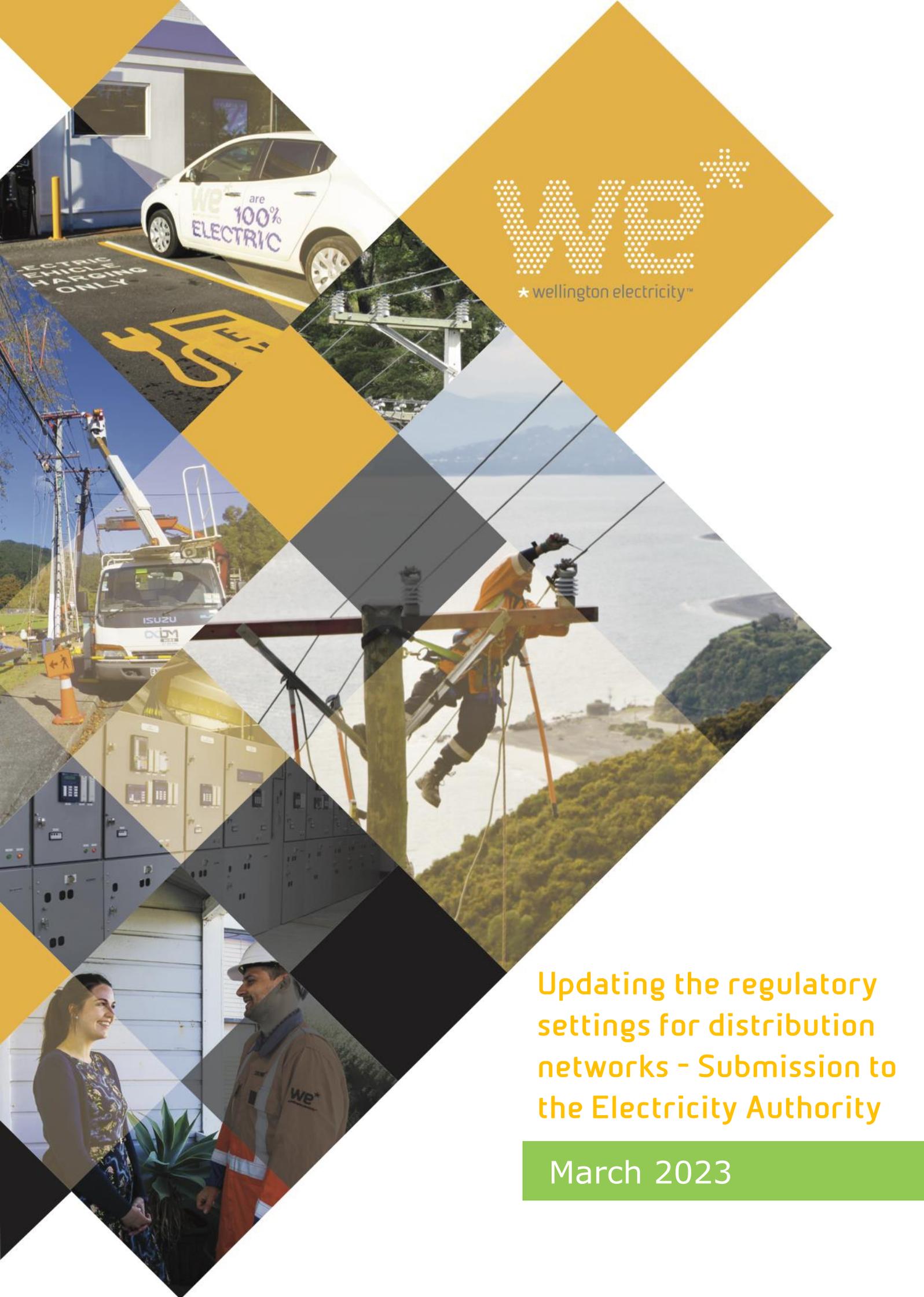




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# Updating the regulatory settings for distribution networks - Submission to the Electricity Authority

March 2023

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## 1 Submission and contact details

Consultation	Issues paper: Updating the Regulatory Settings for Distribution Networks
Submitted to	Electricity Authority ( <b>Authority</b> )
Submission address	distribution.feedback@ea.govt.nz
Date submitted	28 February 2023
Submitter	Greg Skelton, CEO, Wellington Electricity Lines Limited ( <b>WELL</b> )
Contact	Scott Scrimgeour, Commercial and Regulatory Manager
Email	<a href="mailto:scott.scrimgeour@welectricity.co.nz">scott.scrimgeour@welectricity.co.nz</a>
Phone	021 107 1416

## 2 Introduction

Thank for the opportunity to participate in the *Issues Paper: Updating the Regulatory Settings for Distribution Networks* consultation. This submission will refer to the consultation document as 'The Paper'.

Electricity Distribution Businesses (EDBs) will need flexibility services to assist them to deliver the expected Emissions Reduction Plan (ERP) related increase in electricity demand and the rapid uptake of large Distributed Energy Resources (DER). The Paper, our own studies and other external papers proposing pathways to deliver the 2050 emissions reductions targets<sup>1</sup>, highlight the central roles flexibility services will have in spreading out the investment in new capacity, managing demand and supply uncertainty and helping to manage the size of customer bill increases. On the Wellington network, our initial estimates are that flexibility services could avoid \$200-300m in distribution network reinforcement. The value of the wider value stack<sup>2</sup> to Wellingtonians will be much greater.

More importantly, and what is not highlighted in the Paper, is the role that controllable DER and flexibility services will play in maintaining distribution network security. As part of our response to the May 2022 ERP, we have started to model and test the impact of connecting EV chargers and other devices to the network. Our studies are showing that these devices are much larger than what Low voltage (LV) networks in New Zealand have been designed to accommodate. The simultaneous operation of large DER risk causing networks to exceed their security limits. Currently, EDBs have no visibility of where these devices are connecting and have no way for ensuring that they will operate within the networks operating constraints.

<sup>1</sup><https://www.bcg.com/publications/2022/climate-change-in-new-zealand> and <https://www.transpower.co.nz/about-us/our-strategy>

<sup>2</sup> Shifting EV demand provides customers with a range of benefits generated from different parts of the electricity system. In most cases the benefits can be aggregated or 'stacked', rather than traded-off.

EDBs will not be able to meet their regulatory quality expectations if the connection and operation of these large DER are not managed.

There must be very strong incentives or mandatory rules to ensure that large DER are registered with a flexibility provider. It will also require the current hot water control hierarchy of needs included in DDA to be extended to all flexibility services. This would allow EDBs and the grid operators to call on flexibility services in emergencies. EDBs need to be able to rely on flexibility services to ensure the simultaneous use of these devices does not impact network security. Before we can consider the benefits from using flexibility services, we must first ensure the electricity network is secure and can provide a platform to build the new services on.

