

# Northern Energy Group

submission to the Electricity Authority

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Northpower





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## EXECUTIVE SUMMARY

We welcome the opportunity to provide a submission to *Te Mana Hiko / the Electricity Authority* (EA) on the discussion document *Updating the Regulatory Settings for Distribution Networks: Improving competition and supporting a low emissions economy*.

We strongly support the government's commitment to a low emissions economy and consider that the energy system will play a fundamental role in achieving this. A large part of the transition will involve decarbonising our transport system and, as this becomes further electrified, transport will become increasingly integrated and inter-dependent on electricity distribution businesses (EDBs) distribution networks. We agree with the EA's objective, *"to promote competition in, reliable supply by, and efficient operation of, the electricity industry for the long-term benefit of consumers."*

We encourage New Zealand to take learnings from international experience, in particular to ensure regulatory settings for distribution networks enable us to maximise the benefits of distributed energy resources (DER) and strengthen the overall resilience of our energy sector. We have an opportunity now to take a future-focussed, no regrets approach and lay the foundations for smart, integrated, and resilient distribution networks in New Zealand. For example, we can already see key policy approaches emerging for transport that will impact the energy sector, such as the Clean Car Discount.

As a group of EDBs that are entirely or majority owned by customer trusts, we are taking collective action now. We are thinking about the issues and taking a principles-based approach to developing solutions. We are collaborating with each other and other industry participants to ensure that all our consumers benefit from the changes in technology and innovation happening across our networks. Our local ownership structures drive investments for our communities, supporting broader regional economic development.

Establishing the right foundations is fundamental to set the pace and direction toward New Zealand's low emissions economy. We encourage the EA to work in partnership with EDBs and establish these foundations through standards and regulations development.

Greater visibility on power flows and hosting capacity is urgently required to enable more efficient network planning and operations, improved investment decisions and support the integration of DER. Current challenges for accessing network and consumption data are increasing risks related to network maintenance, safety, and affordability. We recommend continued collaboration between industry participants and more consistency across reporting of information. A repository for sharing data is essential, and we recommend the use of an application programming interface to achieve this.



There is a lack of electricity supply standards for some key technology, and other standards are out of date. This creates issues related to the connection and operation of DER, which we expect will increase. We have begun aligning some of our standards to support consistency for market participants, however, to support this, we see an urgent need for data to be collected in a more comprehensive DER Registry. We recommend the development of mandatory standards for key technology as these are a key enabler for technology development and ensuring safety in our networks. Standards must reflect ongoing development and uptake, and ensure that they do not cause a technology lock out. We also consider that reform of Part 6 is necessary to ensure that all users of the network contribute to its development and maintenance, which will become increasingly important as DER become more common.

Competitive flexibility markets are imperative to improve efficiency and decrease overall costs for consumers. We are using and exploring a range of flexibility services and are testing non-network alternatives, while ensuring options allow equal access for consumers. We agree that education on flexibility services, funding for trials, and procurement guidelines would support competitive flexibility markets. Developing multiple trading relationships and the establishment of digital and data-based platforms would unlock huge potential in driving competitive flexibility markets.

However, the market is relatively immature, so a well-understood value exchange or market structure does not exist yet. Given our experience of the current level

of maturity of the market, we do not consider there is a need for regulatory intervention in relation to operating agreements, especially when compared with more significant issues such as information sharing and standards. Actions to resolve these issues will support market development and should be prioritised.

The Northern Energy Group views itself as an example of cooperation and collaboration between EDBs. We were created around a shared interest in delivering future-ready electricity systems to customers and a common belief that consumer voices need to be stronger in industry and government decision-making. We are an active and engaged forum for our customer-owned distribution businesses to collaborate and share best practice.

We see the sector as being on the brink of significant change and opportunity, and we want to lead a new energy future with the voices and interests of our communities at the centre. Individually and as a group, we are investing in our networks to prepare for and support a low emissions economy in New Zealand. We invite the EA to continue engaging closely with us to address the challenges we jointly face in decarbonising New Zealand.

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## About Us

## ABOUT US

The Northern Energy Group formed in 2019 around a shared interest in delivering future-ready electricity services to communities and a common belief that consumer voices need to be stronger in industry and government decision-making.

The Group consists of Counties Power, Northpower, The Lines Company, Top Energy, Waipa Networks and Vector.

As networks that are entirely or majority owned by customer trusts, we believe that customers' interests belong at the heart of our energy sector.

We see the sector as being on the brink of significant change and opportunity, and are committed to leading a new energy future with the voices and interests of our communities at the centre. Together, nearly 40% of New Zealand's power connections (ICPs) are across our networks.





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# Introduction



# INTRODUCTION

The New Zealand energy system is at an exciting moment. We know that we need to decarbonise our economy, and the energy system will play a fundamental role in this challenge. We also need to decarbonise our transport system and, as this becomes further electrified, transport will become increasingly integrated and inter-dependent on the electricity distribution businesses (EDBs) distribution networks.

The Northern Energy Group welcomes the consultation by Te Mana Hiko / the Electricity Authority (EA) on *Updating the Regulatory Settings for Distribution Networks: Improving competition and supporting a low emissions economy*.

Fundamentally, we agree with the objective that guides the EA discussion paper, namely:

*To promote competition in, reliable supply by, and efficient operation of, the electricity industry for the long-term benefit of consumers.*

As EDBs that are entirely or majority owned by customer trusts, the long-term benefit of consumers guides our business decisions, which is especially important for all our customer groups, including those facing energy hardship and those unable to participate in the adoption of new technologies.

