

19 April 2024

Sara Gilles
Chief Executive
Electricity Authority
Via email to FSR@ea.govt.nz

Dear Sarah

ENA thanks the Authority for the opportunity to respond to the consultation on *the future operation of New Zealand's power system*.

ENA is the industry membership body that represents the 27 electricity distribution businesses (EDBs) that take power from the national grid and deliver it to homes and businesses across the motu. ENA harnesses members' collective expertise to promote safe, reliable, and affordable power for our members' customers.

Ensuring the efficient future operation of the power system will require alignment and coordination across the sector, far beyond what exists today. This alignment will need to go far beyond the scope of this consultation paper and the Authority's purview. Delivering an efficient future system will need action from policymakers, regulators and sector participants alike. These actions must include:

- building public awareness and a consistent narrative of what the future power system means for users,
- enshrining access to timely and accurate data for all parties that contribute to the operation of the power system,
- ensuring the standards for evolving technologies enable, not stall the efficient operation of the power system including EV charges, PV inverters and battery energy storage systems,
- making certain that the sector's regulatory regimes including the Code and Part 4 of the Commerce Act are dynamic and responsive, and
- getting the policy settings and narrative right via effective national policy statements for the power sector including electricity distribution.

ENA's Future Network Forum has a significant project underway to understand the roles and functions necessary in the power system – and particularly the distribution sector – to enable distributed flexibility in the near to long term. We have endeavoured to incorporate some of the early insights arising from this work into the answers we have provided here to the Authority's consultation questions.

However, we encourage the Authority, to the extent that it can, to wait until the full 'Roles and Functions' whitepaper is available. This will provide the Authority with a well-considered and coherent view of the elements the distribution sector thinks are necessary to support an effective market for flexibility that will deliver value for both consumers and industry

participants. The Future Network Forum will engage fully with the wider electricity sector (including the Authority) on the 'Roles and Functions' whitepaper as soon as possible.

Below are ENA's responses to the consultation questions set out in Appendix B of the consultation paper.

Yours sincerely,

Richard Le Gros

Policy and Innovation Manager

ENA responses to consultation questions

QUESTIONS FOLLOWED BY COMMENTS

Q1. Do you consider section 3 to be an accurate summary of the existing arrangements for power system operation in New Zealand? Please give reasons if you do not agree.

A1. ENA generally agrees with the Authority’s characterisation of the operation of New Zealand’s power system. We do wish to emphasise that some attributes of ‘system operation’ are already tightly bound up with the role EDBs perform in the New Zealand power system today, such as hot water load control (HWLC). At the distribution level, the distinction between network owner and system operator may not be as clearly delineated as at the transmission level much of what is included under the heading “asset ownership” in Table 1 is in fact system operation for distributors (i.e., power quality and the security of the distribution networks under their control, including monitoring voltages and power flows).

Q2. Do you agree that we have captured the key drivers of change in New Zealand’s power system operation? Please give reasons if you do not agree.

A2. ENA broadly agrees that the Authority has captured many of the key drivers of change in the NZ power system, however, we think that some of the drivers could be amended to better express the underlying source of the effects being caused. For example, some of the drivers expressed here as ‘...technology’ are perhaps better described as behavioural changes, which have, at least in part, been enabled by new technologies.

For example, in the consumer space we are seeing greater energy literacy from consumers, and a greater willingness to participate in e.g. environmental objectives through their consumption choices. The Consumer Advocacy Council has done some helpful work¹ on insights into consumer behaviour which could help to inform this.

Separately the drivers presented capture the concept of flexibility well, however, it doesn’t appear to reflect on the extent to which a flexibility *market*, as it emerges and matures as the value of flexibility increases, can in itself be a significant influence upon how the power system as a whole will evolve.

Lastly, the drivers presented here reflect a degree of certainty about influences on the power system that are becoming increasingly uncertain. This is driven not just by uncertainty around consumer behaviour, technology adoption, etc, but also by political and regulatory uncertainty. For example, what technologies might the government choose to incentivise? Or de-incentivise? How will the ETS be evolved or strengthened, and what effects might this have? What about the geo-political situation? What energy and technology choices might this influence? To reflect all these concerns, there could be a new

¹ <https://www.cac.org.nz/our-work/surveys/consumer-behaviour-survey-2023>

driver added to reflect this increasingly uncertain world in which critical decisions still need to be taken. Alternatively, this uncertainty could be incorporated into the existing drivers as a general blanket statement to the uncertainty that surrounds many of these issues.

Q3. Do you have any feedback on our description of each key driver?