Alternatively, customers could choose to pay for building more network capacity to allow devices to be used freely and without management. However, this would be expensive and unnecessary – devices like EV chargers with long charge times that can be spread over long periods of time, can be managed with minimal impact on a customer<sup>3</sup>. This is also a long-term approach – in the short and medium term, we expect that EV growth will be faster than we are able to build new capacity.

The primary risk to the industry and customers is not that EDBs will not participate in flexibility services or they may favour their in-house services (as highlighted in the Executive Summary of the Paper) – the primary risk is that all of the building blocks needed to allow flexibility services to be offered at the scale necessary to provide a viable non-wire alternative, will not be in place. Our own EV Connect Roadmap<sup>4</sup>, and the FlexForum's Flexibility Plan 1.0<sup>5</sup>, provide key actions and deliverables that need to be implemented across the flexibility supply chain. Of those actions, there are eight early changes that must happen to facilitate the early development of flexibility services – early building blocks needed to allow the services to be developed to the scale needed.

The Paper identifies some of these changes but has missed others. The two most important actions that are missed is applying a hierarchy of needs to all flexibility services and considering how to ensure all large DER are registered to a flexibility provider.

1. **Co-coordinated implementation:** Our EV Connect programme identified industry leadership as a key driver for the development of flexibility services. The actions needed span the flexibility supply chain and require a co-ordinated approach. We believe the Authority are well placed to partner with the industry to provide the mandate and/or influence to make the regulatory changes needed.
2. **Understand consumer preferences for flexibility services:** For flexibility services to be developed to the scale needed to provide a viable wire alternative, customers must have smart device that can be remotely managed and be willing to participate in flexibility services. The industry must develop services that customers are comfortable participating in.

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<sup>3</sup> Concept Consulting: How New Zealand can accelerate the uptake of low emission vehicles Report 2: Consumer electricity supply arrangements 5 October 2021 ([www.concept.co.nz](http://www.concept.co.nz))

<sup>4</sup> <https://www.welectricity.co.nz/about-us/major-projects/ev-connect/>

<sup>5</sup> <https://www.araake.co.nz/projects/flexforum/>

3. **Implement an industry wide hierarchy of needs:** Network operators (EDBs and Transpower) have been able to maintain a secure electricity system by having priority access to hot water ripple control in emergency situations – emergency situations being when direct intervention is needed to ‘keep the lights on’. These are rare events that would have a limited impact on competing flexibility services. Currently the Electricity Code provides this capability for hot water ripple control via the DDA. EDBs can call on hot water assets managed by a retailer in an emergency situation, as can the grid operator. This capability needs expanding to devices managed by flexibility providers not currently captured in the code. This capability will ensure a stable and secure electricity system that flexibility services can be built on.
4. **EDBs to develop a LV management capability:** Forecasting where flexibility will be needed and incorporating flexibility services into their asset demand response. This will allow EDBs to identify network constraints and where flexibility services could be a viable wire alternative. LV Management systems combine spatial GIS data with ICP level consumption and power quality data to forecast demand and network capacity constraints. These systems are complex and will take time to develop. LV management is a precursor to Distribution System Operator capability.
5. **Streamline access to ICP level data:** EDB LV management systems require ICP data – without the data EDBs have no visibility of LV constraints or where they could use flexibility services. The provision of ICP data includes ensuring all privacy responsibilities are met.
6. **Ensuring DER are smart and are participating in flexibility services:** This includes ensuring all large DER are visible and registered with a flexibility provider – so that EDBs can ensure they are connected securely, and their continued operation remains within the network security limits.
7. **Flexibility provider tools that co-ordinate DER and aggregate a demand response:** Flexibility providers need to develop the capability to aggregate and co-ordinate the management of multiple DER. The tools must have common communication protocols that allow services to be co-ordinated with buyers.
8. **EDBs are funded to develop and purchase flexibility services:** EDBs are not funded to purchase flexibility services. They do not have opex allowances to purchase services and the IRIS mechanism does not allow opex/capex substitution if the deferred capex benefits span multiple regulatory periods. Until EDBs have regulatory allowances to purchase services, their use of flexibility services will be limited to small scale trials and tariff services. This is being discussed as part of the IM review.

As flexibility services mature and there are multiple buyers and sellers, EDBs will need to evolve their LV management capability to Distribution System Operator (DSO) function. At this point the Authority will need to consider what regulatory settings will be needed to support a DSO. As flexibility services are used more extensively and services are provided up and down the electricity system, their use will need to be co-ordinated so as to maintain the whole of system security. Central to this will be establishing a clear hierarchy of needs or services that the electricity system can use to prioritise and co-ordinate multiple purchasers/users of flexibility.

Note, we do not believe that whole of system co-ordination using a central controller of the end-to-end network, will allow networks to maintain accountability of their quality performance. Networks have regulatory quality targets applied under Part 4 of the Commerce Act 1986 (SAIDI and SAIFI targets) and power quality obligations under the Electricity Act and the Code (including ensuring that voltage remains within the 6% limits). EDBs must retain the ability to manage network security to meet their regulatory obligations they are accountable for.

We believe the Electricity Authority is in a unique position to either directly implement these changes or to oversee their execution. We ask that regardless of whether the EA are directly responsible to a specific aspect of the flexibility supply chain, that they participate in leading the implementation of flexibility services. As highlighted in our EV Connect Roadmap, an industry leadership group is needed to capture the supply chain wide actions. The leadership group needs the authority and mandate to action those changes – the EA can bring that mandate.

## 2.1 Submission form

This submission responses to the consultation questions. However, the consultation question numbers in consultation document are different in body of the document compared to the question summary provided in the Appendix. This document uses the questions from the body of the document, rather than the appendix, which appears to be missing a few questions.

## 3 Equal access to data and information

**Q1. Do you see value in commissioning two separate reviews to investigate the merit and practicalities of implementing the recommendations of the UK's Energy Data Taskforce around unlocking the value of customer actions and assets and delivering interoperability in a New Zealand setting?**

We agree with leveraging the work that has already been completed in the UK if it saves time and resources and speeds up the process of providing ICP level data to where it's needed.

Fundamentally, EDBs need to know what DER is connecting and how they intended to operate. ICP consumption data is needed, alongside voltage quality data and the DER location and operating details, to support EDBs to develop an LV management capability and to incorporate flexibility services into their demand management response – the capability to shift congestion to maintain voltage levels within prescribed limits. Standards setting out DER operating requirements will allow EDBs to manage how those DER will operate.

