Updating the Regulatory Settings for Distribution Networks

Summary of submissions on the July 2021 Discussion Paper

9 November 2021

Market Design

Contents

1 Overview of the consultation

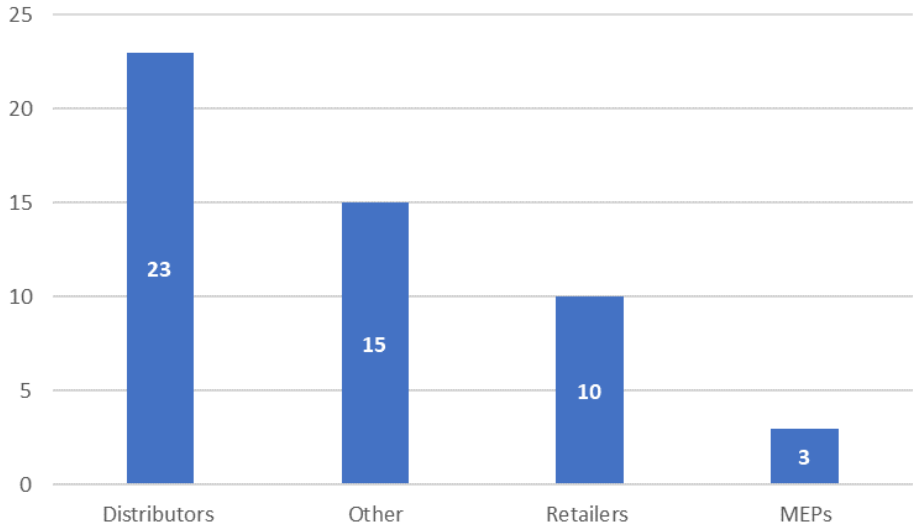
1.1 On Monday the 26th of July, the Electricity Authority (the Authority) released the discussion paper *Updating the Regulatory Settings for Distribution Networks.*[1] The discussion paper sought views on potential issues with distribution networks and possible options to overcome these issues. The discussion paper posed 20 questions across five themes:

1) Information on power flows and network capacity
2) Electricity supply standards
3) Market settings for equal access
4) Operating agreements, and
5) Capability and capacity.

1.2 Submissions closed on Tuesday, 28 September 2021. The Authority received a total of 51 submissions.

1.3 A wide range of stakeholders responded to the discussion paper. Figure 1 shows the breakdown of submissions by distributor, retailer, metering equipment provider (MEP) and 'other'. Appendix A provides a list of the submitters.

Figure 1: Breakdown of submissions



1.4 In addition to the written submissions the Authority engaged with several stakeholders during the consultation period on the discussion paper. This included discussions with members from the Electricity Retailers' Association of New Zealand (ERANZ), the Electricity Networks Association (ENA), and the Northern Energy Group (NEG) as well as nine engagements with individual distributors, retailers, and MEPs. The feedback from these discussions have been captured in this document and will inform the development of our work programme.

[1] https://www.ea.govt.nz/assets/dms-assets/28/Updating-the-regulatory-settings-for-distribution-networks.pdf

2 General themes in submissions received

2.1 There were a number of common themes in the submissions received.

There is agreement on the need for better access to data to inform operational decisions, to identify DER investment opportunities, and for visibility of low voltage networks

2.2 14 distributors stated they have experienced issues when accessing information required for visibility over its low voltage (LV) networks, which requires access to information from MEPs and the information it holds on historic consumption data and real time data.

2.3 A number of submitters also raised the difficulty in getting information on hosting capacity, which is crucial to informing operational and investment decisions (for example, see Lightforce, Dervolution, Hiringa and solarZero).

Submitters generally agreed that Part 6 of the code should be reviewed, that there needs to be minimum mandatory standards set for DER and better visibility of DER

2.4 A large number of submitters commented that Part 6 – *connection of distributed generation* of the Electricity Participation Code 2010 (Code) and the Electrical Safety Regulations (ESR) require review in light of new distributed energy resources (DER) technology and larger distributed generation connections to networks that are now occuring. A large number of submitters also commented that there needs to be visibility of location, and minimum mandatory standards set for DER equipment, for example Electric Vehicle (EV) chargers.

There were conflicting views on the competition and incentive issues around distributors owning or operating DER

2.5 A number of submitters agreed with the competition and incentive issues around distributors being involved in DER outlined in the paper (IEGA, solarZero, Hiringa, Enel X). They commented that distributors have a preference for network solutions and that distributors controlling and operating DER creates deterrence on third parties entering the market.

2.6 In general, distributors were of the view that there is no good reason to completely preclude distributors from owning or operating DER. They highlighted existing safeguards in place to address the competition and incentive issues raised in the paper. Additionally, several distributors commented that it is too early to consider additional regulatory options given that the market is still in its infancy.

Views on the difficulties in negotiating operating agreements for flexibility were mixed, but most commented it was too early to standardise agreements

2.7 Most submitters commented that they either don't have experience negotiating contracts for flexibility services or have not found the associated costs to be an issue. Some submitters noted that the market is too immature to quote experience in negotiating operating agreements.

2.8 However, for the submitters that do have experience to inform their response, they did not find the transaction costs prohibitively high. Several submitters commented that the transaction costs could potentially be a barrier to entry and that contracting guidelines could be helpful, but standardization would be likely be too difficult and costly at this stage. Some submitters also expect the costs to come down as contracts for flexibility services become more common.

Distributors provided several initiatives they're involved in to help manage the transformation of networks but generally agreed that more collaboration could be useful

2.9 All submissions from distributors provided examples of initiatives to ensure that their network can effectively manage the transformation of networks. Distributors gave several examples of groups and initiatives that promote collaboration. However, distributors generally agreed that more collaboration could be a useful way to improve efficiency through coordination.

2.10 Four distributors support consideration of clarifying the roles of the distribution network operator (DNO) and a distribution system operator (DSO). However, no distributors supported considering a single DSO model. It was noted that this would be costly, would not be an optimal way to improve efficiency, and that it was too early to consider centralised DSO capability. Three retailers support clarifying the role of the DSO compared to the DNO. These retailers suggested that different DSO models (like a single DSO) could be explored further.

2.11 A number of distributors commented there is no evidence that some distributors are not prepared for sector transformation and that options to extend the DPP or consider a single DSO model would be costly and not necessarily lead to more efficient outcomes.

3 Next steps

3.1 Using the insights gained form this consultation process and the large body of work already completed on distribution networks, the Authority will undertake to identify the issues that warrant further attention, potential options to address these issues, and a framework(s) for assessing the options. This will involve undertaking follow-up engagements with submitters where clarification and further information is required for a more complete understanding of the issues and possible options to address the issues.

3.2 The Authority plans to publish a second consultation paper early next year that presents the Authority's view on the issues, the work programme to take these issues forward, and recommended options that can address some of the issues.

3.3 Submissions have been shared with the relevant government agency where issues and options fall within their jurisdiction. Where appropriate the Authority will work with the government agency to progress those options.

4 Information on power flows and hosting capacity

Proposed issues:

a) *Distributors have previously noted that in a new technology environment they require a higher resolution view of their network and a core part of this is access to non-anonymised and non-aggregated half hourly data. However, access to real-time (or even half hourly) data is expensive and not widely available due processes required to verify, validate and estimate raw data and the way data is communicated from meters to back-office systems and end users.*

