?	Orion agrees with the definition of the problem as one of coordination in the system. We would like to call out a lack of commentary around how the system becomes integrated to allow this coordination and suggest that the Code as currently written doesn't support this outcome. We suggest that the Authority focuses on providing the sector with the guard rails required to achieve the desired outcome rather than enforcing regulation in the short term. We believe the cross-sector work on a common-LMP is testament to how sector collaboration can achieve the right outcomes if the authority sets the correct guardrails in place.
Q5. In your view, what aspects of the Australian and British deliberations around DSO models are relevant to New Zealand?	Orion believes that there are aspects of both the Australian and UK DSO constructs that the New Zealand implementation can learn from. However, we believe that we shouldn't be limited by the decisions they made. New Zealand context is required to ensure the right outcomes. At an ICP level, smart meter penetration is particularly important and as noted in the Baringa Report[7], New Zealand has a high smart meter penetration by international standards. There are several other differences in the NZ context identified in this report that the EA should consider, and Orion endorses this work. Further, Orion considers that learning in the context of doing was a key success in both Australia and the UK, and letting participants organically grow the required functions by providing guard rails, and not enforcing regulation, is likely to lead to the most efficient outcomes.We believe the INSTA is a key enabler of this approach and we support the Commerce Commission making it more accessible.
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?	In principle, Orion supports the direction of research being conducted, particularly that by the ENA and SIDG.

[7] NZ Context from the Baringa Report (page 16)

	Orion particularly supports research and work that is focussed on identifying the operation functions over deciding operator roles. It is Orion's view that the latter will evolve organically as participants implement the required operational functionality. If the Authority believes this is not occurring, or is not occurring at the desired rate, we would encourage them to provide incentive schemes in the first instance over prescriptive regulation.
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?	Orion believes the Authority should wait before deciding on the need for an iDSO and that this approach is supported by learnings from the UK context. In Orion's opinion it is still too early for the Authority to attempt to define what functions would be performed by an iDSO and what would remain the responsibility of a DSO/DNO or TSO. Additionally, Orion supports the conclusions noted in the Baringa Report on DSO Roles and Functions that (*paraphrased in summary*) the cost of implementing an iDSO would not outweigh the benefits, primarily to guard against conflicts of interest, and that the regulatory landscape in New Zealand would need to undergo significant and complex change to achieve this.[8] Finally, Orion also questions if New Zealand is of a scale where true independence in operation is achievable or of value. Before considering iDSO models, the Authority should establish whether New Zealand needs any form of formal DSO structure and what specific benefits these would deliver. The iDSO question assumes that DSO functions require institutional separation from network ownership, but this may not be the case given New Zealand's unique network topology and scale diversity. With EDBs operating as isolated spokes connected only to Transpower, many serving rural areas with limited DER penetration, the coordination opportunities that justify DSO complexity may be limited.

[8] https://www.ena.org.nz/our-work/resources/webinar-on-potential-dso-models-for-aotearoa/document/1544

	In addition, many EDBs already perform several of the core functions described in DSO models – network operation, DER coordination, and flexibility procurement – within their existing business structures. Rather than creating new institutional layers, the Authority should assess whether enhanced planning and operation protocols for coordination between EDBs and Transpower could achieve the same outcomes more efficiently. For these reasons, Orion suggests the Authority shelve the option of an iDSO until and if there is an identified need for one in New Zealand, noting that Orion sees this outcome as unlikely.
Q8. What do you think about the three DSO models proposed by the Authority?	Orion is supportive of how the Authority has presented the three models for consideration but notes that supporting a hybrid model raises a series of additional questions and should be presented as a spectrum rather than a discrete choice. For this reason, it is Orion's belief that the majority of the value in the short term can be found not from labelling the operator but from focusing on the implementation of the operational functions. It is not necessary at this early stage to name each aspect of the system, and any regulatory considerations should reflect a need to develop the functionality over identifying the system participants that fulfil each role. Orion believes that the Total TSO and Total DSO model in theory make defining the roles and functions simpler, but does not believe this outweighs the complexity or cost of their implementation. These conclusions are consistent with those found in the Baringa Report and Orion endorses this piece of work.
Q9. Do you prefer one model over the others?	Orion does not believe at this stage that enough of a comprehensive cost/benefit analysis has been done to pick a winner this early. However, we believe that the Total TSO model should be discounted from consideration due to the complexities associated with the Transmission System Operator shifting to such a granular level of control and the associated costs. Orion does not believe this is the route to maximising consumer benefit and that it would result in unnecessary cost across the system.

	Further, Orion believes more clarification is required around the complexity of the functions performed by each participant under the Total DSO model, including which of the energy balancing functions performed by the system operator today would need to be implemented by a DSO under this model. Orion supports further investigation into the spectrum of options held within the hybrid model and the completion of a comprehensive quantified cost/benefit analysis at the appropriate time. Finally, in general, Orion supports the Hybrid model and related spectrum of options due to the flexibility this model offers with respect to the organic development of operational functions by sector participants and the efficiency this approach offers. The Hybrid model also ensures that momentum will be maintained across EDBs who are already developing DSO functions. It would be detrimental to system security, affordability, and sustainability if this were to occur. To ensure the efficiency of this approach, Orion is supportive of any work done to define Aggregators as sector participants in the Code.
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?	Orion believes further work is required before this question can be answered. There is a need to map the required functions that are required in New Zealand's unique context, before attempting to allocate them to the current or new participants. Orion suggests the EA use the outputs from the ENA CRF project which identified key roles and functions as a starting point for this work. Orion submits that further work, aligned with the ENA FNF and the Baringa Report, should be supported to guide the industry on answering this question. Orion notes that the existing Baringa Report provides principles for the allocation of functions and supports this approach with respect to ongoing work between all impacted sector participants to map the DSO functions.

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?	Orion has no explicit comment to this question. However, we believe the Authority should first consider how existing more centralised generation, and utility scale embedded generation of 10 MW or greater connected to distribution networks, should be dispatched as more renewable generation enters the market.