We think the scope of the studies should be expanded to include other aspects needed to support EDBs developing this capability:

1. **ICP data standard** – quality (voltage) ICP data does not have a quality standard and we have found the data is not to the same level of quality as consumption data in New Zealand. Australia have introduced a voltage quality standard that could be adopted in New Zealand. If EDBs rely on ICP



data to signal and manage capacity constraints, then that data must meet the minimum quality standard.

2. **DER asset standards** – as highlighted in the Paper, LV networks were not designed for the connection of large (above 2.5kW). The operation of these large new devices must be managed to ensure they operate within the networks operating limits – without this control, EDBs may not be able to meet their statutory voltage quality obligations. Assets Standards are needed to ensure large DE are registered and connected to a flexibility service so they can be managed to maintain security and reliability of the network.

Inverters need to lift voltage to inject energy into the network, impacting all connected customers and their equipment. Appropriate standards provided and applied at the time of connection should ensure inverters are programmed correctly to avoid any voltage issues.

3. **Dynamic connection agreement<sup>6</sup> details**– A register providing DER contractual terms about how DER operation can be varied, allowing the network to operate within a stable operating mode. This could include operating envelop (limits that the DER can operate within) or the understanding of a network or grid emergency where DER is curtailed so the network remains operating. This provides flexibility buyers with what large DER are registered and the operating limits of those devices. For EDBs this information is essential for network planning and incorporating flexibility services into a demand management response. This has been successfully used in Australia (Dynamic Templates model) for managing solar hosting within the LV network capacity.

Whether the Authority leverages the UK's Energy Data Taskforce recommendations or not, EDBs and other flexibility service participants need consumption and power quality data to manage the LV networks. EDBs also need to know the details and permissions of the DER participating in flexibility services. DER owners and flexibility providers need to know the prerequisite standards and policies for connecting and operating DER on a network. We support leveraging other jurisdictions work if it will result in a better and faster solution.

**Q2. Does this capture the key data needs for distributors to make informed business decisions that will unlock the potential of distributed energy resources (DER) for the long-term benefit of consumers? If not, what data is missing and what would it be used for?**

We generally agree that the key data needs have been captured. Additional comments include:

1. Quality data (voltage) is just as important as consumption data for managing LV constraints. We have found that the demand increase will cause the LV networks to exceed its voltage limits (low voltage) before its capacity limits.
2. Visibility of where DER are connecting and conformation that large DER has been registered (permissions) to be available to participate in flexibility services is also essential. EDBs must be able to manage the connection of DER to ensure the LV networks has mechanisms to move

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<sup>6</sup> The name for these types of agrees in Australia.

demand from time to time so that on-going operation continues to remain within the network operating limits.

**Q3. Do you agree with the prioritisation of the key data needs for distributors? If not, why not and how would you suggest the priority is changed?**

**Consumption and quality data**

We agree with giving priority to consumption and quality data.

Note, EDBs do not have funding to purchase this data or to develop the capability to collect, store and analyse the information. Purchasing a full data set is likely to cost over \$0.5m p.a. and the ongoing software costs to collect, store and analysis the data could be double this. Forecasting network constraints and managing the application of flexibility services requires development of a LV Advanced Distribution Management System (ADMS) which combines GIS spatial data with ICP level consumption and voltage data. In South Australia this capability cost approximately \$37m (\$4m p.a. in operating costs) and took five years to implement for the 900,000 connections they service. We expect that an ADMS deployment on the Wellington network will be less than this but will still be expensive. We are currently trialling ADMS software that will confirm the cost and delivery timeframe. Networks need the data now to develop the capability to manage the LV network and to incorporate flexibility services. The additional funding will not be available until April 2025 when the DPP4 price path takes affect (assuming the new price path includes these additional costs).

**Visibility of the location, size, and functionality of (non-exporting) DER**

**We do not agree with the ‘medium’ priority given to providing visibility of the location, size, and functionality of (non-exporting) DER.** This information is essential for EDBs to manage the secure connection of large DER. LV networks were not designed to accommodate additional large devices like EV chargers. EDBs need visibility of where these devices are being connected and the ability to managed their use away from peak congestion periods in emergency situations, so the network has the capacity to allow the device to operate and not affect existing customers quality of supply. EDBs need this visibility to maintain network security.

**Data quality standards**

Short term priority should also be given to ensuring the consumption and quality data are of a good standard – EDBs will need to rely on the data to ensure that the LV network continue to operate within the quality limits.

We believe that the consumption data can be relied on because it is already used extensively in various billing and reconciliation processes – checks and quality checks already exist to ensure the data is correct.,

Quality data is not currently provided to a defined standard and does not have the same level of rigor applied to ensure its accuracy. We would encourage the application of a data quality standard like that used in Australia.



### **Near real time and more detailed quality data**

We agree with the prioritisation of other data types. Flexibility services will need to evolve before more complex quality data and real time information is needed. To ensure stability of LV networks, Australian lines businesses are moving to five min, near real time, data to ensure they can shift the DER (orchestrate) to maintain LV quality standards.

#### **Q4. Does this capture the key data needs for flexibility traders to make informed business decisions that will unlock the potential of DER for the long-term benefit of consumers? If not, what is missing and what would the data be used for?**

We strongly support making data available to flexibility providers to enable them to develop innovative products and services for flexibility buyers.

However, the capability needed to map current LV congestion and forecast future congestion will take time to develop and EDBs may not have this capability within the 1-3 year timeframe. To provide a meaningful static congestion map an EDB must develop a LV management capacity - specialised software that combines GIS spatial data with ICP consumption and quality data. Networks will not be funded to provide this before April 2025 and will require Commerce Commission approval.

Prioritisation of data to flexibility providers must align with EDBs being able to provide the information. Further work is required to develop the process and market for flexibility service providers, data being a component of the solution rather than the solution in itself.

#### **Q5. Do you agree with the prioritisation of the key data needs for flexibility traders? If not, why not?**

As above – the timings of the prioritisation must take into account the ability of other parties to provide that information and the prioritisation of the data being provided to them. [

#### **Q6. Do you agree that the Authority should amend the Data Template to address the above issues to improve its workability? If not, why not?**

Yes, the Authority should amend the Data Template as described. Consideration should also be given to how to transition those already on the existing agreement to the new terms.

Expanding the ability to charge networks for the reasonable cost of providing the data, to the provision of quality data will be important. Customers are already paying for the collection of ICP data – its important that they do not pay twice and that only the incremental cost of providing the data to EDBs is charged.

It would be useful if the Authority could provide MEPs and the industry with guidance of what a reasonable incremental cost could include.