A3. The Authority's descriptions of the key drivers are well-considered and accurate. The only feedback ENA would like to offer relates to 'Key driver 5: Climate change and extreme weather events'. The Authority's description appears to focus (or implies a focus) on the more immediate, operational effects of climate change-induced weather, e.g. the interruption of electricity supply to consumers caused by the pluvial flooding of a substation.

For the power system's infrastructure owners and operators – particularly of the electricity networks – there is a second, and arguably more important, effect. These infrastructure owners will need to make significant investments, both now and into the future, to adapt their infrastructure to the effects of climate change (i.e. climate change *mitigation*). This will ensure that, in the aforementioned flooding example, the electricity supply infrastructure is not affected by rising water levels and the supply to consumers is not interrupted.

As we face a future where decarbonisation requires electricity to increasingly be the major (often only) source of energy for day-to-day operations, customers will have heightened expectations around the resilience and reliability of their electricity supply. The electricity industry cannot expect to have customers invest in switching their operations to electricity if it cannot then provide an acceptable level of supply security. This in turn will put even more pressure on EDBs to invest in helping ensure they can provide to customers' expectations.

This confluence of factors – increasing climate change effects and increasing reliance on electricity as the primary energy source – will in turn give rise to heightened capital expenditure, which could lead to constraints on other areas of network investment.

Combined with and in response to these climate change and electrification drivers', technology in the electricity sector is evolving and being deployed at a rapid pace. This technological change is manifesting in a variety of ways across the electricity value chain including:

- change in *generation technology* including the large-scale deployment of inverter-based generation, and the emergence of synthetic inertia
- changes in *consumer technology*, including opportunities created by granular management of loads and technologies that allow new industries to electrify via electrified transport and process heat technologies

- changes in *operational technology*, that allow the system to operate in new and more flexible ways including the establishment of dynamic operating envelopes and flexible connections and the management of flexibility systems
- changes in *data and digitalisation technologies*, that allow for the analysis and use of granular and real-time data at scale, to optimise the electricity system via the monitoring and control of devices (including consumer technologies) via IoT technology.

The pace at which technological development has and will continue to occur will most likely outpace the regulatory framework’s ability to embed/support/provide oversight of these technologies. Therefore any regulatory regime that seeks to support future system operations will need to be more dynamic and responsive.

Q4. What do you consider will be most helpful to increase coordination in system operation? Please provide reasons for your answer.

A4. ENA considers that the provision and exchange of key network planning and operational information between network planners and operators – where there is interconnection between those networks – is an appropriate first ‘cab of the rank’ to increase coordination in system operation. Enhancing the visibility of the key drivers of network use in both a planning and near real-time timescale will ensure that the relevant decision-makers within these organisations can be confident they are armed with the necessary information to make rational and prudent decisions.

The types of information to be exchanged in this way could initially include:

- medium and long-term demand forecasts
- distributed generation capacity and disposition
- DER capacity and disposition
- Contracted volumes of DR, including type of DR and disposition
- Uptake and use of ToU or other ‘dynamic’ retail tariffs by consumers (this could be considered a subset of the bullet point above)
- Data obtained/derived from AMI²

For EDBs, the primary initial focus for improved coordination via the exchange of data is increasing the visibility of DER for distributors. This visibility, enabled by data, is required to maintain the accuracy of planning and operation forecasts and coordinate the use of resources.

In the longer term, as we move into an environment where flexibility services and associated trading become more commonplace, the requirement for information exchange between various parties will become even more demanding. For successful future market operations, it will be essential to have agreed standards and protocols in place for data

² The AEMC has recently decided to require AMI data to be made available for free via the AEMO data portal. <https://www.aemc.gov.au/rule-changes/accelerating-smart-meter-deployment>

accessibility and exchange. This exchange of data will be with a much wider group than merely between various network planners and operators.

Given these types of information will almost certainly be required by the network owner/operator to which it relates, there should be relatively little additional cost and complexity involved with making it further available to any other interconnection network owner/operators – with appropriate caveats and safeguards around data security, privacy, etc.

These data exchange challenges will not be limited to network and operation planning, but the management of the entire electricity industry. Therefore, ENA recommends the Authority undertake a detailed review of the overall data systems architecture to ensure it is capable of supporting and enabling a future environment of real-time and complex data exchanges. This review should include a contractual framework that ensures data is provided at efficient prices.

The ENA Future Network Forum has a project underway examining roles and functions to enable distributed flexibility. The project will collaboratively define future roles and functions to enable the evolution of distribution system operations and unlock whole-of-system value. The project is in the first stage which is focused on building alignment on the definition of potential roles and functions. Following this stage, the project may progress to a second stage which would consider different industry architectures to fulfil the identified roles and the impact of those arrangements on distributors.