In this submission, we wish to provide our collective views on the best approach to the regulation of distribution networks that will:

- support an affordable transition to a low emissions economy
- ensure all consumers benefit from

the changes in technology and innovation happening now

- benefit the environment and result in sustainable outcomes.

## **We want to learn from international experience**

New Zealand is in good company in seeking the right regulatory settings for distribution networks to enable us to maximise the benefits of distributed energy resources (DER). These settings can also ensure that DER is integrated in a way that strengthens the overall resilience of our energy sector. We know there are instances in which unmanaged DER has led to perverse outcomes for electrification. For example, there is potential for increased DER to result in reduced power quality and reliability (i.e., black outs and brown outs) due to un-managed voltage levels. Unmanaged DER can also lead to capacity constraints, increasing curtailment pending network capacity upgrades to integrate more electric vehicles (EVs) or DERs. These outcomes are the opposite of what is needed for affordable and accelerated electrification. To drive accelerated and affordable electrification our focus must be on increasing consumer confidence in our electricity system and driving least cost outcomes.

We strongly encourage the EA to take learnings from other jurisdictions in instances where we have witnessed high DER uptake but without the supportive market environment to realise the benefits across the network. In Germany and Australia, the approach of 'more distributed but not integrated' DER has resulted in

curtailment and reduced reliability.

Driven by policies for renewable generation, Germany saw major growth in DER penetration but insufficiently considered how to integrate DER with the existing power system. In addition to technical challenges, a lack of coordination in planning and deploying DER resulted in increased costs for all customers and did not enable the system to capitalise on the full value of DER.

Similarly, the Australian Renewable Energy Association (ARENA) considers that challenges in DER technology integration in Australia have resulted from a lack of coordination and visibility. The networks' capacity to support exports from consumer DERs is rapidly being exhausted, with customers increasingly facing growing limitations to the amount of energy they can export to the grid.

These are salient lessons for New Zealand.

### **We want a future-focused, no regrets approach**

We have an opportunity now to lay the foundations for smart, integrated, and resilient distribution networks in New Zealand.

*He Pou a Rangi / the Climate Change Commission* has provided clear advice to the government on how to enable the transition to a low emissions economy. While the government develops its full Emissions Reduction Plan, we can already see key policy approaches emerging for transport that will impact the energy sector, such as the Clean Car Discount.

With these changes ahead for New Zealand, we are confident that if we put in place the right settings now; enable fuller access to and sharing of information; and develop future-focused standards, we can achieve the EA's objective and enable the electricity industry for the long-term benefit of consumers.

### **We are taking collective and individual action**

For each theme in the EA's discussion paper, this submission provides our collective view with regard to:

- our experiences of the issues identified by the EA
- our view on the urgency of the issues
- our views on the options.

As a group, we support the submission by the Electricity Networks Association (ENA), and several of our members have also submitted individually.

We welcome the opportunity for further engagement and ongoing dialogue, including hosting you at our respective networks.



Table 1 provides a summary of our views. We have drawn from the discussion document framing of minor, medium or significant. We have also indicated which options we support and have emphasised in bold those we believe need to be advanced with urgency. This reflects areas where we think action is needed now, vs areas where we see action is needed in the medium- and long-term time horizons to ensure emergent markets for DER flourish.

In the discussion document, several thematic areas are provided with suggested interventions listed. We would

like to emphasise that there is substantial overlap between the thematic areas and the interventions suggested have benefits which cut across multiple themes.

Table 1: Summary of the Northern Energy Group's views

Theme	Our view on the urgency of issues	Options that we support <sup>1</sup>
Information sharing	Significant	Collaboration between all industry participants Guidance for reporting <b>Shared data through API</b>
Electricity standards	Significant	<b>DER Registry</b> <b>Develop new standards</b> <b>Reform of Part 6 to ensure equitable contribution to network costs</b>
Market settings for equal access	Minor	Enhanced disclosures and comparative report Funding for trials Procurement guidelines <b>Developing multiple trading relationships</b> <b>Digital and data-based platforms</b>
Operating agreements	Minor	Support development of the market through a DER register and appropriate standards
Capacity and capability	Minor	<b>Increase engagement with EDBs</b>

<sup>1</sup> The options in bold are those which we view as requiring action in the short term.





# Context

## CONTEXT

### **Significant collaboration among EDBs (and other players) is taking place.**

With a focus on serving our communities, we are committed to collaboration to ensure that all our consumers benefit from the changes in technology and innovation happening across our distribution networks. Working together to ensure resilient, reliable networks is at our core, which is essential to supporting a decarbonised economy.

This has accelerated over recent years as networks understand the challenges ahead and look to work together to solve these.

### **It is important to take a ‘no regrets’ approach to regulating these issues.**

It is crucial to enable new competitive markets to develop in a 21st century technological environment. These markets require different conditions to those that were envisioned by our regulatory framework in the 1990s. We encourage a regulatory approach which is market- and industry-led. It needs to be evidence-based and agile enough to respond as we collectively learn and markets evolve.

For example, we know that to maximise consumer value from DERs requires coordination, rather than the siloed view of competition that sits at the heart of market segmentation. There is a need for regulatory change to enable new markets to flourish – and for regulation to be responsive to evidence, consumers and industry. We want to work with the EA transparently

to collectively learn about what it takes for these markets to succeed and what is required to maximise consumer value.

### **Locally-owned EDBs have a key role to deliver efficient and quality services to their communities.**

Research undertaken by Dr Richard Meade explored the implications of different ownership models of regulated monopolies. It found that customer-owned monopolies value consumer surplus, not just profits. They also deliver lower prices and higher quality services than their investor or government-owned counterparts.<sup>1</sup> Being consumer-owned also drives our focus on long-term consumer outcomes such as community intergenerational value, rather than simply short-term profit.