**Q7. Are there other changes to the Data Template that would improve it and assist it to be a useful mechanism for open access to data?**

Consideration needs to be given to data quality – specifically the quality of voltage data. We believe a framework needs to be developed to ensure that the data being purchased is accurate and can be relied on for planning and operational decision making.

Networks will also need the funding to purchase the data and to develop the systems needed to collect, store and use the information. The current cost per ICP is not trivial and networks will have to consider whether to delay developing the LV management capability until after April 2025 (when new allowances should be provided) or what to trade-off to purchase the information and to develop the systems before 2025. Our sister company South Australia Power Networks took five years to develop an ADMS to manage the LV network and incorporate flexibility services.

**Q8. Do you agree that this is an issue? If not, why not?**

While the industry has developed work arounds to this issue, a more enduring solution is needed. We support the proposed approach (the approach is obvious and sensible).

**Q9. Should the Authority amend the Code to clarify that MEPs can contract directly and provide both ICP data to distributors (and flexibility traders) for permitted purposes? If not, why not?**

Yes, as above. The intended end result is for EDBs to have both consumption and power quality data and this data should be provided in the most efficient way. Privacy Act obligations and data use expectations can be included in the Code/Data agreement.

Separate processes for consumption and power quality data and a requirement for retailers to each act as an intermediary adds unnecessary complexity and cost. We have 27 retailers providing services on the Wellington network. The direct provision of data from the MEPs also avoids the complexity of customer switching between retailers and retailers exiting and entering the market.

**Q10. Should the DDA Data Template be updated to include Power Quality Data? If not, why not?**

Power quality data (specifically voltage data) is as important for forecasting the impact of DER uptake and managing their impact on customers voltage quality. Voltage quality data is essential for forecasting when flexibility services could be needed to correct under voltage conditions ahead of network capacity investment. While managing congestion on the LV network using consumption data has some benefit, it is power quality data which more accurately determines the impact on customers. The data template should be updated to include the provision of power quality data.

The data agreement should also cater for more complex power quality data. However, networks may not need all types of power quality data immediately. If including more complex power data in the agreement delays the agreements development, the provision of this data could be included at a later date. The priority should be given to providing consumption and voltage data.

Voltage data also provides the ability for EDBs to predict neutral connection integrity helping to ensure a customer's safety.

**Q11. Do you think that the transaction costs associated with negotiating access to MEPs is a problem that the Authority should prioritise? If no, why not? If yes, do you think there is merit in developing a template to develop a default template to help reduce transaction costs?**

We do not believe the transaction costs of developing MEP terms would be as high as they were for developing the DDA data agreement as there are far fewer MEPs.

We do believe that a standard set of terms would be useful:

- A single negotiation of terms would be more efficient and less costly than multiple individual negotiations between each EDB and each meter provider.
- Provide consistent terms across all meter providers for terms relating to the types of data provided and the level of data quality expected.
- Ensure data privacy obligations are consistently and appropriately captured.

**Q12. Do you agree that MEP pricing for ICP data (including Power Quality Data) and related data services is reasonable at this stage? If not, why not?**

Ultimately the cost of providing data will be passed through to customers, so we need to consider whether this an efficient method for data distribution. We think it would be worth testing whether it's more efficient for the data to be managed and distributed centrally rather than individually to each EDB.

We are currently being offered an ICP price for purchasing data – a unit price for providing the data monthly for a year. We would expect that for the price to provide the data to be reasonable, that it would reflect the incremental cost of providing that information.

We would also expect the reasonable cost to be a function of the volume of customers that cost is being recovered from i.e. there will be a large fixed cost element to providing the data and we would expect the unit price of providing the data would reduce as the number of ICPs the data is being provided for increases.

However, EDBs do not have visibility about what the incremental cost is or whether non-incremental costs are included (costs that an MEP would incur as part of their other services). EDBs also have no visibility of the volume of ICP data the costs are being spread over.

We cannot say whether the costs are reasonable or not.

More importantly, EDBs do not have the funding to purchase the data. We expect (from earlier conversations with our meter provider) that we will need \$0.5m p.a. to purchase consumption and quality data. This is the equivalent of 1.6% of our total opex allowance or three to four staff members.



**Q13. Do you agree that MEP pricing for the provision of ICP Data to distributors (and other parties) could be more transparent? If not, why not?**

For an EDB or the Authority to judge whether prices are reasonable, more transparency is needed. As highlighted in the Paper, MEPs are providing data from a monopoly position and it's important that customers have confidence they are not indirectly paying for the provision of data twice (one through their retailer and again via distribution charges).

Improved transparency will also assist EDBs in securing regulatory funding to purchase the data.

**Q14. To support the transparency of pricing, standardisation, and equal access to data, do you think that the Authority should consider further implementing IPAG's Input Services recommendation that MEPs publish standard 'pay-as-you-go' terms open to all parties? If yes, why and what do you think this could cover? If not, why not?**

We support requiring MEPs to publish standard 'pay-as-you-go' terms to:

- Ensure a consistent and reasonable application of a 'reasonable cost' for the data is applied.
- Streamline the step change process in the Commissions EDB allowance calculation to fund the provision of the data.

We also believe that it is important that the MEP provide enough transparency to show that the prices are reasonable. We believe that an information disclosure requirement, like that of other monopoly services, should be required. The information disclosure requirements should focus on:

- Demonstrating that only the incremental cost of providing the data is included in the prices.
- That the total revenue collected from prices is aligned with the overall incremental cost (demonstrating that prices also reflect the volumes the costs are being recovered from).

We would also support a standard for mat for providing data, like the EIEP formats used at present.

**Q15. Do you agree that distributors' visibility of the location, size, and functionality of DER needs to be improved within the next 3–7 years to support network planning? If not, why not? (**

As addressed in our response to question three about the prioritisation of data, short term prioritisation should be given to the provision of the location, size, and functionality of DER. Visibility and information about DER wanting to connect to the network (both in front or behind a meter) is just as important as consumption and quality data. Regulation is needed to ensure EDBs have visibility of DER and details about flexibility services they are registered too. Consumption and quality data provide inputs that allow an EDB to assess and identify available network capacity and potential constraints to inform where flexibility service might be needed. Information about DER wanting to connect allows networks to assess whether that device can connect and operate within the available capacity. Both are needed to manage network security.

As highlighted in the introduction to this submission, EDBs need more than large DER visibility – they also need to be able to manage the connection process (test whether a device can be securely connected) and



the ongoing operation by having access to services that allows the management of large DER to ensure their use remains within the defined network security and voltage quality limits.