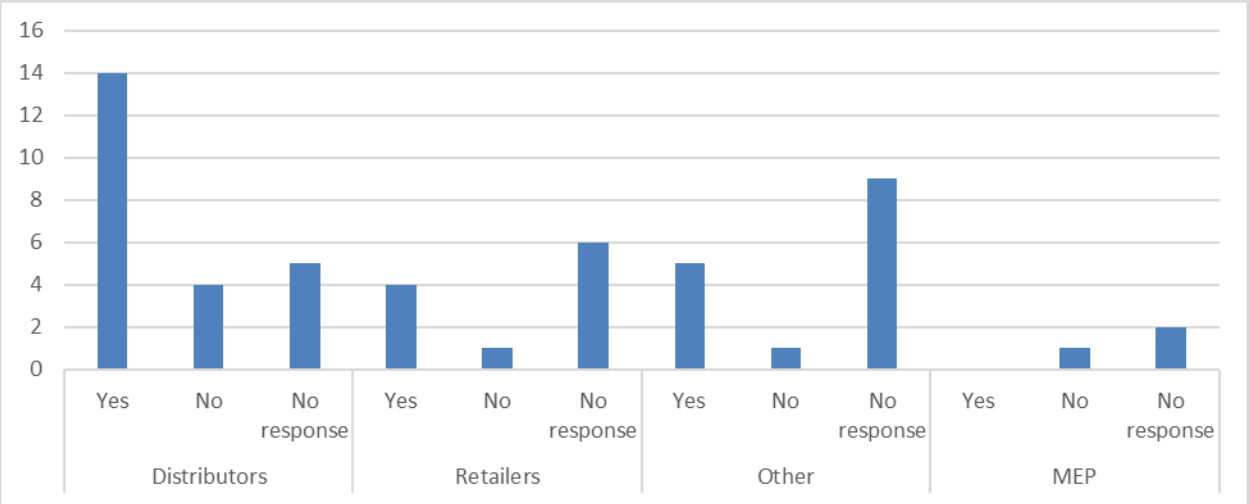
b) *Information on power flows and hosting capacity is needed to determine where the network is congested and may need to be upgraded. This information also facilitates efficient investments in networks and DER as well as the efficient operation of DER. More efficient investment decisions lead to lower costs and more reliability for consumers. However, it is difficult to obtain this information.*

Range of options presented to consider and comment on:

	Minor issue	Medium issue	Significant issue
Options	• Inform and educate consumers on how to request their consumption data • Encourage distributors to collaborate in finding the most efficient way of capturing and publishing utilisation data	• Assess options to implement shared data arrangements • Publish guidance for distributors to report on export congestion and network investment needs	• Shared data through API • Central meter data store

Q.1 Have you experienced issues relating to a lack of information or uneven access to information?

Figure 2: Have you experienced issues relating to a lack of information or uneven access to information?



Distributors

Data Template

4.1 The Data Template was introduced alongside the Default Distributor Agreement (DDA) in 2020 and was intended to give distributors a default agreement they could enter into with retailers to get access to consumption data. Seven distributors expressed difficulties using the template. One distributor stated their experience was positive.

4.2 The main issue stated was that the current form of the Data Template explicitly prohibits distributors from providing data obtained via the draft template to third parties unless individual retailer permission has been sought and obtained, which in practical application is unworkable.

4.3 Powerco expressed concerns with the inherent design of the Data Template suggesting the permission for retailers to join (which is negotiated as they are not obliged to join) will reduce quality data over time. Current arrangements require retailers to agree as to how data is combined with other datasets. Powerco stated that if all retailers agree all of the time to combine dataset then there is no impact on data quality as it currently experiences a *"patchwork of data gaps."*

4.4 Several distributors stated that the amended Data Template presented by the ENA would resolve the issues they experience when requesting data from retailers (see Vector, Alpine Energy, Northpower and Top Energy and WEL Networks.) The ENA stated noted that the *"Authority declined to make this amendment and hence the problems remain with data access."*

4.5 Orion stated it recently begun the process to negotiate data agreements, in line with the DDA Data Template, with a subset of retailers, but have identified a number of barriers (time consuming process and difficulty agreeing to minor changes) when working with retailers through this process.

4.6 Aurora Energy stated *"DDA approach does not, in our view, prevent access to advanced metering data for planning purposes. We do share the concerns of many distributors, however, that the process of acquiring the data is slow, bureaucratic and inefficient."*

4.7 Marlborough Lines stated it has not requested consumption data from retailers under the DDA, finding Appendix C of the DDA process *"cumbersome".* However, it has smart meter penetration on approximately 72 percent of its network and stated that consumption data does not necessarily reveal what particular DER is present at any given consumers installation.

4.8 Whereas, Network Waitaki has only very recently used Appendix C of the DDA for the first time to request data from a retailer on its network and stated, *"the experience has been positive overall with data supplied to us within a few days."*

4.9 Vector stated it *"consider(s) the development of the new Data Template to be a step in the right direction, there remain a number of limitations that materially restrict the ability of distributors to use or share such data in the most effective way for their existing network operations."* However, the decision not to adopt an amended template now means it must access consumption data individually from each retailer. "*This is a time-consuming process and is a barrier to the development of flexibility services."*

Retailers

Data Template

4.10 Retailers feedback through ERANZ support the current Data Template.

4.11 ERANZ stated that while there is industry agreed data sharing, uptake has been slow and *"increasing transaction costs contrary to the initiatives original intent."* However, ERANZ stated that it continues to recommend the Authority implement the DDA template in the Code to provide a practical solution to standardise data sharing.

4.12 ERANZ stated that the differing approaches taken by different distributors can lead to inefficiencies. In recent times, significant steps have been made to improve distributor access to retailer-held consumption data, mainly through the DDA process.

Distributor

Access to data and information

4.13 14 distributors stated they have experienced issues when accessing information required for visibility over its LV networks. Overview of this network requires access to information from MEPs and the information it holds on historic consumption data and real time data.

4.14 Notably four distributors that have their own meters installed on the network do not have these issues but support other distributors need to gain access to these benefits.

4.15 Feedback on MEPs discussed data inconsistencies, price of this information, time taken for data requests and the complex contractual arrangements MEPs have (see Electra, NEG, Vector, Powerco, Alpine Energy and Northpower and Top Energy).

4.16 Vector stated "*the Authority would help accelerate distributor's access to smart meter data by clarifying in the Code that distributors are permitted to engage directly with MEPs to access consumption data"*. Vector noted it is in active negotiations with two MEPs to obtain network operations data from smart meters on its network and is optimistic it will get the data needed on an ongoing basis at reasonable prices.

4.17 Marlborough Lines stated access to real time or even half hourly data is expensive. Any increase in costs for obtaining data would ultimately be passed on to consumers, so, access to data should be as non-complex as possible.

4.18 Electra stated *"as an industry, we are data rich but information poor. Industry participants, including us, hold a wealth of data that due to legacy systems that often require a heavily manual process for data retrieval means".*

4.19 Some distributors noted reluctance on the part of retailers to provide information, Westpower stated *"retailers appear reluctant to make the smart meter data available to EDBs, either in sufficient granularity or in a timely manner."* (see ENA and Powernet).

4.20 Distributors provided feedback on the lack of information about DER on its network, without visibility on the location of large DERs being installed e.g., EV chargers, distributors will not be able plan or prepare for demand this can have on the network (see Wellington Electricity, Electra and Powernet).

4.21 Distributors disagree with the Authority's suggestion that it is holding back information on its LV networks from third parties, stating that it cannot make information available they themselves do not possess (see ENA and Electra).

4.22 The ENA stated that "*until there is a clear technical, regulatory and commercial roadmap in place, access to smart meter data will be an enduring barrier to the efficient*

connection and utilisation of DER." Inability of distributors and flexibility traders to access smart meter data in a timely manner will prove to be a greater barrier to uptake of flexibility services and DER.

4.23 Four distributors who have their own meters installed on its networks (Counties Energy, The Lines Company, Network Tasman and WEL Networks) note the benefits of having access to this information, but also note gaps where they do not have oversight.

4.24 For example, WEL Networks stated it has access to smart meter data for over 70 percent of connections because of prior investments made to enable LV visibility. However, for the remaining 30 percent of connections WEL Networks has limited or no data beyond monthly aggregated volume data. It stated access to the remaining 30 percent of connections would strengthen its data set and allow for more informed investment decision making.

Retailers

Access to data and information

4.25 Four retailers (see Plains Power, Electric Kiwi, Nova and Meridian) stated they experience issues when accessing data and information, while six retailers provided no response and one stated they do not experience any issues. However, retailers did note the importance of distributors being able to obtain information for network planning purposes and suggested retailers should be able to receive congestion information from distributors.

4.26 ERANZ stated that retailers and distributors have been working through similar issues in sharing retailer-held consumption data to support network management and that retailers are committed to playing their part to support this goal.

Other

Access to data and information

4.27 Submissions from flexibility traders (Lightforce, Dervolution, Hiringa and solarZero) noted the barriers they face from retailers and distributors when accessing information required for their business operations.