We also know that locally-owned infrastructure providers make investments for their communities, supporting broader regional economic development, whereas this wouldn't have occurred otherwise. Examples from the Northern Energy Group include providing ultra-fast broadband (UFB) in regions that would otherwise be underserved and seeding local EV charging networks to support the regional adoption of EVs.

### **EDBs are already thinking about the issues and taking a principles-based approach.**

We are actively considering the potential immediate and future impacts of the issues identified in the discussion document.

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<sup>2</sup> [Dr Richard Meade, The Role of Customer-Owned Electricity Distribution Businesses in Accelerating Distributed Renewables Uptake – Implications for Policy and Regulation, April 2021](#)

With electrification and increasing DER being key enablers to our transition to a low emissions economy, we view EDBs as an integral player in facilitating uptake.

As a collective, we are exploring the impacts of DER on our networks, and the opportunities it might offer consumers in terms of either reduced line charges, increased utilisation, and throughput without additional cost, and expanded access to energy services.

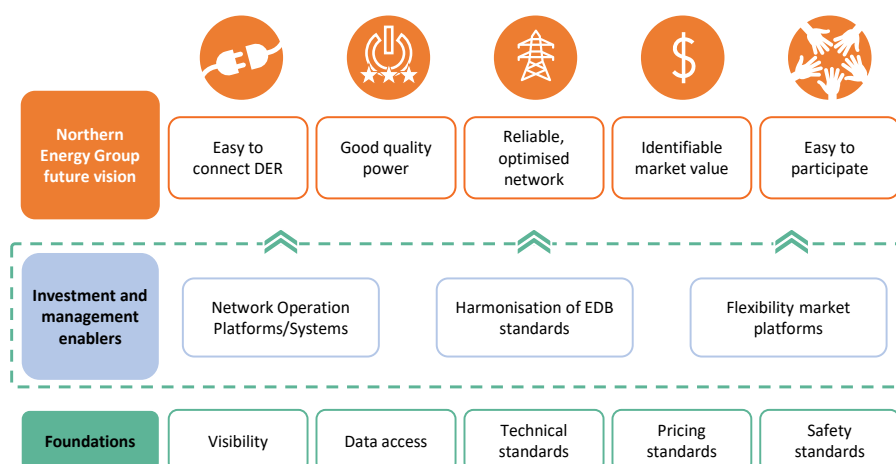
We are proactively working on solutions to meet the challenges associated with this shift in our systems. To help us achieve this, we have developed a set of key principles informing our approach to delivering an affordable and effective energy system that delivers value for consumers. Our submission is informed by these principles and reflected in a supporting road map outlined below (See Figure 1).

The principles are:

- reliable, core infrastructure
- electricity services designed for consumers
- enabling demand-side participation
- optimising use of existing network infrastructure
- protection of system stability
- fair pricing for all network users
- standardisation and platforms for efficiency
- capable, skilled workforce
- collaboration and sharing of expertise
- enabling innovation
- future-focused technical standards



Figure 1: Northern Energy Group road map



**We encourage the EA to work closely with EDBs on standards and regulations development to establish the foundation upon which we can build a participatory energy market.**

New Zealand needs the correct foundations and relevant investment and management enablers to build a participatory energy market. There is urgency to establish these foundations to set the pace and direction toward New Zealand’s low emissions economy. These foundations include:

- visibility and data access
- technical standards
- pricing and safety standards.

We strongly recommended establishing an effective partnership between the EA and EDBs to drive the development of standards and regulations. This engagement needs to be widespread as there are a range of EDBs with different challenges and opportunities. We are ready and keen to participate in this and note work happening across government – including from MBIE and EECA – to support an effective ecosystem of standards and regulation that can enable affordable and accelerated electrification. All EDBs face

different challenges and opportunities in serving their local communities – broad engagement with EDBs is an opportunity to reach a breadth of consumer interests.



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# **THEME 1: INFORMATION ON POWER FLOWS AND HOSTING CAPACITY**

# THEME 1: INFORMATION ON POWER FLOWS AND HOSTING CAPACITY

## Northern Energy Group overall position

Challenges continue for accessing network and consumption data. Limited access is increasing risks related to network maintenance, safety, and affordability.

Theme	Our view on the urgency of issues	Options that we support
Information sharing	Significant	Collaboration between all industry participants Guidance for reporting <b>Shared data through API</b>

We agree with the EA that distributors need greater visibility of the performance on their high-voltage (HV) distribution assets (i.e., transformers and residential and business subdivision HV reticulation) and low-voltage (LV) networks. This will optimise consumer value from the connection and use of DER (including by flexibility traders), as well as support network reliability and operational efficiency.

Greater visibility requires obtaining consumption data and power quality (e.g., voltage) data. This data can inform asset management and network investment decisions, supporting forecasting and planning decisions. Real-time consumption and power quality data can also support operational decisions, monitoring network performance minute-to-minute and day-to-day.

In addition to the objectives provided in the discussion document, greater access to data

will support better safety outcomes, network management, and improve DER integration.

We have different information needs for making planning and operational decisions. We have experienced challenges with respect to accessing both network operational data and consumption data. We have found access and quality of supply varies across metering equipment providers (MEP) and retailers, making it difficult to source consistent data for use across a whole network for planning or operational purposes. There is also inconsistency across MEPs regarding meter functionality.

We recognise that the original deployment of current smart meters for retailers (primarily to serve revenue metering purposes) does not align with the present and future information needs of EDBs. Timeliness of receiving information has also been an issue for some members which has delayed resolving customer complaints.