**Q16. Do you have any views on the type and size of DER that needs more visibility?**

Networks need visibility of all DER that are larger than the LV networks were designed to accommodate. Our current view is that DER over 2.5 kW would impact LV network security once penetration levels reached 50% of ICP's. We will continue to trail and test the impact of DER to refine at what size DER need to be registered to a flexibility service.

We believe that it should also be mandatory for these large devices to be registered so they are participating in a flexibility service and can be directly managed in emergency situations. LV networks will not have the capacity to accommodate the simultaneous operation of many of these larger DER at the same time – having the ability to curtail the operation of large DER would allow customers to use their devices while still maintaining the security of the network for other users.

**Q17. The Authority acknowledges that definitions of 'real-time' vary, please explain what real-time data means to you.**

Real time will depend on the service being used and a single definition may not be appropriate. We do not have an affirm view of what then definition should be.

Real time for an EDB relates to SCADA operations which has a latency of 6 seconds between data polls and only reports on status changes. Providing data in real time (providing a data point even if there has been no change) could create data sets that would be too large for flexibility services to manage.

Near 'real-time' measures might be more useful for flexibility services i.e. no more than a 5-minute lag between the reading being taken by the meter and the measurement being reported or available to the EDB is more appropriate.

**Q18. Do you agree that access to 'real-time' consumption and Power Quality Data won't be needed for at least five years?**

Yes, this is our current view and expectation that simple flexibility services that use static data will be developed first before evolving into more complex responses using real-time data.

**Q19. Do you agree that flexibility traders' access to ICP data must be improved so they have the same level of access as distributors (and retailers), with whom they might be competing to provide contestable services? If not, why not?**

This is a difficult question. Access to ICP data could be an important input to allow flexibility providers to develop products that customers will want to participate in. We assume that access to data will help the development of new innovative services and will promote and develop a competitive flexibility market. The industry needs high participation in flexibility services to deliver the benefits highlighted in the Paper and access to data will help the development of this capability.



We also assume that equal access to data would also allow new start-up flexibility providers to develop products that can compete with retailers who also offer flexibility services and already have access to the data – equal data access will help avoid the competitive advantage of a market incumbent having better information.

However, data should only be provided where a customer has consented – consent is provided by customer/retailer agreement and is passed to EDBs by the DDA. Incumbent retailers who will offer flexibility services will have access to data. Start-up flexibility providers will not – they will have to get customer consent which could be difficult.

Consideration should be given to ways of providing start-up flexibility providers with the data they need to develop innovative products. This could be by providing using anonymised data sets or by a global consenting (discussed later in the Paper).

**Q20. Do you think the Authority should prioritise modifying the Data Template, so that flexibility traders can use it, or should the Authority prioritise amending the Code to clarify that MEPs must provide ICP data directly to flexibility traders and distributors for a set of permitted purposes without the need for retailer permission? If neither, please explain why.**

We would support code changes to allow the provision of data to flexibility providers if the data was needed to support the provision of flexibility services (we don't agree with access to customer data if it's not needed) and could be provided with customer consent and that data privacy responsibilities are also assigned to flexibility providers.

The DDA data template may not be the right vehicle for these terms as the DDA is an agreement between retailers and EDBs.

The Authorities legal team will be in the best position to decide what the best mechanism is for providing data to flexibility providers.

**Q21. Do you agree that flexibility traders need access to granular current and likely future Congestion Data on distribution networks within the next 1–3 years?**

As highlighted in our response to question 4, the capability needed to map current LV congestion and forecast future congestion will take time and additional regulatory funding to develop and EDBs may not have this capability within the 1-3 year timeframe. The additional funding is being included in this year's AMP that will be used to inform the funding for the next regulatory period starting April 2025.

To provide a meaningful static congestion map an EDB must first have ICP level data to provide the current network status (both the network capacity and power quality). An EDB then needs visibility of DER locations (EDBs currently only have the location of solar installations) to forecast their impact of available capacity. Specialised ADMS software is then needed to combine the ICP and DER location data with spatial GIS data to provide the tools to forecast capacity constraints and model the impact of using flexibility services as a demand management response. Experience from our sister company shows this is a five year development

process and a significant investment (as outlined in our response to question 3). Networks will not be funded to provide this before April 2025.

We do agree that heat maps of network congestion could provide useful tools to help promote flexibility services and provide guidance to where networks might call on flexibility services. However, this type of map should only be used for high level guidance. An EDB will consider many other factors that won't be included on the map when considering whether to use flexibility services:

- The impact of other demand management tools available to a network operator. A network operator may be using hot water control or back feeding from other parts of the network.
- It may be more efficient to build traditional capacity at the same time as aging assets are being replaced. We are about to start replacing our two largest assets fleets. This is providing us the opportunity to add additional capacity for a small incremental cost.
- Rapid ERP related demand growth means that an EDB is not confident that a flexibility service will be able to shift enough energy use to off peak periods or the network will run out of off-peak capacity.
- An EDB is not confident that flexibility services will be effective enough to maintain network security. EDBs can be fined up to \$5m if they breach their quality standards.
- The market price for offering flexibility services maybe higher than the cost of reinforcing the network.
- New capacity may be needed sooner than what a flexibility service can offset.
- Meaningful heatmaps also become difficult for mesh networks where electricity can be provided from multiple directions, solving capacity constraints.

An EDB will assess what flexibility services are needed as part of their overall network management plans and will calculate the price at which those services can be offered, a price which reflects the network investment that can be deferred and other benefits that the service provides. However, this requires EDBs to have developed the ADMS capability described above which will take time and funding to develop.

The focus should be on EDBs calling for flexibility services where they have calculated the services will be needed. EDBs are responsible for managing network capacity and quality of supply and will need to decide where to use flexibility services (once they have developed the ADMS capacity to make this assessment). Third parties risk wasting resources by proactively approaching EDBs with offers to provide flexibility services to specific network constraints, independent of advice from EDBs.

**Q22. Are there any other issues preventing distributors from providing granular current and likely future congestion data?**

It is important that the Authority does not underestimate the development needed for an EDB to provide a LV level congestion map – our sister companies in Australia (United Energy Network and South Australia Power Network) have been developing LV management capacity using Future Grid software for the last five years. They are now at the point that they can model congestion on the LV network but it has taken a long time to develop.

It is also important for the Authority not to overvalue the importance of congestion maps. They are a valuable tool for promoting flexibility services while the viability of a non-wire response is considered. However,



congestion alone is not an indication that flexibility will be required. EDBs will need to call where flexibility services are needed and potentially indicate the price at which they are willing to purchase services.