The electricity network sector, through the ENA's Future Networks Forum (and other working groups/fora) is already discussing some facets of the above information exchange that are considered necessary. It should be a relatively small step to formalising these arrangements in either some voluntary industry guidance document or similar, or if necessary, in the Code.

Ensuring that coordination delivers tangible positive outcomes for New Zealanders, and avoids the risks associated with the lack of coordination between the growing number of players in the sector is critical. ENA believes that clarity on the expectations and responsibilities of flexibility service suppliers managing assets in an emergency is necessary to support increased coordination of system operation at a national and distribution level.

Only once the above approach to coordination has been implemented, and the results considered, should the Authority consider a more interventionist approach to driving more coordination into the electricity system.

Q5. Looking at overseas jurisdictions, what developments in future system operation are relevant and useful for New Zealand? Please provide reasons for your answer.

A5. ENA is aware of system operation developments in overseas jurisdictions, and has paid close attention to those occurring in Australia and the United Kingdom. The upcoming

'Roles and Functions' whitepaper will examine approaches and learning from other jurisdictions.

ENA considers that the UK approach, led by their regulator (Ofgem), is the most advanced example of a deliberate and concerted effort to consider the requirements for a 'DSO' and the establishment of such entities to fulfil clearly defined roles and functions. In addition, the UK is further down the path of modernisation of power system operation than either Australia or New Zealand, and so provides a better view of the more long-term changes that are required.

The Australian experience in managing the impacts of mass DER uptake on low voltage networks, will also be useful in the development of the future system operation model and should be considered.

In the New Zealand power system context, the key outcome of the UK experience was a careful process that endorsed an approach whereby the incumbent network owners (DNOs in that context, EDBs in New Zealand) would over time transition to becoming DSOs. The UK regulatory and wider industry carefully considered the benefits and potential downsides of allowing the UK EDBs to assume the DSO role, and concluded that this was ultimately the best course of action to take.

The Authority should draw insight and inspiration from Ofgem's recent decision on the Future of local energy institutions and governance³ and the process that fed into it including the options considered and consultation responses from global leaders in local flexibility markets⁴.

The three core pillars of the Ofgem package are:

1. energy system planning, including the introduction of Regional System Planners to ensure there is accountability for regional energy system planning
2. market facilitation of flexible resources, via the assignment of a market facilitation function to a single entity with sufficient expertise and capability, to deliver more accessible, transparent and coordinated flexibility markets
3. real-time operations, retaining real-time operations within the distribution network operators (DNOs), and ensuring clear accountability for network reliability.

Q6. Do you consider existing power system obligations are compatible with the uptake of DER and IBR-based generation? Please provide reasons for your answer.

A6. ENA considers that the existing power system obligations are largely compatible with an uptake of DER and IBR-based generation. However, and consistent with our response to

³ <https://www.ofgem.gov.uk/sites/default/files/2023-11/Future%20of%20local%20energy%20institutions%20and%20governance%20decision.pdf>

⁴ <https://www.ofgem.gov.uk/sites/default/files/2023-07/Non%20Confidential%20Responses%20to%20the%20CFI.zip>

question 4, we think there are some changes required to improve the visibility of DER, etc to ensure stable and secure operation of the power system.

The Authority has largely identified these in its preamble to question 6 in the consultation document, but to reiterate, network operators (and other market participants e.g. aggregators) will need visibility of:

- distributed generation capacity and disposition
- DER capacity and disposition
- contracted volumes of DR, including type of DR and disposition
- uptake and use of ToU or other 'dynamic' retail tariffs by consumers (this could be considered a subset of the bullet point above)
- data obtained/derived from AMI.

One approach would be to amend the existing Part 6 of the Code such that greater information of DER is obtained at the time of installation – as happens to a limited extent now – and that this encompasses all types of DER, not just small-scale DG, which is largely roof-top solar PV installations in practice. An alternative solution would be to ensure flexibility traders/aggregators are registered with their host EDBs, and have clearly-defined and agreed operating protocols in place.

The Authority has already signalled that it is working on changes to enable greater access to AMI data for EDBs and other market participants, and this too is key. ENA encourages the Authority to continue its work in this area at some pace. It is worth noting that under the current paradigm, the charges for EDBs to access AMI data are significant. In developing their proposals, we encourage the Authority to think carefully about what reasonable access to AMI data for EDBs, with respect to costs, should be.

Q7. Do you consider we need an increased level of coordination of network planning, investment and operations across the New Zealand power system? Please provide reasons for your answer.