To help resolve some of these issues, we have been actively engaging MEPs and retailers to develop arrangements for the supply of data.

In some cases, the usability of data supplied by retailers has been limited as only certain subsets of customer data have been made available and data has been anonymised. Some of our members are working as part of an ENA-led working group to develop a communication specification for data exchange of network operational data.

Given the potential value we can gain from increased access and information to data, we consider the urgency of the issues described as being **significant**, and we are actively working to resolve them.

### **Our views on potential options for information on power flows and hosting capacity**

We recommend better flows of data across New Zealand's infrastructure planning system – including MEPs, retailers, EDBs and the regulator. Data is needed both in real-time to support network operations and to be available for later analysis to support pricing, asset management, and network design.

#### **Example 1: Customer requirement to report**

*The UK has acted to ensure that networks have visibility of all 'low carbon technologies' by requiring customers to notify their local network when installing solar PV, heat pumps, Electric Vehicle (EV) charging points, or battery storage to ensure safe and effective operation of the electricity networks. We recommend similar steps are taken in New Zealand given the increasing impact that DERs are likely to have on the network. See suggestion of DER registry under Themes 2 and 3.*

The underlying problem is both the coordination issues around the use of data through the supply chain, and the need for digitalisation. This is in part due to the regulatory settings not supporting digitalisation. The focus needs to be on identifying which regulatory settings are required for distributors (and the wider electricity sector) to fully embrace digitalisation as quickly as possible.

#### *Collaboration between all industry participants*

To improve flows across the system, there needs to be a collaborative effort between all participants to determine which data is useful for New Zealand's transformation to a low emissions economy.

We see value in continued discussions between EDBs and DER providers on what type of hosting capacity information would be useful. We have data that we can make available in the short term for medium – and high – voltage networks. We can expand on this as information sharing and visibility improves. We view this type of collaboration as an ongoing conversation



between all participants in which we can enhance data sharing over time.

#### *Guidance for reporting*

We support the option presented by the EA to “publish guidance for distributors to report on export congestion and network investment needs”. Some members are already working on modelling, validating, and publishing export congestion information. However, the information needs to be useful for all industry participants.

We recommend EDBs, industry participants, and the EA develop an agreed format for reporting, to ensure consistency and that the information produced is useful. In particular, we want to increase visibility through better integration and effective access to operational data. We know system impacts from EVs will happen across our networks if charging is unconstrained (particularly around clusters of EVs in residential areas). An extension of visibility to EV installations is a bare minimum requirement for future network management.

One option to support greater visibility is for EDBs to share heat maps to indicate current capacity constraints. It would need to be ensured that the information collected is timely and useful to other participants, which relates to the importance of collaboration as discussed above.

#### *Shared data through API*

We support the option for “shared data through an application programming interface (API)” and agree with the Innovation and Participation Advisory Group’s suggestion that the repository should not be physically centralised. Instead, modern APIs should be used to connect data requestors directly with data

holders. We suggest a shared API utilising a standard format.

We agree that MEPs should be responsible for ensuring that half hourly consumption data is accurate, up-to-date, and in the correct format for the API to retrieve. We suggest that basic operational data is also included (e.g., flags for site generation, outages, neutral faults).

Providing EDBs with this data would enable more efficient network planning and operations, facilitating improved investment decisions and supporting the integration of DER. This would also support the proactive management of emerging safety issues.

For example, data on EV charging installation locations would help networks deploy more efficient responses where new EV charging can be attributed to load changes; inform better forecasting of EV uptake supporting investment prioritisation; and, in conjunction with consumption data, help ‘right size’ future investments by enhancing networks’ understanding of EV network impact.

There is a matter of urgency to achieving visibility of EVs (see example 2).

In the in the three years from 2018-2020, Vector received approximately 300 applications for distributed generation. In the same period, there were 10,000 new EVs registered in the Auckland area. We know that with current government policy settings, this trend is likely to accelerate.

Furthermore, the Climate Change Commission has recommended the phasing out of combustion vehicles entering, being manufactured, or assembled in New Zealand by no later than 2035. This is aligned to many

countries in the OECD. If this were to occur, then there would be a rapid transition in New Zealand's vehicle fleet to electric vehicles.

We know it is likely that EDBs and traders will have their own preferences of what data and services they require. We view a centralised data store as less flexible in terms of changing data depending on EDB and trader needs. It would also be difficult and costly to maintain and would likely be less secure than an API.

**Example 2: EV impact on the low voltage network**

*EVs can materially impact loadings on the LV networks, contributing to a doubling of peak demand. For example, standard current home EV chargers are 7kW, which draws a similar load to cooking the evening meal.*

*However, faster chargers are coming on to the market and on average New Zealand's vehicle ownership is above two cars per home. Unconstrained, multiple houses on an LV network charging at peak can quickly overload this LV capacity through to the distribution transformer, requiring capacity upgrades. Shifting that load to off-peak utilises the spare capacity network, at no cost to consumers.*



## **THEME 2: ELECTRICITY SUPPLY STANDARDS**



# THEME 2: ELECTRICITY SUPPLY STANDARDS

## Northern Energy Group overall position

Some of our members regularly experience issues related to the connection and operation of DER, and we expect this will increase.

This reflects a lack of standards for some key technology, especially EV chargers, and other standards being out of date.

We have begun aligning some of our standards to support consistency for market participants.

Theme	Our view on the urgency of issues	Options that we support
Electricity standards	Significant	<b>DER Registry</b> <b>Develop new standards</b> <b>Reform of Part 6 to ensure equitable contribution to network costs</b>

Standards are an important enabler for technology development and ensuring safety in our networks. Having more fit-for-purpose standards for DER would also facilitate realising their benefits and reducing their harms.