4.28 Lightforce stated there *"appears to be distinct lack of understanding amongst retailers relating to simple requests such as the provision of household consumption data and at times there is reluctance amongst gentailers/retailers to share information if the collector has a vested interest in the DG industry."*

4.29 Dervolution stated *"we consider part of the underlying problem is the continued reliance by electricity sector on analogue data, in part due to the regulatory settings not supporting digitalisation."*

4.30 In its submission solarZero stated it is seeing is a reluctance by distributors to address capacity constraints well in advance of the issue becoming acute.

4.31 Hiringa stated that flexibility services will often be an afterthought rather than a key revenue stream for projects, resulting in missed opportunities to utilise flexibility services. "*Distributors have a greater access to information so project developers with flexible assets such as Hiringa are often in a very weak position to negotiate with distributors or flexibility traders for flexibility services."*

MEPs

Access to data and information

4.32 MEPs as the provider of information did not experience any issues with accessing information but did note there is no evidence to suggest they are not providing the information required by distributors for their network and operational needs.

4.33 Smartco stated it does not experience any issues and is working though access to data from the MEP and each distributor, noting this process has been slow mainly due to their cautious approach to ensure it meets the requirements of the distributor.

4.34 Vector Metering stated it is in active discussions with a number of distributors and assisting them in defining their data needs, noting it has committed resources to develop its new network operations data service which is expected to commence in Q1 of 2022.

4.35 Substantive feedback was provided by Intellihub who stated that the "*Authority's problem definition is that distributors are refused data or not provided it on an economic basis. This is not the case in Intellihub's experience"* and request the Authority take the option of regulatory intervention out as it works constructively with distributors and key industry bodies to facilitate access to data.

4.36 Intellihub stated that it was not clear why distributors have not shown a greater interest in obtaining access to data services and it would be happy to provide information. It noted that distributors (and flexibility traders) are not prevented from requesting access to data they require for their purposes. MEPs, such as Intellihub, have a commercial incentive to provide this and additional non-consumption data, such as network data, to maximise their infrastructure investment.

4.37 In its submission Intellihub stated it supports distributors accessing data to help facilitate the ENA's Network Transformation Roadmap, aimed at supporting distributors when setting strategies and planning for significant changes in the electricity sector as consumers adopt new technologies.

Retailers

Retailers as the middle person for data requests

4.38 Retailers noted the issues they face being the middle person for data request between a distributor and MEP.

4.39 Trustpower stated it is concerned about retailers becoming a facilitator required to share this information as some retailers do not collect all of the information that a distributor might want from the meter.

4.40 ERANZ notes that beyond sharing consumption data, retailers have limited ability to improve the flow of data further because it simply is held elsewhere. *"There can be frustrations under current settings with market participants assuming that retailers hold all consumer data when in fact retailers only receive a set of consumption data from the ultimate data collectors and MEPs."*

4.41 Meridian stated it sees no barrier to distributors contracting with MEPs to access information about its LV network and not *"aware of any barriers in the Code and to the extend any barriers exist due to contractual arrangements with retailers, we would expect those to be easily overcome commercially."*

Q.2 What information do you need to make more informed investment and operation decisions?

Distributors

Types of information required

4.42 The types of information required by distributors to make informed decisions are the same as the current issues they face in trying to gain visibility of their LV networks. This includes smart meter data, historic data and real time data.

4.43 Distributors (see NEG, Counties Energy, Aurora Energy and Network Waitaki), note that smart meter data is required, however infrastructure does not currently support this. Without sufficient infrastructure and investment in place to future proof data needs, such as real-time data, this will impact a distributor's ability to respond to the future uptake of DER on their networks.

4.44 The NEG stated that regulatory settings are not supporting data digitalisation and the focus needs to be on identifying which regulatory settings are required for distributors to fully embrace digitalisation as quickly as possible.

4.45 Network Waitaki stated *"a large part of the national fleet of advanced meters appears to have been specified for retailer benefits only and presents a huge technical barrier for further applications."* Noting this is a prime example of inefficient investment by not having standards in place for advanced metering infrastructure that MEPs need to comply with.

4.46 Alpine Energy notes "*real time 'operational' information from smart meters has the potential to unlock significant consumer benefits in the form of more efficient and effective responses to network faults."*

4.47 Distributors suggested additional information that would be useful:

- Operational and power quality information including: last gasp, internal ripple relay status, voltage (max, min, average), kWh, kVa, power factor energisation status and harmonic levels data
- Metering information including: mass market interval metering, installation control points (ICPs) that subscribe to retailer time shift plans
- Large DER information including: location of EVs on the network and location of non-standard in home or on-route EV charger capacities.

4.48 Both Counties Energy and WEL Networks who have their own meters installed on the network (not 100 percent penetration) state it still needs access to remaining smart meters to have a full data set of network conditions.

Retailers

Types of information required

4.49 Retailers (see Trustpower, Meridian and Plains Power) suggest two-way flow of information with distributors providing information regarding network congestion and timely information when sharing network outages.

4.50 Trustpower also notes this two-way flow with distributors extends to default agreements stating *"an ongoing source of frustration for Meridian is the willingness of distributors to rewrite the recorded terms in their default agreements. This seems outside of what was*

contemplated from default agreements and erodes the efficiency gains that would otherwise be delivered by standardisation."

Other

Types of information required

4.51 Flexibility traders (Lightforce, Dervolution, Hiringa and solarZero) state they need access to information from distributors on their LV Network, noting congestion information on network demand would be useful in their operational decisions for current flexibility services and for future investment.

4.52 The Electricity Engineers' Association supports the kind of data distributors want and have suggested minimum requirements for this information. Minimum requirements ensures a baseline of information that enables a better understanding of capacity so distributors have a more effective response in their network planning and the possible use of non-network alternatives.

4.53 Transpower stated information is important to its role as Grid Owner and System Operator as information sharing between distributors and flexibility traders needs to be extended to the industry. As Grid Owner Transpower uses demand forecasts from distributor business to feed into Transmission Pricing Methodology calculations and to inform grid investments. Accurate demand forecasts will require distribution businesses to have a level of understanding of the volume and nature of existing and anticipated new DER on their networks. As System Operator, Transpower requires an understanding of the aggregate level of DER on the electricity network to maintain security and operate the grid 24/7.

MEPs

Types of information required

4.54 MEPs did not provide a response to information it needs.

Q.3 What options do you think should be considered to help improve access to information?

Distributors

Supportive of API

4.55 Distributors were supportive of establishing an Application Programming Interface (API) as access to data is a significant issue for them (see ENA, Vector, NEG, Orion, The Lines Company and Alpine Energy). Distributors noted that an API is considered a low-cost solution for data sharing arrangements compared with a central storage of data which would be expensive to maintain.

4.56 The ENA stated *"we support the options to make consumer information available and the need for a common communication language (API) so that data can be passed from consumer DER to flexibility service providers and EDBs."*

4.57 Orion stated the Authority should support out-of-market trials, with distributors and retailers and MEPs, for sharing of bulk real-time data with learnings shared with the industry. This would prepare the system better for when new participants emerge in the market.

4.58 Vector and Westpower raised concerns around obligations under the Privacy Act. While supportive of improved access to information but notes commitment to complying with these obligations. Westpower stated official industry-wide policy position needs to be reached that balances Privacy Act requirements with the data sharing necessary to allow effective DER management.

Retailers

Supportive of API

4.59 ERANZ is supportive of an API to enable data sharing and note publishing guidance for distributors to report on congestion through heatmaps will be beneficial. Similar to distributors, retailers noted accessing data through shared arrangements would be cost effective through an API rather than central data store.

Other

Supportive of API

4.60 Vector Technology Services stated it "*supports the principle of open access to data for all market participants, consumers and their agents (service providers) based on fair and reasonable terms."* Open access principle should be applied to smart meter consumption data, smart meter power quality data and network constraints and hosting capacity data. This option is also supported by Dervolution and Hiringa.

MEPs

Supportive of API

4.61 Vector Metering was the only MEP supportive of an API, stating it does "*not believe a CMDS is necessary to address the information issues identified by the Electricity Authority. Instead, we support the development of APIs that enable greater data access and authorised sharing, and interoperability between market participants."*

4.62 Flexible arrangements, such as the use of APIs, better enable innovation, rather than a centralised approach. A Central Meter Data Store (CMDS) is not conducive to future decentralised services, e.g. peer-to-peer trading, multiple trading relationships, distributed generation, standalone networks and a Consumer Data Right.