A more important capability will be for EDBs to develop LV Management capacity which is needed to model and forecast where voltage quality limits will be exceeded. This provides the tool to assist EDBs in deciding whether demand management tools or flexibility services should be applied, whether traditional wire solutions are more appropriate or a combination - whether flexibility could be used to delay an investment or reduce the capacity of an investment. As important will be the development of commercial and economic frameworks to assess when flexibility becomes a viable alternative to traditional wire solutions and at what the breakeven price is (the price at which traditional wire solutions are a more efficient solution).

We are about to start a trial of the FutureGrid LV management software. The trial will be used to inform a LV management development plan and budget. We will be in a better position to answer this question once the development plan is completed.

**Q23. Do you agree that visibility of the location, size, and functionality of larger DER needs to be improved within the next 3–7 years to help understand the drivers of network congestion, what DER is ‘controllable’, and what services could be offered to owners of DER? If not, why not?**

As stated earlier – this information is an essential building block for the provision of flexibility services and should be a priority change (a short-term priority).

EDBs need visibility of location, size, and functionality of larger DER to assist the connection process (ensuring the devices can be security connected).

Flexibility providers need this information to ensure high DER participation rates in flexibility services. An additional essential building block is to ensure that large DER are controllable and registered to a flexibility service. A registry will be an important tool for ensuring this has happened. Visibility of these devices will enable flexibility providers to build an aggregated flexibility services at the scale needed to offer EDBs a viable wire alternative. This in turn will allow EDBs to ensure that the combined demand of large DER remains within the network security limits and quality levels are maintained for all electricity users.

**Q24. Do you have any views on the type and size of DER that flexibility needs to have improved visibility?**

LV networks are not designed to host additional devices over 2.5kW (most homes have 10A plugs). Large DER should be registered and able to participate in a flexibility service to ensure network security.

Ideally all DER also need to apply to connect to a network (unlike the current PV application process this should be automated and would include checks to ensure they can be security connected) so networks have visibility of where devices are connecting, and the capacity constraints can be assessed.

Alternatively, customers could choose to pay for building more network capacity to allow devices to be used freely and without registration. However, this would be expensive and unnecessary – devices like EV chargers with long charge times that can be spread over long periods of time, can be managed with minimal impact on a customer.



**Q25. Do you think that the Authority, instead of a DER registry, should consider amending the registry data fields and / or requirements to improve DER visibility?**

The Authority is in the best position to judge the most efficient and effective way of providing this information. Expanding the existing registry seems the most efficient way but we do not understand the intricacies of doing this.

We do note the additional requirement of all DER applying to connect so that an EDB can assess the impact on a network's capacity (an automated process as described above). The registry may not be the most appropriate tools for incorporating an application function with this capability.

**Q26. Do you agree that the Authority should prioritise work on addressing the other issues outlined in this paper?**

As highlighted in the introduction of this paper – providing visibility on the location, size, and functionality of large DER is an essential building block and should be made a short-term priority. This includes supporting regulation to allow an application process for large DER wanting to connect to a network.

Without this information EDBs cannot security connect large DER and flexibility providers do not know where large DER are located so they can register them to a flexibility services. This information is essential for ensuring a secure electricity network.

**Q27. Do you agree that flexibility trader access to real-time congestion and ICP data won't be needed for at least five years?**

Flexibility services are developing rapidly so it is difficult to judge when flexibility traders will need real time data. If flexibility provides do need real time data, consideration should also be given to the best source of that data. It maybe that DER devices provide a better source and flexibility traders would already have access to that data.

**Q28. Do you agree that model privacy disclosure terms are appropriate?**

We agree with the Authority's proposal to develop model privacy disclosure terms for ICP data.

**Q29. Do you agree that model privacy disclosure terms would facilitate data access?**

Yes, it is important that customers understand how their data is being used. If data is being used in new ways (like what is being proposed) then customers need to understand what is changing. It would also be useful if the Authority could accompany the disclosures with customer information on how sharing the data with others in the electricity supply chain will benefit them.

This could also provide an important step in providing start-up flexibility providers with data needed to develop innovative flexibility services.

**Q30. Do you see any practical issues with this proposal?**

Not that we are aware of.



**Q31. Should the Authority create model terms for distributors and MEPs as well given the range of data being collected through smart meters? If not, why not?**

Yes, developing similar terms for distributors and MEPs would provide consistency in the messaging for customers.

**Q32. Would the industry find it helpful for the Authority to conduct workshops on privacy preserving/minimisation techniques?**

Yes, EDBs have not traditionally managed large customer data sets and a workshop on privacy preserving/minimisation techniques would be useful.

We are looking to work with Australian software developers which have data anonymisation tools which store data in a form which has no personal information and then reconstructs the data when personal data is needed, subject to security clearances. We see this as an interesting development the Authority may wish to consider further.

## 4 Market settings for equal access

Note questions numbers 31 and 32 are repeated in the body of the consultation text.

**Q31. What are your views on the three options presented above, to deal with Issue 1 (that distributors might prefer network investments to NNS)? What alternative option/s would you favour, if any?**

The development of flexibility services is still in its infancy so care should be taken to not apply unnecessary administration and cost burdens on networks. Flexibility services are not at the scale needed to be offered as a viable wire alternative and EDBs are not at the point they can use flexibility services as a standard demand response. Specifically:

- EDBs are still developing the LV management capability to identify and value when NNS would be a viable wire alternative. As discussed earlier, this is a significant development process that will take time and additional funding.
- EDBs are not funded to purchase flexibility services. They do not have opex allowances to purchase services and the IRIS mechanism does not allow opex/capex substitution if the deferred capex benefits span multiple regulatory periods. This is being discussed as part of the IM review. However, any new regulatory allowances won't be available until after April 2025.
- EDB's have limited funding for innovation and for the development of the new capability needed to incorporate flexibility services. Currently, regulatory allowances only provide a small allowance for innovation - for up to 50% of the total cost of approved innovative projects in the assessment period, but not exceeding 0.1% of the total allowance in the regulatory period. The fund is too small to support the level of investment needed to trial and introduce new demand management technology and the development of flexibility services with flexibility providers. EDBs are currently funding the development of flexibility services from other innovations funds, cost savings, profits or from stopping other activities.



- A flexibility market does not yet exist at the scale needed to provide a viable wire alternative – while the services are developing rapidly, most DER are not smart and are not participating in a flexibility service.

Regulatory support should therefore focus on supporting the development of the services and EDBs ability to use the service, rather than regulating the use of those services.

We agree with the Authority's assessment with option 1. EDBs are aware of the need for flexibility services and further education would have little value.

We think the best option is option 2. EDBs are not funded to trial and develop flexibility services. Without funding, EDBs cannot in turn fund start-up flexibility providers to develop and trial services.