Some members regularly experience issues related to DER connection and operation:

- **Unbalanced phasing:** When connecting DER, some electricians shift load at multi-phase installations onto one phase, particularly in rural parts of the network. This is intended to maximise self-consumption of solar generation and reduce cost to the consumer, since multi-phase inverters are more expensive. However, it can create unbalanced phasing. Network approvals require load to be balanced across phases, but it is difficult to prevent

electricians reversing this once the installation is connected.

- **Voltage issues:** Large volumes of DER can create voltage issues for feeders. For example, a developer of a large residential subdivision (more than 200 homes) required purchasers to install a minimum of 3kW solar generation. As more homes were built and distributed generation connected, this created voltage issues for customers further down that feeder. The EDB had to invest in splitting the feeder to overcome this issue.

The EDB also trialled home energy management to help optimise generation within the properties themselves, both active and passive. This improved internal usage; however, there was little interest in customers continuing this beyond our trial despite there being

cost advantages to them. Customer behaviour and preference for home energy management must be taken into consideration in the development of standards.

- Solar also occasionally exacerbates voltage issues for individual customers where inverters have not been able to operate during peak solar output.

The obligation to update the Registry for new solar installations is also challenging. The obligation falls on EDBs, which are not responsible for installing the solar, testing the installation, installing the metering, or livening the solar. At the minimum, this creates a lag before EDBs know solar is installed. The solar installer could be required to provide us with the installation information in a timely manner to enable Code requirements to be met.

Some of these issues would be resolved through appropriate standards. We also consider that introducing some new standards now will prevent future issues particularly in relation to EVs, chargers, and batteries.

There is an emerging practice within the Northern Energy Group of aligning standards and operational procedures. Some members have, for instance, adopted Vector's large-scale distributed generation standard, and others are aligning their operational procedures for advanced distribution management system (ADMS) implementations. We expect to see this trend increasing in the future.

Collectively, the Northern Energy Group considers the urgency of these issues to be **significant**.

## Our views on potential options for electricity supply standards

### *DER Registry*

Currently, networks have limited visibility of what is behind the meter. It would be useful for more data to be collected and shared about DER that exists behind the meter for operational and network planning purposes.

We know from the advice of the Climate Change Commission, and the government's introduction of the Clear Car Discount, that the number of EVs in New Zealand will increase. As discussed under Theme 1, EDBs need visibility of EVs and EV chargers for planning and procurement to ensure the reliability of the network.

Of the options identified by the EA, we strongly support establishing a comprehensive DER Registry. We consider this should include batteries, car chargers, EVs, and other devices that may impact on a network.

Some consideration would need to go into how this data could be captured and updated effectively without being unduly burdensome on consumers. This is not dissimilar to data which is required for connection and compliance with other utilities – an option could be to require the installer to provide this information to networks.

We suggest the most practical way to achieve this would be to extend the current installation control points (ICP) registry to include all forms of DER, but in particular EV chargers and battery storage.

This option would also assist in addressing the issues related to information sharing.



### *Standards development*

We support the development of mandatory standards for key technologies. We advise regulators to take a 'no regrets' pathway and avoid technology lock out.

We especially consider there is an urgent need to ensure that a wider range of devices and distributed assets that are being installed today, have the capacity for dynamic management tomorrow. This is particularly important for EVs, which will place an increasing role in the New Zealand light vehicle fleet (see example 3).

We consider the following standards and protocols need to be implemented at an industry level to facilitate the large-scale uptake of DER:

- communications protocols for the provision of smart meter data to industry participants
- vehicle-to-grid (V2G) standards
- protocols for networks to communicate with and control EV chargers (or potentially directly with the EV) to effectively manage load
- power quality standards to be updated to reflect congestion.

We support the provisions in the voluntary publicly available specification (PAS 6010:2021 and 6011:2021) developed between Standards NZ, EECA, the Commerce Commission, Electricity Authority, and industry participants – which include a communications protocol for smart charging, as well as health and safety standards.

The EA does need to strike a balance between mandatory and voluntary standards, recognising the pace with which technologies can develop, and

the purpose of ensuring that consumers benefit from new innovation. Standards should ensure interoperability – and where they are mandatory reflect minimum requirements of health and safety and features which are necessary to avoid tech 'lock-out' – which would occur when consumers being unable to leverage value from DER because devices are not able to be digitally managed. This would constrain innovation and the emergence of new markets. The UK's Homecharge Scheme – which covers smart chargers only – still includes ~500 different models across 64 different manufacturers. This ensures that consumers are able to participate in demand management schemes in the future growing the market for new innovative products and services.

We encourage the EA and other relevant agencies to work closely with industry in developing these standards to ensure they support innovation, are technology agnostic (e.g., don't pick winners), and keep up-to-date with technology changes.

As we submitted to the Ministry of Transport, we encourage development of standards that provide minimum thresholds – this ensures a floor but still enables those that want to innovate more to do so.

However, unlike connection and operation standards for distributed generation, such standards are not provided for in the Code, which, governed by the Electricity Industry Act, can only regulate industry participants as defined in the Act. We note that the recently released Electricity Industry Amendment Bill does propose changes which would enable the Code to regulate some actors not currently understood as industry participants. However, this is only

for the purposes of restricting relationships between two classes of industry participants, where those relationships would not otherwise be at arms' length.

users of the network (whether importing or exporting) contribute to its development and maintenance

There remains an urgent need to ensure that a wider range of devices and distributed assets which are being installed today (and which increasingly have the scope to behave similarly to distributed generation – such as through bi-directional flows of power as with Vehicle to Grid technology) have the capacity for dynamic management tomorrow. We encourage the Authority and cross-government counterparts to drive an agile and coordinated response to ensure this.