4.63 The development and day-to-day maintenance of a CMDS or repository and associated compliance costs are likely to be very costly, with risks of over-building and asset stranding. Consumers could pay for what they do not need or desire.

Distributors

Supportive of either API or CMDS

4.64 Some distributors were supportive of either an API or CMDS, noting that the Authority should explore shared data arrangements (see Aurora Energy, Northpower and Top Energy and Mainpower).

Retailers

Supportive of either API or CMDS

4.65 Some retailers (Flick Electric, Meridian and Genesis) noted their support for either an API or CMDS.

4.66 Meridian stated it would like to see more detail around the potential design and implementation of a CMDS or API arrangement.

Distributors

Supportive of CMDS

4.67 Counties Energy was the only distributor that encouraged the Authority to implement a CMDS, stating this would "*address the current issues around timeliness, standardisation and process with regard to access to data for distributed generation.*"

Distributors

Support for publishing congestion heatmaps

4.68 Heatmaps would assist in determining where there are capacity constraints on a distributors network and is supported by The Lines Company and Orion.

4.69 The Lines Company noted it is in the early stages of developing a congestion heat map and will work with MEPs, flexibility traders and other distributors to standardise the format of this information and its accessibility.

Other

Support for publishing congestion heatmaps

4.70 Lightforce, a flexibility trader stated a simple tool such as a heatmap can help them identify where congestion areas are and thereby set expectations regarding export limits prior to selling larger systems.

Distributors

Restructuring MEPs

4.71 Feedback from distributors focused on the structure of MEPs themselves as an area the Authority should look to for regulatory intervention. Options for restructuring MEPs included having 'data holders' and allowing distributor access information from MEPs directly (see Marlborough Lines, Aurora Energy, Mainpower and WEL Networks).

4.72 Feedback noted that MEPs as a participant are 'owners' of consumer data and the way the market is structured, MEPs are contracted to provide consumer data to retailers only, but other participants like distributors could also utilise that data for the ultimate benefit of consumers.

Retailers

Restructuring MEPs

4.73 Retailers also note the same issues as distributors and suggest distributors to have direct access to MEPs for data (see Mercury, Electric Kiwi and Nova).

4.74 Mercury stated that distributors require access to data that is not currently accessible from MEPs and the capex focused regulatory regime hinders the purchase of such data. *"We recommend the Authority refer this feedback to the Commerce Commission and the Ministry of Business, Innovation and Employment (MBIE) to speed up work in this regard."*

4.75 Nova stated that the capability of MEPs to provide a broader range of data services could be expanded and developed independently from the provision of meters and

associated supporting services to consumers via their retailer. The responsibility for data integrity is currently determined contractually between the retailer and their customer, but this could be replaced by the Code and thereby avoiding the complex questions over ownership of data and responsibility for its protection.

Distributors

Amended Data Template

4.76 Distributors suggest the Authority adopt the amended Data Template proposed by the ENA as this approach will ease current barriers and enable efficient flow of information (see Wellington Electricity, Orion and Electra).

4.77 Under this option the structure of ICPs was considered by Marlborough Lines who state having ICPs per meter register could allow for easier aggregation of export data and provide consumers greater choice.

Other options

4.78 Powerco suggested options in addition the ones proposed by the Authority:

1) *"The Commerce Commission's review of Information Disclosure is a natural starting point. For example, schedule 12b reports on forecast capacity. This could be evolved to reflect 'constraints' in a way that dovetails with the nature of the constraint(s) and factors affecting solutions."*

2) *"Meter data can support planning of distribution and transmission networks. In that light, an option is automated processes and standardised platforms/protocols for meter data management. Failing that, regulatory support to implement network monitoring and programs of rolling out network monitoring."*

Retailers

Data agent

4.79 ERANZ suggested that customers could nominate a "data keeper" organisation to act on their behalf rather than relying on retailers to serve as the middle person.

4.80 ERANZ references work under the Consumer Data Right by MBIE for a data agent or data keeper and stated *"consumers should have autonomy over their own data but currently have limited means of accessing anything other than consumption data. Having specialised data services could allow for access to a consumer's full suite of data rather than just the consumption data the retailer holds."*

4.81 Genesis stated consumers and persons authorised by them should be able to access their electricity consumption data easily, securely and in a timely manner.

Other

Other options

4.82 Lone Wolf suggested the Authority set up a data access working group comprising of distributors and MEPs and task the group with recommending actions to implement access to smart meter data by mid-2022 (at the latest).

4.83 The Community Energy Network stated it disagrees with the assumption made that household consumption information belongs to retailers who may then share it with distributors. Information from smart behind-the-meter demand management systems is clearly the property of consumers. Community Energy Network suggests a mandated

process for this would be a significant incentive for consumers and their communities to engage in demand management.

MEPs

Other options

4.84 Intellihub stated it does not support options presented by the Authority as it "*does not consider that there is any evidence that there are significant issues that need to be addressed by regulation, and therefore does not support either of these proposals. The proposals are significant and complex and would be unjustifiably onerous for the parties involved, for no clear benefit. We also consider that the proposals will have the unintended consequence of stifling innovation.*"

4.85 Rather, Intellihub considers data access to be a minor issue and supports informing and educating on consumption data requests. It encourages distributors to collaborate in finding the most efficient way of capturing and publishing utilisation data.

5 Electricity supply standards

This section presented a number of potential issues with electricity supply standards driven by increasing levels of DER.

Range of options to consider and comment on:

	Minor issue	Medium issue	Significant issue
Options	• Voluntary guidelines • Develop templates • Education and awareness	• Recommend standards templates • Threat of regulation • DER registry • Lay foundations for standards	• Mandatory uniform standards

Q.4 Have networks experienced issues from the connection or operation of DER?

5.1 Five submitters noted they had problems with the connection and operation of DER, but a number of submitters noted that this is also a future issue as both more and larger DER is being connected.

5.2 Three submitters partly, but not fully, agreed that they had a problem.

5.3 Eight submitters noted that they had not had a problem, and 32 submitters chose not to comment.

5.4 SolarZero commented that

"Our experience is that network voltages can exceed standards, even in the early hours of the morning. Voltage exceedances have caused some significant issues for solarZero, including inverters switching off, as they are meant to, during peak times which means that batteries cannot help offset peak demand. Voltages need to be within standard or the limits need to be lifted to levels that are common in other developed countries."

This indicates issues that distributors may not be aware of, as many do not have access to metering data to warn of high voltage.

5.5 Network Tasman noted that it

"…….has had issues with one solar PV installer that has repeatedly connected unauthorised PV to our network."

This clearly indicates a problem with the operation of Part 6 where enforcement would require disconnection of an entire ICP.

5.6 Network Tasman also noted an issue that is Standards related, is outside of the Authoritys powers to regulate

"DER installers are not captured by the Code and Energy Safety Services was reticent to respond when we advised of unauthorised injection on our network as there is no clear legislation or regulation prohibiting unauthorised injection."

Q.5 Do the Electrical (Safety) Regulations require review? If so, what changes do you think are needed (a) in the near term and (b) in the longer term?

5.7 This question is outside of the Authority's power to regulate or influence, however the non-alignment of Standards between the Code and the ESRs can create significant issues for distributors.

5.8 19 submitters agreed that there were issues with the ESRs to address, particularly the impact of out-of-date standards.

5.9 Five submitters recommended a change to the voltage threshold of +/-6% specified in the ESRs, to +10% - 6%, to allow more distributed generation (DG) to connect. Submitters noted that this was a common threshold in Australia.

5.10 Several submitters noted that the 4777 standards are six plus years out of date that MBIE should update as a matter of urgency, as well as keep them up to date going forward.

5.11 WEL Networks, similar to 4 other submitters, noted that

"…….the actual permissible operating envelope (especially the upper band of the voltage profile) needs to be reviewed by assessing the real impact of voltage increase. If the band can be extended without causing issues to customer connections, this will greatly improve the hosting capacity and enable non-network solutions to be employed."

5.12 The Authority has noted the issues with out-of-date Standards, and also the potential increase in network hosting capacity capability if there was an increase in the statutory voltage limit. These two issues will be referred to MBIE for consideration.