We do not support option 3 – flexibility services have not been developed to the point that they can form part of an EDBs standard demand response. An assessment requirement at this early stage of development would simply be a cost burden. Even if a network demonstrated that flexibility services would be a viable option, they do not have the funding to purchase the service. We do think that this will be an important disclosure in the future to show that EDBs are providing an efficient service.

**Q32. Do you agree with the tentatively preferred intervention to deal with Issue 2 (Option 3: encourage standing offers) and the collection and monitoring of information proposed under Option 4? If not, what alternative option/s would you favour, if any?**

Yes, we agree that a standing offer provides a simple first step to develop a market for flexibility services. It would also enable EDBs to consider all of other factors (see our response to question 21) that an EDB needs to consider when considering whether to use flexibility services.

It would be important that the standing offer is accompanied with the prerequisites that need to be in place for that offer to apply. This includes visibility and performance of a DER participating and confirmation it is registered and has permission to participate.

Networks would need to consider how a standing offer co-ordinates with their tariff price signals. Our current thinking is that we will use tariff peak demand price signals to reflect an enduring long run marginal cost for the overall network – a signal to encourage a general behavioural change to shifting electricity use to off peak periods. We would then offer targeted flexibility services for specific network constraints on top of the traffic peak demand price signal. The higher value 'standing offer' type of price signal would reflect the value of deferring investment to solve that specific constraint. We are currently developing a commercial framework based on this concept with Orion as part of our residential flexibility services trial (Resi-Flex). We will be sharing the findings via the FlexForum.

This type of mechanism relies on EDBs being funded to purchase these services – either by direct opex allowances or by substituting capex spend. The current regulatory model provides neither of these funding avenues. This is an important change that is being discussed as part of the IM review with the Commission.

We would support the collection and monitoring of information as a way of measuring progress on the development of flexibility services. However, care must be taken not to overburden EDBs with reporting

before flexibility services are developed to the point they form a part of an EDBs 'business as usual' demand management.

Option 2 is not a viable option to address the issue identified.

However, we do support the development of multiple trader relationships. The Kāinga Ora peer to peer trial provides a good example of the types of new services that customers now want. This project also provides a good example of where a streamlined regulatory sandbox or exception process proves would help enable the development of innovative new products. At the moment the process for applying for exceptions to the regulatory setting to test new ideas and concepts, is resource intensive and takes a long time. We would encourage the Authority to consider a streamline exception process to encourage innovative thinking and product development.

**Q33. Do you think there are circumstances in which the Authority should extend the arm's length rules? If not, why not?**

In general we agree that EDBs should not participate in providing flexibility services for the reasons outlined in The Paper (the key reasons being that EDBs would block the rest of the flexibility service value stack). This comes with the assumption that all flexibility services operate under a common hierarchy of needs that allow EDBs and the grid operator to call on services in emergency situations – emergency situations being when direct intervention is needed to 'keep the lights on'. These would be rare events that would have a limited impact on competing flexibility services.

This also assumes that EDBs can maintain the existing hot water control capability. Distribution networks and the national grid have been designed to include the existing hot water ripple control demand management capability. This capability must be maintained for networks to continue to provide existing levels of supply security.

The flexibility service that the Authority could consider allowing EDBs to provide directly is for a network battery that could be moved around a network as an emergency response or to temporarily top up or support a third-party flexibility response – similar to a network using diesel generation.

**Q34. Do you agree with the Authority that Option 1 should be implemented, and that Option 2 could be considered in the event of allegations of, or instances of anti-competitive harm in contestable markets (Issue 3)? If not, what alternative option/s would you favour, if any?**

We agree with the Authority's general assessment of this issue – that's its not a material issue. As such, we would support using the regulatory related party disclosures to monitor EDBs direct participation in offering flexibility services.

In the meantime, existing anti-competition laws could be relied on.



## 5 Capability and Capacity

### **Q35. What do you think of the Authority's option of using the education option proposed elsewhere in this paper, to include some guidance on how distributors should collaborate in future?**

We believe the issue of resourcing and securing materials ahead of the step change in new ERP related investment will be a key issue and challenge for the industry going forward. We are forecasting our investment programme to double and to be sustained at that level for the next 20 years. This increase in investment will be at the same time as other networks, the grid operator and other infrastructure providers (like water) will also be looking for additional delivery resource.

We believe that it will be essential for the industry to co-ordinate resources between work programmes and to consider pooling our procurement programmes to help secure equipment supply channels.

EDBs understand the opportunities to collaborate and have an association (ENA) who co-ordinates this collaboration. We see little value in this option.

### **Q36. Do you think it would be helpful for the Authority to encourage the use of joint ventures between distributors to increase their integration of DER and their procurement of NNS projects? And should this be combined with the first option?**

As above, EDBs are already co-ordinating in the development of the capability to integrate flexibility. EDBs understand what needs to be done and there would be little value in the Authority 'encouraging' more collaboration. Examples of where we are collaborating with other work programmes and the electricity industry to develop flexibility services are:

- Developed our EV Connect Roadmap with the industry (52 industry participants) - developing the steps and actions needed to develop flexibility services.
- Resi-Flex programme with Orion – developing user requirements and a commercial model for residential flexibility services. This will be used to develop and trial residential flexibility services.
- Ara Ake EDB challenge – working with Powerco to trial The FutureGrid LV management software
- Participating in the FlexForum industry workgroup which is co-ordinating the development of flexibility services.
- Boston Consulting Groups 'Future is Electric' which developed industry paths ways for delivering New Zealand's emissions reductions targets.

An capability we would like to consider and test is the use of the central platform that DER are registered to – the platform would act as a central market place managing the buying and selling of flexibility services and providing oversight of how demand is being managed. In Australia, platform operators are providing services across 20,000 connections which manage 100MW of demand response. A similar platform in New Zealand could provide an opportunity to centralise some of these services across a number of networks.



## 6 Operating agreements for flexibility services

**Q37. Do you agree with the proposed approach to monitor progress between Transpower and distributors in developing standard offer forms for procuring NNS, and monitor whether issues associated with operating agreements for flexibility services are developing, and prioritise resource to progressing the other chapters? If not, why not?**

### Hierarchy of needs

While we agree that a template agreement is not required at this early stage, we do think it's essential that the Authority apply a hierarchy of needs framework for flexibility services in the code – a framework that allows EDBs and the grid operator to call on services in emergency situations – emergency situations being when direct intervention is needed to 'keep the lights on'. These would be rare events that would have a limited impact on competing flexibility services.