We would also encourage creating industry working groups to consider connection and operation standards under Part 6. These should similarly provide minimum thresholds to provide consistency to consumers, retailers, and DER providers.

Overall, updating of standards of supply needs to occur in parallel with updating of asset management and the associated network connection requirements, to make DER and flexibility a feature of network and system operation.

#### *Reform of Part 6 to ensure equitable contribution to network costs*

The Northern Energy Group also supports a review of Part 6 of the Code. Currently, there is no requirement for DER and flexibility services to contribute to the development and maintenance of the network that they benefit from. As DER and flexibility services increase, this will become increasingly significant – creating, in effect, a 'free rider' problem. We consider that Part 6 should be reformed so that all

### **Example 3: Household EV uptake**

*New Zealand households currently average above two vehicles. As the private vehicle fleet transitions to electric vehicles, households will increasingly have one and then two EV.*

*What will happen when most of these homes want to fast charge at 6pm?*

*Wellington Electricity's EV Connect project estimates that, if demand is not shifted away from peak periods, networks will have to be rapidly upgraded to accommodate an estimated 80% to 100% increase in energy consumption at this time.*

*Smart chargers will alleviate this.*

*To provide an affordable energy future for our consumers, it is critical that EV charging is moved seamlessly out of the peaks, while delivering to customer expectations of a fully charged vehicle when they need it.*

*We see an urgent need to develop standards for EV chargers, given the risk of tech lock-out. This is where – given the cost of retrofitting – every passive EV charging installation effectively 'locks-out' potential for dynamic management.*

*This impacts the individual consumer who is unable to access savings and benefits from a demand management scheme; the future consumer who may live in the home with the passive charger in the future; as well as every single electricity consumer – EV owner or not – who must pay higher prices as the result of unmanaged demand.*

*The UK has introduced an EV charger standard, which is mandatory for those that receive a government subsidy for the charger through the Homecharge Scheme. In addition to this, the UK energy regulatory Office of Gas and Electricity Markets and the Department of Business, Energy and Industrial Strategy has decided to regulate for the installation of EV chargers with 'smart' capability with legislation to be introduced by the end of the year in response to consultation undertaken in Oct 2019.*

*The standard will mandate 'smart' chargers allowing owners to charge vehicles off-peak. This will dynamically reduce peak demand, shown to be more effective than attempts to 'manually' charge off-peak through scheduled charging. As this is static, scheduled charging has been found to shift the peak – rather than flatten it. .*

*We consider this is an important example for New Zealand to follow. We support the Minimum Energy Performance Standards including the recent proposal to ensure that energy-using customer appliances have 'smart' capability.*



# THEME 3: MARKET SETTINGS FOR EQUAL ACCESS



# THEME 3: MARKET SETTINGS FOR EQUAL ACCESS

## Northern Energy Group overall position

We are using and exploring range of flexibility services and are testing non-network alternatives.

The market is relatively immature, however being consumer-owned, we are highly incentivised to explore competitive options for customers now.

Theme	Our view on the urgency of issues	Options that we support
Market settings for equal access	Minor	Enhanced disclosures and comparative report Funding for trials Procurement guidelines <b>Developing multiple trading relationships</b> <b>Digital and data-based platforms</b>

We support competition and effective market settings for equal access. We recognise that competitive flexibility markets can improve efficiency and decrease the overall costs for consumers. Given our consumer-ownership, we are highly incentivised to explore DER options for consumers, including introducing and supporting DER competition on the network.

We also recognise that we need to ensure equal access for consumers when it comes to using flexibility services. Impacts on equity must be considered in any policies which incentivise increased network upgrades. Equal access policies should be mindful that unintended costs don't flow down to consumers who are less able to participate (whether through energy hardship or otherwise). The regulatory framework should ensure that

pricing principles for DER connections consider equity, where appropriate. This consideration should include an assessment of which costs fall on consumers.

We are currently using and exploring a range of flexibility services to support network management. This involves understanding the characteristics of these services to identify the value of the benefit to our networks. Some examples of the services we are testing are:

- utilising ripple relays to manage our networks and address load control
- using diesel generation to enable essential maintenance, to support management of specific constraints on the network and to maintain power in planned outages
- remote area systems with solar and

batteries (i.e., customer-sited battery storage) are being considered in substitutions for line upgrades to remote areas (see example 4).

**Example 4: Remote solar deployment**

*The Lines Co. is working with Ngāti Maniapoto and EECA to deploy solar in marae, areas of land, and homes, using the network to connect to solar concentration points.*

*The objective is to enable communities to access solar via the network rather than via consumers who in high deprivation areas are unable to access solar benefits due to affordability, home ownership and poor location for solar production.*

Some of our members have found challenges with exploring opportunities for network optimisation and reduced costs to customers, (see example 5).

**Example 5: Barriers to monitoring reduced demand**

*In 2019, Waipa Networks installed 350kW of solar generation within a new combined commercial/residential development to monitor the potential for reduced demand on the network through optimisation and potentially at a future stage battery storage. The project originally envisaged encouraging optimisation and reduced costs to customers through tailored pricing. However, a prolonged process under the Code to set up the embedded network, combined with variable access to half hourly resolution meter data, led to the pricing optimisation and embedded network aspects being wound up after two years.*

We are also testing non-network alternatives, with some members investigating non-network solutions for every large network investment. We have not yet found non-network alternatives that are viable – ensuring affordability for our customers is paramount, so we will continue to explore options. If a viable solution is identified, a competitive process would be used.