Q.6 Does Part 6 remain fit for purpose? If not, what changes do you think are needed (a) in the near term and (b) in the longer term?

5.13 23 submitters agreed that Part 6 needs a review and should have a further connection process for larger scale DG added.

5.14 A further five submitters partly, but not fully, agreed that Part 6 should be reviewed.

5.15 No submitters disagreed with a review of Part 6, but 20 submitters chose not to comment.

5.16 Five submitters also suggested that Part 6 of the Code should be expanded to include an application process for all DER in addition to DG.

5.17 There was very strong agreement to a review of Part 6. Several issues and suggestions made within the submissions need to be considered within the review, in particular:

- Review the fees and time periods for distributors specified in the application processes
- Provide more enforcement power for distributors who locate illegal DG connections
- Add an application process for generators above say 1MW
- Review the incremental pricing approach specified within Part 6. Top Energy and Northpower submitted a single submissions, and recommended significant extension to the Part 6 process:

"New processes should be workshopped with industry participants and potential applicants, and the processes to apply to EDBs and applicants closely aligned with Part 8 and Transpower's System Operator requirements for embedded generation over 1MW. The current Transpower processes appear to run separately but in parallel to network processes.

Clarification on Transpower's responsibility for, and the co-ordination of, large scale DG over 10MW would be beneficial as it is currently disjointed and potentially results in different approaches across different networks. We would support all DG over 10MW required to be dispatched by Transpower for improved transparency, rather than the current optional approach which is vague and unhelpful.

The above should be a priority as EDBs are seeing significant uplift in enquiry around large scale generation, much of which is in the 10MW-100MW range. Effectively, integrating this new generation will be essential to achieving New Zealand's zero carbon ambitions."

Q.7 Is there a case to be made for minimum mandatory equipment standards for DER equipment, specifically inverter connected DER?

5.18 23 submitters agreed that there needs to be minimum mandatory standards set for DER equipment, two of these submitters indicated that there is urgency to do this.

5.19 A further six submitters partly, but not fully, agreed that there should be mandatory DER standards.

5.20 No submitters disagreed with mandatory standards, but 19 submitters chose not to comment.

5.21 There was very strong agreement to mandating or at least creating DER standards, including:

- Vehicle to grid standards
- Update to existing power quality standards
- Sensible autonomous behaviour of DER
- Connectivity and visibility of DER
- Remote control or DER
- Flexible markets
- Fault ride-through capabilities
- Interoperability and cyber security
- Anti-islanding
- Protocols and communication interfaces
- Demand response capabilities
- Mandating the voluntary EV charger standards, however the Authority currently cannot regulate EV owners or installation technicians.
- The Northern Energy Group warned that the development of standards needs to be carefully considered:

"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."

Q.8 What standards should be considered to help address reliability and connectivity issues?

5.22 A list of suggested standards is provided in the notes above on Q7, some of these relate to reliability and connection

5.23 10 submitters agreed that this is an issue.

5.24 11 submitters partly, but not fully, agreed that this was an issue.

5.25 No submitters disagreed, but 26 submitters chose not to comment.

5.26 The Lines Co noted that:

"Our observation is that the electricity industry and regulatory framework in New Zealand is slow to migrate standards into regulatory framework comparative to other markets like Australia. We need to do better at this to avoid deployment of technology that is moving faster in its development than the regulatory framework can match.

We support the development of mandatory standards for key technology (such as common protocols for control of EV chargers) to avoid technology lock out……..

We agree with the NEG that the EA needs to strike a balance between mandatory and voluntary standards, which is challenging, and we also encourage development of standards that provide minimum thresholds – this ensures a floor but still enables those that want to innovate more to do so."

Q.9 Is there a case to look at connection and operation standards under Part 6 with a view to mandating aspects of these standards?

5.27 17 submitters agreed that the connection and operation standards should be mandated, or have at least guidelines.

5.28 One submitter partly agreed.

5.29 Six submitters disagreed considering that there was not a current problem. A further 24 submitters chose not to comment.

5.30 Vector noted:

"The minimum connection requirements for DER should be supported by default standard arrangements which should be able to be overridden by bilateral arrangements, if required (see our response to Theme 4).

We note that electricity supply standards along these lines and a supporting registered agent role have been established in South Australia for residential solar PV. This is in response to the oversupply of solar energy and minimum demand conditions that threaten security of supply in the state."

Comments on a DER registry

5.31 11 submitters considered that DER transparency is required, a number suggesting adding the functionality to the registry.

5.32 No submitters agreed partly or disagreed, but 37 submitters did not to comment.

5.33 Orion supported a DER registry, and also noted issues recording DG currently in the registry:

"Attention to a DER registry is a matter the Authority should be considering on its own data and digitisation roadmap. We support any education and guidance that helps the sector to understand requirements on them and the part they need to play in the supply chain……. We support a mandated DER registry. We submit that it is timely to review the way in which DER can be recorded in the Registry. Are we recording inverters connected or DER connected? If we are recording inverters connected this can be a one to many relationship (e.g. inverter to solar and battery) or a many to one relationship (e.g. inverter to solar, inverter to battery and inverter to electric vehicle). Is it important to know how many kW are connected of each type or is it still appropriate to aggregate the total? The controllable device is the battery, but these are currently loaded as 'other' so become less traceable."

6 Market settings for equal access

The potential problem to test was two-fold:

- *Distributors may favour network solutions when non network solutions could be a more efficient option. This means opportunities might be missed to support climate targets and decrease distribution costs.*
- *If distributors do decide to invest in DER, they may be more likely to favour in house investment, or use subsidiary firms, rather than follow a competitive procurement process. Flexibility traders are not able to compete on an even playing field, discouraging market entry and competition. DER controlled by a distributor is also likely to get locked in as a distribution alternative, rather than being allocated to its highest value use.*

Range of options for incentivising non-network solutions when are more efficient than network solutions to consider and comment on:

	Minor issue	Medium issue	Significant issue
Options	• Education on flexibility services • Require distributors to disclose progress • Publish a comparative report	• Fund trials • Distributors required to prove that they have fully explored flexibility	• Link distributors' regulated revenue to their progress in developing the use of flexibility services

Range of options for increasing competition for flexibility services to consider and comment on:

	Minor issue	Medium issue	Significant issue
Options	• Education on competitive procurement and coordination • Procurement guidelines	• Enable multiple trading relationships • Assess cost allocation rules • Assess related party transaction rules • Encourage distributors to make available 'standing offer' price information for DER	• Competitive tenders for flexibility services • Restrictions on distributors owning or operating DER

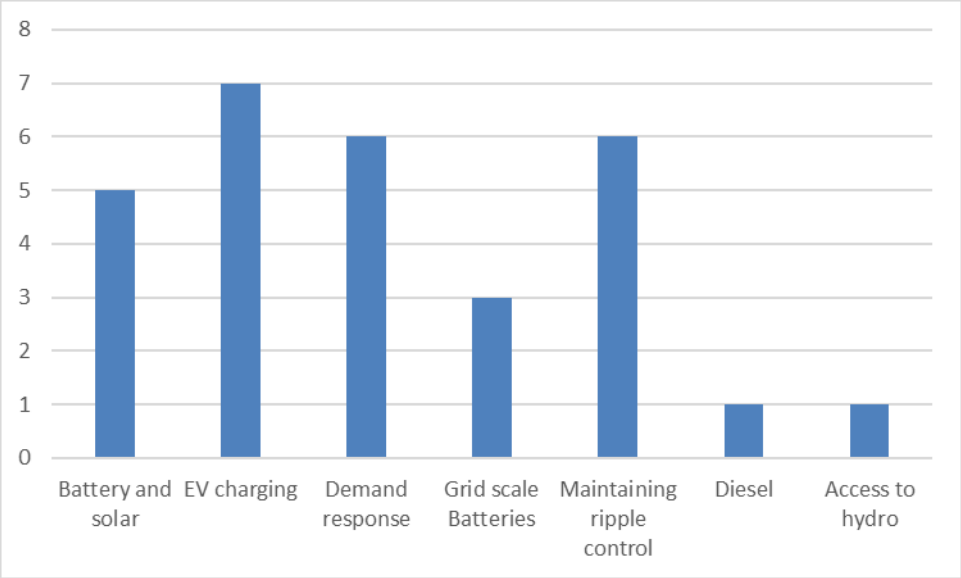
Q.10 What flexibility services are you pursuing?