A7. Yes, ENA considers that an increased level of coordination in network planning, investment and operations across the New Zealand power system **is** needed. The information exchanges described in our response to question 4 should be the first step taken to address this.

Q8. Do you think there are significant conflicts of interests for industry participants with concurrent roles in network ownership, network operation and network planning? Please provide reasons for your answer.

A8. ENA can see scope for perceived conflicts of interest to arise where an industry participant (e.g. an EDB) has concurrent roles in network ownership, operation and planning. However, we think that these perceived conflicts can be readily managed by the development and introduction of clear and transparent industry guidance and policy

documents⁵. These should describe how third-parties should expect interaction with those participants and how that should be managed (e.g. connection processes for new generation, policies for dynamic despatch of DER, etc).

In this way, those third-parties can have confidence that they are being treated fairly and consistently by the participant, and can hold them to account if they perceive that this is not the case.

It should be noted that, with respect to the examples given in the consultation document related to choosing between network versus non-network alternatives, there are a number of constraints, drivers and obligations imposed on EDBs that will inform the solution selected in any particular instance. These include the constraints of the Commerce Commission 'Part 4' regime, which might affect EDB capex or opex budgets, and the SAIDI/SAIFI penalties which might also influence the reliability expectations of the solution chosen. There are then technical and network planning considerations that might influence the decision, e.g. if a network upgrade or renewal is required in the relevant part of the network within say 10 years, it might be practical and prudent to use a 'traditional' network solution to increase capacity rather than opt for a non-network approach.

This is all to say that the choice between network versus non-network alternatives in any particular situation is non-trivial, and there are many factors that might influence an EDBs' decision on which is the best approach – not simply the most immediately 'cheapest' solution. As decisions around these types of trade-offs become increasingly common in the distribution networks, any solution to impose transparency and consistency of decision-making will need to be carefully considered to ensure it isn't unduly burdensome or constraining, and that it still gives rise to the best long-term outcomes for consumers.

EDBs already have some constraints imposed on them by the Code in terms of the related activities they may participate in – for example, the limits on the ownership of generation.

Lastly, where commercial interests are concerned, New Zealand has a robust framework of competition law, enforced by the Commerce Commission and ultimately the Courts, which are available to all, if these aforementioned processes are not sufficient to address the perceived conflict.

To the extent that the Authority is or may consider a regulatory intervention to address the potential conflicts described in this section, ENA encourages a very cautious and incremental approach, if at all. The reason for this is that many of the areas of rapid industry transformation (well described in the 'key drivers' section of this consultation) will be greatly accelerated by the interest and support of EDBs. This is because EDBs have the financial and technical capacity to engage in these emerging technologies and nascent markets, and a natural driver to do so as they seek to serve their consumers in the most

⁵ For example, ENW, a UK EDB, has recently published their *Operational Decision Making Framework*, to provide transparency around how they will make operation decisions in their role as DSO: see <https://www.enwl.co.uk/globalassets/future-energy/dso/operational-decision-making-framework/operational-decision-making-framework.pdf>

effective and efficient way possible. Were the Authority to intervene to preclude this, there is a risk that the withdrawal of EDB support would severely inhibit the deployment and growth of these new activities at a critical time, and also constraint the ability of EDBs to adopt 'non-alternatives' as well. There are also situations where EDBs can provide optimal, non-network energy solutions (e.g. remote area power supplies) that would not be economically attractive or viable for third-party providers. If these solutions cannot be pursued by the EDB due to restrictions in the Code, it could also result in a sub-optimal outcome for consumers. In this example, remote rural consumers may not be able to access a more appropriate energy source to meet their particular needs.

One final point to make is that there are already a significant number of embedded networks in New Zealand, of various types and configurations, serving a multitude of purposes, such as community micro-grids, shopping precincts, airports and ports, etc. The Authority should be careful to ensure that any obligations or constraints imposed on network operators do not unfairly or inadvertently impact on these activities.

Q9. Do you have any further views on whether this is a good time for the Authority to assess future system operation in New Zealand, and whether there are other challenges or opportunities that we have not covered adequately in this paper? Please provide reasons for your answer.

A9. The electricity sector is on the cusp of transformational change with large-scale electrification and decarbonisation across the country. Many EDBs have already been discussing what a future system might look like. They are already moving beyond their traditional roles, acting as facilitators and orchestrators in the energy market, focusing on proactive coordination among energy system players, and engaging consumers in DER management. The role of retailers and aggregators is also evolving. Because of this, ENA considers that now is a good time for the Authority to assess future system operation in New Zealand.