Currently the code provides this capability for hot water ripple control via the DDA. EDBs can call on hot water assets managed by a retailer in an emergency situation, as can the grid operator. This capability needs expanding to devices managed by flexibility providers not currently captured in the code. This capability is essential for ensuring that networks continue to provide a secure electricity supply.

Consideration needs to also be given to how security is managed across the electricity system. This includes ensuring that the grid and other flexibility buyers use of flexibility services on the distribution network, doesn't adversely impact a distributors quality of supply.

Careful consideration needs to be given how this is achieved. We do not believe that whole of system co-ordination using a central controller of the end-to-end network, will allow networks to maintain accountability of their quality performance. Networks have regulatory quality targets applied under Part 4 of the Commerce Act 1986 (SAIDI and SAIFI targets) and power quality obligations under the Electricity Act and the Code (including ensuring that voltage remains within the 6% limits). EDBs must retain the ability to manage network security to meet their regulatory obligations they are accountable for.

Having an independent platform operator (which the DER registers to and has operability with) would be a useful construct to provide information and transparency on how the demand is being managed under the hierarchy of controls agreed between the market participants. The independent platform could act as a central marketplace that manages the interaction of flexibility buyers and sellers.

**Q38. Do you have any views on the best way the Authority can monitor whether issues associated with operating agreements for flexibility services are developing?**

We do not believe the Authority need a formal monitoring framework. Industry participants will inform the Authority if there are any material issues.

**Q39. Do you have any suggestions for how the Authority can support industry-led work on providing guidance on best practice and templates for operating agreements?**

The development of commercial agreements should be left to the industry and industry forums, like the FlexiForum, to develop.

## **7 DER Standards**

**Q40. What are your thoughts on the proposed scope for the Part 6 review? What, if anything, would you include or exclude, and why?**

We generally agree with the proposed scope for Part 6 review described in the issues paper since the existing Part 6 has become unsuitable for the current environment. The details are discussed in the questions below.

**Q41. In order, what are the three most important issues that should be addressed as part of a Part 6 review, and why?**

1. Review of application requirement / process for large DGs to provide clear and better definition on the DG requirement and criteria. There are a few loopholes that need to be closed.
2. Inclusion of DER – this needs to be done on the basis that it doesn't discourage the uptake of flexibility market. EDBs need visibility of where DER are connecting to ensure they can connect securely.
3. Review of the prescribed maximum fee limits as the existing values do not reflect assessment costs.

**Q42. What are your thoughts on amending Part 6 to explicitly include DER, and what do you think are the key issues to be considered?**

We agree with including rules to manage the connection of DER in the Code but we do not agree with explicitly including DER in Part 6. DER operate very differently to DR and will need their own set of standards and rules. We agree that DER need to be included in the Code (like DR is) but will need its own rule set. This will also require the inclusion of flexibility providers into the electricity Code.

**Q43. What are your thoughts on increasing the size threshold for Part 1 DG applications, including the benefits and drawbacks?**

We agree with increasing the threshold as long as the process timeframe can be extended accordingly due to the increase of potential workload.

**Q44. If the threshold were to change, what do you think the new threshold should be and why?**

We are happy with changing the threshold to 20 kW or 30 kW for the Part 1 applications on the basis of application time frames extended and requirement definitions are improved.



**Q45: What are your thoughts on adjusting the ten-business day timeframe in Part 1A?**

We suggest increasing the approval timeframe to 20 business days.

**Q46. What are your thoughts on maintaining the current approval timeframes in Part 1 (comprehensive) and Part 2?**

We consider the current timeframes are appropriate for Part 1 and Part 2.

**Q47. If you seek a change to approval timeframes, what evidence can you give to support this?**

WELL does not seek a change in the approval timeframes.

**Q48. What are your thoughts on adding a new DG application process for largescale DG to Part 6? Please provide examples in support of why you think change is or is not necessary.**

The current structure and framework set in Part 2 are appropriate for larger DG application. However, the requirements for the larger DG application will have to be well defined and fit for purpose.

**Q49. If you think a new application process should be added, where should the threshold be and why?**

1MW is an appropriate threshold for the larger DG application since this size also align with the requirement of providing DG information to System Operator as per Part 8 of the Code.

**Q50. What are your thoughts on reviewing the priority of applications clause in Part 6?**

WELL supports a comprehensive review of application priority, queuing and capacity reservation components of Part 6.

**Q51. Should the AS/NZS 4777.2:2020 Standard be mandated for inverters in New Zealand? If so, how should this be accomplished?**

WELL supports mandating AS/NZS 4777.2:2020 for inverters in NZ in Part 6, since we believe that the benefit mentioned in the issue report can be materialised and it will provide an equitable outcome for customers.

The Authority should liaise with Electrical Worker Registration Board to ensure electrical inspectors and electricians adhere to the rules set in the standards. DG applications should include the Certificate of Suitability for the inverter as part of the application requirement.

**Q52. What are your thoughts on the Authority reviewing the prescribed maximum fees in Part 6?**

We support reviewing the prescribed maximum fees in part 6 in order to reflect the current resource costs, and the increase in complexity and workload.



## 8 Closing

Thank you again for the opportunity to provide a submission to The Paper. The Paper highlights the advantages that flexibility services will provide and has identified many of the prerequisites and changes that are needed to facilitate the develop of these services.

A key action not identified in the Paper is providing very strong incentives or mandatory rules to ensure that large DER are registered with a platform so that flexibility providers can access DER to offer services. LV networks in New Zealand are not designed for high penetration rates of large DER. EDBs need to be able to purchase services to ensure the simultaneous use of these devices does not impact network security. Before we can consider the benefits from using flexibility services, we must first ensure the electricity network is secure and can provide a platform to build the new services on. This will require EDBs build a LV management capability to identify where flexibility services are needed. This In turn requires ICP level data and visibility of where DER rare connecting.

Other key changes not identified in the paper is ensuring DER are smart (visible, registered and managed) and can participate in flexibility services and ensuring EDBs have funding to purchase services. While these actions are not the direct responsibility of the Authority, we ask that the authority use their influence to facilitate these changes – without these changes, flexibility services will not become a viable wire alternative.

Our submission has highlighted the need to prioritise some of the actions (especially providing the location, and capability of DER) and questions whether the value of congestions maps is being over emphasised as congestion is just one of the many factors EDBs will consider when assessing whether flexibility services will offer a viable wire alternative. We also believe the submission underestimates the complexity of developing a LV management capability and we believe it will take longer than the three-year priority for providing congestion maps (an output of an LV management system).

We encourage the Authority to become more involved with the FlexForum. Co-ordinating the many actions needed to develop flexibility services is difficult and the forum would benefit from additional resources and a regulatory mandate to make the changes needed.