Distributors

6.1 Distributors noted 29 flexibility projects being pursued or considered. Figure 3 breaks down the type of flexibility services being considered or pursued. Projects and trials involving EV charging was noted by seven distributors.

6.2 Distributors expressed how important ripple control was to the network. Unison and Centralines expressed concern that distributors were not incentivised to ensure effective maintenance and integrity of these systems.

Figure 3: Flexibility projects being considered or pursued by distributors



- *"TLC is working with Ngāti Maniapoto to deploy DER in concentrated areas where solar production can be optimised, and where the network is used to enable access to those concentration points*" (The Lines Company).
- Wellington Electricity is trialling "*the use of solar/batteries to provide additional security of supply and capacity support"* (Wellington Electricity).
- *"The focus should be on DR from EV charging and hot water. Other flexibility services for residential may be wasted"* (Wellington Electricity).
- *"Ownership of hot water relays is for the most part aligned with meter ownership. We are concerned that retailers and MEPs are not incentivised to ensure effective maintenance and integrity of these systems and the associated information needed to provide visibility of them"* (Unison and Centralines).

Retailers

6.3 Two retailers noted flexibility projects being pursued (Meridian and Simply Energy). This included plans to install EV chargers, battery storage, demand management projects, and responses to Transpower's RFP for voltage management and Powerco's RFP for network support in the Coromandel.

- *"Meridian has announced our intention to develop a nationwide network of more than 200 EV chargers that we will install within the next three years. Meridian is also planning to invest in a 100MW battery in the North Island"* (Meridian).

6.4 *"As an independent retailer we have an important part to play in delivering practical and customisable flexibility services to our customers, orchestrating DER to minimise both cost and emissions"* (Electric Kiwi).

6.5 Simply Energy said they are pursuing a range of flexibility services, including:

- Interruptible Load / Reserves
- Previous participant in the Transpower demand response program
- Wholesale electricity market demand response through Contact
- Transpower RFI/RFPs, eg recent Upper North Island voltage management RFI
- Network RFI/RFPs, eg Powerco network support options for the Coromandel region
- Demand management to reduce consumer electricity and network bill charges
- Demand management to support electrification projects
- Potential AUFLS provider of hardware and software services.

Other

6.6 Seven submissions noted flexibility services being pursued (solarZero, Hiringa, DERvolution, Transpower, Plains Power, CEN, and IEGA). The types of flexibility services included demand response, solar and battery projects, and hydrogen storage solutions.

6.7 Transpower noted that as the Grid Owner, it actively considers flexibility services as non-network alternatives for grid investment as part of the guidelines set by the Commerce Commission (Commission). As System Operator, it also considers flexibility services that can be procured for ancillary services whilst its Grid Owner function can use the same resources for outage management.

6.8 Four submissions noted barriers to pursuing flexibility services (DERvolution, SEANZ, Bryan Leyland, and Hiringa). This included a 'chicken and egg' problem with distributors not seeing sufficiently available resources to rely on and flexibility traders not having certainty that their resources will be used if they invest. Another barrier mentioned was the fragmented nature of the industry, flexibility was not invested in because the value cannot be captured by a single entity.

- *"Distributors do not see sufficient flexibility available to rely on, and see it as a not-quite ready yet solution; and flexibility suppliers do not have sufficient certainty their capability will be used to underpin the required investment, and so cannot commit flexibility resources"* (DERvolution).
- *"As Grid Owner, we actively consider flexibility services as non-network alternatives for grid investment. This is part of the guidelines set by the Commission. Non-network solutions are close to becoming economic compared to traditional grid investment"* (Transpower).
- *"More investment in DER would occur if flexibility services become a feature of network management and operation"* (SEANZ).
- *"The fragmented nature of the industry means that something that benefits almost every aspect of the industry has a value that no single entity can capture"* (Bryan Leyland).

Q.11 Are flexibility services being pursued through a competitive process?

Distributors

6.9 Two flexibility projects were or are in the process of being pursued through a competitive process. This includes Aurora's Upper Clutha project and Powerco's project where they are also in the process of competitively procuring flexibility services in the Coromandel.

6.10 Top Energy and Powerco noted that they have attempted competitive procurements previously and have been unsuccessful.

6.11 Five distributors commented that the flexibility service market is still in its infancy with little opportunity to procure cost effective services competitively. However, distributors commented that they will procure flexibility services once it is economically viable and "*that they are incentivised to seek the best solution."*

- *"Top Energy completed a formal expressions of interest exercise to provide the diesel generation and/or alternative services. However, all external parties required Top Energy to maintain ownership of the existing diesel generation in addition to their non-network solution, which was highly inefficient and highlighted that no alternative market existed at that point*" – Top energy.
- Powerco stated *"we are partway through a process seeking network support in the Coromandel region." (Powerco)*
- *"We have pursued several ROI opportunities in the past but unfortunately have not had responses from suppliers to allow us to pursue a non-network solution"* (Powerco).
- *"As the flexibility services market is still in its infancy, it has been impractical for WEL to procure any flexibility service as yet"* (WEL Networks).

Retailers

6.12 Simply Energy is the only retailer that noted responding to competitive procurement for flexibility in its submission. Simply Energy have responded to both Transpower's RFP for voltage management and Powerco's RFP for network support in the Coromandel.

Other

6.13 Four submissions noted a perceived preference for distributors to pursue network solutions. A submission noted that while trying to offer flexibility services, distributors defaulted to standard pricing terms, standard agreements, and network upgrade solutions. Another submission noted that the competitive process is currently inhibited by uncertainty about who should bear the costs of upgrading lines capacity and proposes a mandate that ensures that a distributor can charge a DER owner only for the cost of building the capacity that the DER needs.

6.14 However, one submission said they had positive experiences with distributors who appear to be operating under normal commercial conditions.

6.15 Transpower noted that it always pursues flexibility services through a competitive process. These services are defined by a Grid Support Contract (GSC). Transpower does not seek to directly own or interact with the individual resources themselves.

- *"All distributors to date have defaulted to standard pricing terms, standard agreements and network upgrade solutions rather than non-network solutions"* (Hiringa).

- *"The slow progress in the development of flexibility services is a significant issue (using the minor to significant framework in the document). Lines companies should be encouraged and incentivized to explore and learn how to deploy flexibility services"* (solarZero).
- *"The connection fees should be publicly disclosed and, if necessary, subjected to regulatory adjustment"* (CEN).
- *"There are examples of distribution companies preferring distribution solutions without discussing if the distributed generation could make a lower cost investment that achieves the same outcome"* (IEGA).

Q.12 What options should be considered to incentivise non-network solutions?

Distributors

6.16 Seven distributors thought it was too early to consider the regulatory options presented. Distributors urged the Authority to ensure regulation is flexible to the changing environment and take a 'no-regrets' approach.

6.17 For the option of distributors requiring to prove that they have fully explored flexibility, six distributors said they regularly consider non-network alternatives but that they are usually not economically viable. One option put forward was to include investment tests in annual IM disclosures. The submission said that this would not be burdensome as the distributor already carries out this assessment.

6.18 Distributors pointed out that considering non-network solutions is already a requirement with the Commission and is included in their Asset Management Plan (AMP). It was noted that commercial providers of non-network solutions can identify possible opportunities in the AMPs for their services and present them for consideration. It was recommended that concerns about non-network options could start with looking at the nature and scale of non-network solutions considered in AMPs.

- *"As EDBs are already undertaking these tests as part of evaluating investment decisions, we do not consider that including information in disclosures would be overly burdensome."* (Northpower and Top energy)
- *"…currently there is a lack of viable tested solutions known and available to consider and implement. As a result, EDB's have a tendency to favour in-house solutions."* (PowerNet)

6.19 No distributors thought that regulated revenue should be linked to their use of flexibility services. However, 10 distributors commented that the current funding model could be improved. Key points raised included:

- The innovation allowance not being sufficient (noted by Alpine, Trust Horizon, PowerNet, and Vector)
- No forthcoming revenue allowance for flexibility procurement cost because opex allowances are backwards looking, and
- There is no direct budget for purchasing flexibility services.