Given that the market is still relatively immature and not yet fully developed, we consider the urgency of the issues described in the discussion document as being **minor**. However, we see merit in tracking developments now to see when the price point becomes competitive.



## Our views on potential options on market settings for equal access

### *Enhanced disclosures and comparative report*

We agree that education on flexibility services would be an effective option to pursue. This could include the benefits of using flexibility services. We support the EA's options to review existing disclosure requirements for improvements and to develop a comparative report to provide this education and improve understanding.

While we support the option of reviewing disclosure requirements on distributors in principle, from a competitive standpoint, this is likely to raise issues around commercial sensitivity. To address this, this option could include an enforced disclosure of flexibility service bids after 18 months to two years, so that enough time has passed to be less commercially sensitive at the time of disclosure.

This could constitute an anonymized historical record of costs and could provide a basis for supporting future regulatory decision-making. The regulator would have a role to play in establishing rules to mandate the disclosure of flexibility service bids.

### *DER Registry*

As suggested under Theme 2, a DER Registry would also support enhanced demand side participation and address some of the issues discussed under this Theme. The Registry would provide EDBs and other market participants with further information on loads and would help us determine where there are non-network alternatives.

### *Funding for trials*

We would encourage the regulator to provide funding for trials. With enhanced disclosure and comparative reporting, as outlined above, the regulator could ensure that trials aren't being duplicated and that the results from trials are shared.

### *Procurement guidelines*

With respect to the options to address competition for flexibility services, we support the option of industry-developed procurement guidelines for traders. These would help to ensure all parties are treated equally and indicate distributors' approach on DER trading, including the differing service specifications and performance requirements.. However, we consider that there are several unknowns with respect to the specifics of flexibility services.

To address the nature of these unknowns, the guidelines could comprise learnings from industry participants on procurement exercises. Existing government standards for procurement could be used as a basis.

We would also support a tender platform where participants could advertise their flexibility requirements and providers could tender to provide solutions.

### *Enabling multiple trading relationships*

We support trialling multiple trading relationships and encourage the EA to continue its workstream on this. We agree that current market settings, which mean that consumers may only buy from and sell to one supplier, do not support those customers who want greater choice and competition. As mentioned under Theme 2, we consider that customer engagement is fundamental to support customers to understand their options and the opportunities that arise from multiple providers.

### *'Standing offer' price information for DER*

The market maturity is currently not there to enable a 'standing offer' for DER.

### *Digital and data-based platforms*

We view digital and data-based platforms as being fundamental to enabling dynamic DER management, and to unlocking new innovative markets and services. Whilst out of scope of the EA's jurisdiction, a potential catalyst for the creation of a flexibility services market and the establishment of platforms is for the Commerce Commission to update its regulatory settings to make flexibility a feature of network management and to align funding with the provision of platforms. This would also support increased LV visibility, as discussed under Theme 1.

For example, smart digital platforms could be utilised for EV charger aggregation within networks across New Zealand to purchase peak services. This could offer a solution to EDBs to reduce peak load when congestion occurs. Related to the discussion under Theme 2, platforms such as this

would need to be developed in line with standardised equipment requirements and communication protocols.



# **THEME 4: OPERATING AGREEMENTS**





# THEME 4: OPERATING AGREEMENTS

## Northern Energy Group overall position

We have mixed experience negotiating operating agreements. This is more a symptom of an immature market for these services than market failure. We consider the market needs time to mature and actions to resolve information sharing and electricity standards will support this development.

Theme	Our view on the urgency of issues	Options that we support
Operating agreements	Minor	Support development of the market through a DER register and appropriate standards

We agree with the EA that contracts for flexibility services are still uncommon in New Zealand. In our experience, this is not so much an issue of the complexity of negotiating contracts, it is more a reflection of the state of our market and the low levels of DER. A well understood value exchange or market structure to support this does not exist yet.

In general, members have not been approached by a significant number of parties offering services. Our experience is that products do not yet exist, or are not price competitive on our networks. For example:

- some of our members have offered contracts for hot water cylinder ripple control to retailers with limited interest. For example, Vector offered retailers a programme called “Demand Exchange”. The programme offered all of Auckland’s hot water load control, since it was incapable of targeting specific ICPs,

to retailers as a hedging tool against the spot price for electricity. There was minimal utilisation.

- some developers wanting to install DER have approached EDBs without appreciating there is cost involved for EDBs in integrating DER reliably.
- Retailers generally want to respond to wholesale market signals whereas EDB requirements are more around network peaks. There can therefore be a mismatch between needs of different industry players.

We can see room for the market to develop. For instance, there would be value in the emergence of companies that aggregate EV chargers and offering this as a flexibility product for EDBs. We foresee this emerging once the scale of EV chargers increases, supported by the development of appropriate standards.

Collectively, the Northern Energy Group considers the urgency of the issues

described under this Theme are **minor** given the maturity of the market.

## **Our views on potential options on operating agreements**

*Support market development by addressing information sharing, electricity standards, and market settings*

Given our experience of the current level of maturity of the market, we do not consider there is a need for regulatory intervention, especially when compared with more significant issues such as information sharing and standards.

Developments such as a DER Registry and standards for smart EV chargers would do more to ensure future readiness and support the market than standardised operating agreements. Having a greater understanding of the network circumstances will assist in defining the services needed.

If the EA were to consider developing guidance for operating agreements, we would encourage this to occur through industry collaboration with the ENA.