6.20 The Totex mechanisms in the United Kingdom were highlighted as an example where capex and opex allowances have been equalised to remove preferences for capital expenditure or for purchasing flexibility services.

- *"…no revenue allowance would be forthcoming to cover the procurement cost because opex allowances are backwards-looking*" (Unison and Centralines)
- *"The nature of the DPP regime can make it challenging for distributors to recover significant 'step changes' in expenditure to meet new obligations or government or community expectations... the AER has recently published several guidance documents on how it will assess DER integration expenditure"* (Vector)

Retailers

6.21 Two retailers did not note support the more 'light touch' interventions including education and comparative reports (Flick and Simply Energy). They commented that these interventions would deliver results while other retailers did not comment on these options specifically.

6.22 Two retailers suggested that the Authority consider contestable funds for trails as a way to incentivise innovation with learnings being shared with other distributors (Flick and Simply Energy). Simply Energy suggested considering what has worked well in other jurisdictions, including ARENA in Australia.

6.23 Three retailers supported distributors providing more proof that they have considered network solutions (Simply Energy, Trustpower, and Mercury). These retailers all noted that the assessment would need to be fit for purpose and only apply to projects over a certain size. One retailer noted that distributors are already required to prove they have investigated non-network solutions in their AMP.

- Flick does not support *"proposals that involve 'educating and informing' – this type of approach is unlikely to be sufficient to motivate change."* (Flick)
- *"Mercury submits that sufficiently large network investments should be subject to net benefit test requirements akin to Transpower's $20m "major CAPEX" threshold and as seen in other jurisdictions such as Australia."* (Mercury)

Other

6.24 Five parties expressed support for learning through trials (VTS, IEGA, SEANZ, CEN, and DERvolution). Submissions advocated contestable funds for distributors, with permission to operate outside of the default market arrangements for a period of time. Submissions emphasise a need to make the results public so that the learnings are captured throughout New Zealand and all consumers benefit.

- *"CEN believes that the development of pilot projects, using innovative technologies and models of delivery will provide critically important insight for the EA and the sector."* (CEN)
- *"A learning-by-doing process moving from pilots and trials to product testing… Essential to the learning-by-doing process will be obtaining a social licence for access to consumer DER. Energy Consumers Australia has highlighted the role of a social licence for control of DER in a successful transition."* (DERvolution)

6.25 Three parties suggest that improvements should be made to the current process of assessing non-network solutions (IEGA, solarZero and Hiringa). One submission said that in their experience, distributors have little appetite or incentive to implement non-network solutions over network solutions. To improve the current process, options recommended included:

- A review of mechanisms overseas to incentivise non-network solutions

- AMPs to be peer reviewed and gives examples of AMPs that may underestimate the impacts of EV charging and another that may overestimate the costs of DER
- Use standard values for comparators of network verses non-network solutions. For example, for the value of reliability or increased risks.

6.26 One submission said that all the distributors they interact with are costly seeking the lowest cost option and there was no need for intervention (Lone Wolf).

6.27 Five submissions suggested that a new funding model is needed (Bryan Leyland, SEANZ, DERvolution, solarZero, and Enel X). Submitters expressed that input methodologies need to provide more explicit support (via financial incentives or obligations) for network operators to do the extra work. This is needed to evolve investment and operating practices to fully leverage the capability and value of DER and flexibility services. One submission stated that because of regulation, distributors can make money from overbuilding their system, but not from managing peak demand.

- "…*because of the way the regulations work, they (distributors) can make money from overbuilding their system, but not from managing peak demand."* (Bryan Leyland)
- *"Another option that could be explored is an allowance program similar to the demand management incentive allowance applied to distributors in Australia's NEM."* (Enel X).

6.28 Options for different funding models put forward in submissions included:

- Creating a new performance-based regulatory framework
- An allowance program similar to the demand management incentive allowance applied to distributors in Australia's NEM. This program allocates a certain percentage of revenue for distributors to spend on exploring flexibility options
- Rewards for lines companies that are early adopters of flexibility services.

Q.13 What options would encourage competitive procurement processes for flexibility services?

Distributors

6.29 Two distributors feel that existing requirements are adequate, and no further intervention is needed to encourage competitive procurement (PowerNet and Vector).

6.30 Three distributors support developing a tender platform to procure flexibility services (Trust Horizon, North Power and Top Energy). Through the tender platform, participants could advertise their flexibility requirements and providers could tender to provide solutions. For the option of procurement guidelines, TLC said that they would support industry led procurement guidelines for flexibility while Wellington Electricity said there was no need as they already have procurement processes in place.

- *"Options such as providing a common demand response and trading platform (as well as standardising contracts/service offer parameters) would over time reduce costs and create service/price discovery and transparency."* (Trust Horizon)

6.31 Three distributors support enabling multiple trading relationships and suggest that this will require significant redrafting of the Code based on their experiences (Wellington Electricity, Wel Networks, TLC). The Authority is urged to use a consumer lens if it pursues this option.

6.32 Nine distributors have suggested that the cost allocation rules, and related party transaction, do not need to be assessed as they are already audited and transparent. However, Powerco's submission says that assessing these rules could be a natural starting point for assessing any concerns about cost allocation and competitive procurement and making the rules better understood.

6.33 No distributors support completely restricting distributors from operating or controlling DER. They state that it may be more efficient for distributors to operate flexibility services directly in some cases and security of supply could be an issue if distributors do not have the ability to control the demand of some large connections. However, two distributors expressed support for market testing projects bigger than a certain threshold (Aurora, Powerco). West Power noted that a potential business model is for distributors to own but not operate DER.

6.34 Other points raised included the importance of digital and data-based platforms which will be fundamental to enabling dynamic DER management. Distributors also raise that impacts on equity should be considered with any policies to incentivise DER, stating that the benefits of flexibility do not flow to consumers who are unable to participate and who can least afford it.

- *"We think a pragmatic and cost-effective starting point is for market-testing be applied to projects over a cost threshold eg $5m*." (Powerco)
- *"…it is critical that distributors are not unnecessarily hindered from utilising the knowledge and experience they have of their own networks"* (Wel Networks)

Retailers

6.35 Two retailers noted barriers to multiple trading relationships (Meridian and Simply Energy). This includes the costs outweighing the benefits and suggested there were different avenues available to deliver the same outcomes. Simply Energy submits that this option is reliant on flexibility traders needing to become retailers which would restrict market entry. It is suggested that the Authority consider the wholesale demand response mechanism which has been developed in Australia.

6.36 All retailer submissions supported creating a level playing field for flexibility services:

- Two retailers support standing offers for flexibility services as a method of lowering the barriers to entry into the market (Simply Energy and Mercury)
- Two retailers supported mandatory competitive tenders for flexibility services
- Three retailers recommended considering arms-length rules for distributors participating in the flexibility market (Flick, Meridian,
- Three submissions noted that distributors owning and operating DER could distort the market and lead to competition issues (Nova Energy, Simply Energy, and ERANZ). One retailer noted that they did not think a competitive market could occur with current ripple control arrangements and with distributors developing DER management systems to directly control DER. Another retailer submits that as long as distributors participate in DER the opportunity for any third party to build scale is reduced
- One retailer expressed that arm's length rules and ring-fencing requirements are more likely to promote competition if applied to the large incumbent vertically-integrated gentailers (Electric Kiwi).

- Mercury recommends "*Better access to information including "standing offer" price data would encourage market participation and lower the likelihood of in-house investment and ensure the highest value allocation of DER"* (Mercury)
- *"Distributors are both regulated monopolies and have commercial arms operating in competitive markets, giving rise to the potential to distort nascent markets and reduce competition."* (ERANZ)

Other

6.37 Four parties expressed support for competitive procurement processes (Transpower, IEGA, SEANZ, and Enel X). Parties called for competitive tenders and clear pathway to access different value streams. This included how flexibility can access the energy and reserve markets will be important, noting that this was needed even if out of scope of this work stream.

6.38 Submitters said that market settings need to provide clear signals, visibility and transparency between buyers and sellers of flexibility to inform long and short-term investment and operational decision making. Industry collaboration was recommended as a way to develop flexibility services product specification which would facilitate the procurement process of flexibility services.