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## **THEME 5: CAPABILITY AND CAPACITY**

# THEME 5: CAPABILITY AND CAPACITY

## Northern Energy Group overall position

The Northern Energy Group creates an active and engaged forum for our customer-owned distribution businesses to collaborate and share best practice. Members work together on public safety campaigns, joint pricing consultations, and have begun aligning standards.

Consumer-owned EDBs focus on serving their customers - smaller scale and size support greater flexibility and innovation.

We invite the EA to continue engaging closely with the Northern Energy Group to address the challenges we jointly face decarbonising New Zealand.

Theme	Our view on the urgency of issues	Options that we support
Capacity and capability	Minor	<b>Increase engagement with EDBs</b>

The Northern Energy Group itself is an example of cooperation and collaboration between EDBs. We were created around a shared interest in delivering future ready electricity systems to customers and a common belief that consumer voices need to be stronger in industry and government decision-making.

- We are all responding to the changing demands of electrification and an imperative to serve our communities.
- We have similar ownership models.
- We operate across the same region.

We see the sector as being on the brink of significant change and opportunity, and we want to lead a new energy future with the voices and interests of our communities at the centre. Together, nearly 40% of New Zealand’s power connections (ICPs) are across our networks.

Individually and as a group, we are investing in our networks to prepare for and support a low emissions economy in New Zealand.

Among our members, these actions include:

- actively implementing the recommendations of the Network Transformation Roadmap.
- upgrading our advanced distribution management systems to ensure greater visibility and control of our high voltage networks, and a pathway to LV visibility and control.
- significant upgrades to information and network systems including GIS, outage management, and LV monitoring.
- developing a strategy to gain real-time visibility of our LV network and improving LV visibility and data



capture, including projects to map our LV network capacity and constraints.

- ensuring our distributed generation standards are up-to-date and future-focussed.
- undertaking trials to understand the impact of DER and distributed generation on our networks, testing against modelled assumptions to validate hosting capacity and trigger points for network upgrades.
- engaging strategic alliances and collaborations that leverage global digital economy skills and capability to undertake frontier innovation projects in New Zealand. This strengthens New Zealand's own innovation ecosystem – for example, Vector's strategic alliance with Amazon Web Services has already created more than 40 full time data-based roles in Auckland. This is an example of how global expertise and investment can be leveraged for domestic economic benefit through EDBs' local ownership model.
- developing big data cloud-based customer outage platform for real-time outage notification to customers and optimising fault responses that reduce costs and outage times.

We also actively cooperate and share experiences and best practice, including:

- some members jointly consulted with retailers on network pricing for the last 3 years on their annual pricing changes and have aligned their pricing reform. This is creating consistency across the region, reducing complexity for retailers,

and therefore driving reduced costs for consumers.

- some members have implemented a common customer relationship management software to improve the experience of our customers.
- standardising annual customer surveys to benchmark performance across key deliverables including value for money, communications and reputation, and service.
- joint campaigns for public safety messages.
- cooperating to improve network operations, including procurement of GE PowerOn, aligning symbology, and operating standards.
- developing common network standards, with an initial focus on operational procedures.
- common field competency and health, safety, quality, and environment (HSQE) practice.
- ensuring supply chain security and network resilience in the context of Alert Level 3 and 4 lockdowns, providing a shared voice to inform Alert Level settings, and to develop collaborative solutions to strengthen community resilience during Covid-19 outbreaks.

Part of what defines the Northern Energy Group is that we are all customer-owned enterprises.

In our experience, small distributors are active in communities that are not attractive to larger players. Small players therefore are earlier movers into these communities. Given they are owned by their communities, they also act faster or with wider motivation than purely fiscal

returns. This includes support for faster UFB roll out and installation of public EV chargers than would otherwise have

***Example 6: The benefits of community-owned EDBs on communities***

*Some of our members, Northpower and Waipa Networks, invested in UFB to accelerate its uptake in their regions.*

*This ensured their communities received associated benefits of UFB earlier than otherwise would have occurred under investor-owned providers.*

*Vector has formal arrangements with its customer-owners to facilitate the uptake of innovative technologies that benefit its customers.*

occurred under investor-owned scenarios (see example 6).

The members of the Northern Energy Group are also part of the ENA. Its Consumer Engagement Working Group (CEWG) has broad representation from EDBs and has formed a Consumer Reference Panel consisting of key community and interest groups.

- The Consumer Reference Panel has provided input into such areas as quality of service, distribution pricing, and DER. The CEWG work programme has also included tree trimming campaigns and consumer engagement strategies.
- The Distribution Pricing Working Group has also collaborated on strategies around the implementation of more cost reflective distribution pricing with mitigation of price shock for consumers.

ENA have also formed a group considering

network billing systems with a view to work on standardisation and cost savings.

Collectively, the Northern Energy Group considers the urgency of the issues under this Theme framed as **minor**.

## **Our views on potential options on capability and capacity**

We are keen to see cooperation and collaboration grow among EDBs and with the EA. We invite the EA to continue engaging closely with the Northern Energy Group and other EDBs in responding to the challenges we collectively face in decarbonising New Zealand's economy.

We do see a need for broader and more inclusive collaboration. We need better flows of data across our infrastructure planning system – including central and local government, local networks, and across the electricity supply chain.

This is about taking a whole-systems integrated approach to our infrastructure, and includes network access to core data to enable better planning and management.

We also see the need for stronger collaboration between central and local government to ensure there is a joined-up systems approach. As our electricity and transport systems converge, there is a need for stronger coordination to deliver future ready, integrated systems.

There is a key role for the EA in navigating the increasing convergence of our energy and transport systems.