6.39 Three parties expressed support for multiple trading relationships, peer to peer trading, and pricing that accurately values flexibility resources (Hiringa, CEN, and SEANZ). A submission stated that enabling multiple trading relationships is key to removing barriers to flexibility services and encouraging competition. Multiple trading relationships was said to strengthen incentives on retailers to set import charges which align with volume-related costs and to set export prices which reflect the actual value of the exported power.

6.40 Submissions expressed mixed views on restricting distributor ownership of DER. CEN stated that while distributors can own DER, this deters investment from third parties. Lone Wolf argues that there is no reason that distributors should not invest in DER or for the Authority to promote independent traders over distributors. Bryan Leyland puts forward that the main regulatory problem is that distributors are not able to recover costs from managing load.

- *"If distributors are allowed to own, operate and control DERs, including trading of DER flexibility, they would have strong conflicts of interest that would deter investment by potential operators of independent DERs."* (CEN)
- "While there has been engagement between Transpower and the IPAG to capitalise on the learnings of our initiatives, we believe that going a step further and having an industry working group, including industry participants, regulators and policy makers is a good avenue to adopt a "learning by doing" approach, generate learnings and to develop best-practice guidelines." (Transpower)

7 Operating agreements

The potential problem to test was that the transaction costs of arriving at a suitable operating agreement that meets the requirements of both the flexibility trader and the distributor may be high, and present either:

(a) A barrier to entry for a flexibility trader whose service could provide a non-network alternative that results in benefits to consumers
(b) A cost of procuring flexibility that deters distributors from seeking non-network alternative solutions, and ultimately missed benefits to consumers.

The range of options to consider and comment on were:

	Minor issue	Medium issue	Significant issue
Options	• Develop guidance for operating agreements	• Establish a 'DDA style' agreement which parties can opt in to	• Establish a mandatory set of terms that parties must use

Q.14 Have you experienced difficulties with negotiating operating agreements for flexibility services?

Distributors

7.1 15 distributors submitted on this question.

7.2 10 of these submitted that they have had little to no experience in negotiating agreements, so were not able to provide any informed views on this question.

- Two said that approaches from third parties are often speculative at this early time and have not reached contracting stages yet (ENA and Vector)
- One said that their negotiations have so far focussed on supporting a trial on their network, but offered no comment on the experience of this negotiation (Wellington Electricity).

7.3 Five submissions have had varied experiences:

- Three said that they experienced no difficulties in this area, or the negotiations have been straightforward (Electra, Alpine and The Lines Company)
- One said that they have successfully contracted for voltage support during outages, however, recognises the maturity level of the contracts underpinning these arrangements needs to improve (Mainpower)
- One expressed concern that the materiality of transaction costs is overstated, especially when viewing the transaction cost against the overall value of the related network investment (Aurora).

Retailers

7.4 One retailer citied experience related to this question and stated their experience was in seeking commercial terms for flexibility opportunities via the smart EV chargers this retailer is working to roll out. They found that despite this distributor agreeing with the value of the offering, they have not been especially interested in negotiating contract terms to reflect this (Meridian).

7.5 One retailer, while they did not note any specific experience in offering flexibility services to networks, gave an example of inequal bargaining power where a distributor mandated an approach that meant only its meters could be used on its network (Trustpower).

7.6 One retailer responded that they have not as of yet experienced difficulties (Plains Power).

Other

7.7 Five 'other' parties submitted on this question:

- Three parties submitted that there is in general very limited experience in negotiating operating agreements for flexibility services, while the New Zealand market is still immature.
    - One submitter went further to say that a standardised approach to flexibility management systems is the most important element to address, before enabling operating agreements.
- One submitted that their understanding of their required contractual structure has developed as their maturity has increased (Transpower).
- One submitted that they have not been able to negotiate an agreement with distributors despite offering multiple flexibility solutions (Hiringa).

Q.15 Are the transaction costs of developing contracts a barrier to entering the market for flexibility services?

Distributors

7.8 13 distributors submitted on this question. Of these:

- One submitted that the legal costs, based on experience with large DER contracts, could be significant, reflecting the issues of risk and liability.
- 10 submitted that the costs were not a barrier for flexibility services entering the market. Some of the comments supporting this view were:
    - *"the inability to deliver the service to requirements can be a barrier to entering the market. This isn't a transaction costs issue"* (Powerco)
    - *"we currently have a contract in place, and it appears to work well given the rate of uptake and lack of amendments or conflict, during or after the contracting process"* (Electra).
- Two submitted that the initial costs may be high for both sides, but anticipate these to reduce as the arrangements for flexibility services become more mainstream:
    - *"we do agree that transitional costs may be higher initially as trials and pilot services are tested and refined"* (Wellington Electricity).

Retailers

7.9 Five retailers submitted on this question:

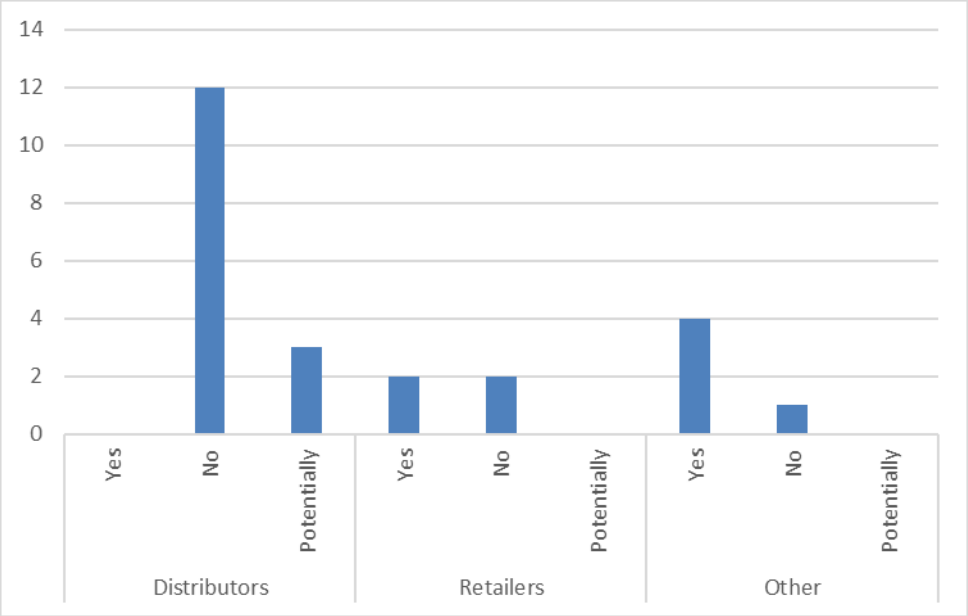
- Four agreed that transaction costs of developing contracts could be a barrier to market entry (ERANZ, Mercury, Meridian and Trustpower).
- One viewed associated transaction costs to not present a barrier as yet (Plains Power).

Other

7.10 Four 'other' parties submitted on this question. Of these:

- Two submitters agreed that the transaction costs could be high.
- Two submitters viewed associated transactions costs to be potentially high, but these would be likely to reduce as industry learns, or thought this was a minor issue:
  - *"a secondary issue compared to the immediate barrier represented by the regulatory settings…creating a bias towards traditional asset management solutions"* (Dervolution)
  - *"as industry learns these costs are likely to reduce. The key point is for lines companies to start using flexibility services*" (Solarzero).

Q.16 Would an operating agreement help lower transaction costs and level negotiating positions?



Distributors

7.11 15 distributors submitted on this question. Of these:

- 12 distributors viewed that a standardised operating agreement would not lend itself to lowering transaction costs or levelling negotiation positions.
  - Five of these submitters further noted that the costs associated with establishing such an agreement are likely to be significant and result in consumers paying for services that are not required.

- *"agreeing an operating agreement upfront is a relatively minor cost in the overall cost of integrating a new type of supplier and technology into a network's operating model"* (Northpower and Top Energy).

- Three distributors (Counties Power, Powerco and WEL Networks) said a standardised agreement might be helpful in lowering transaction costs. However, these submitters also noted the consequences of standardising agreements too soon:
  - *"we expect it would increase costs to consumers if inadequately specified from rushing it"* (Powerco)
  - *"standard operating agreements are likely to unnecessarily stifle innovation in the flexibility services market"* (WEL Networks).

Retailers

7.12 Four retailers submitted on this question. Of these:

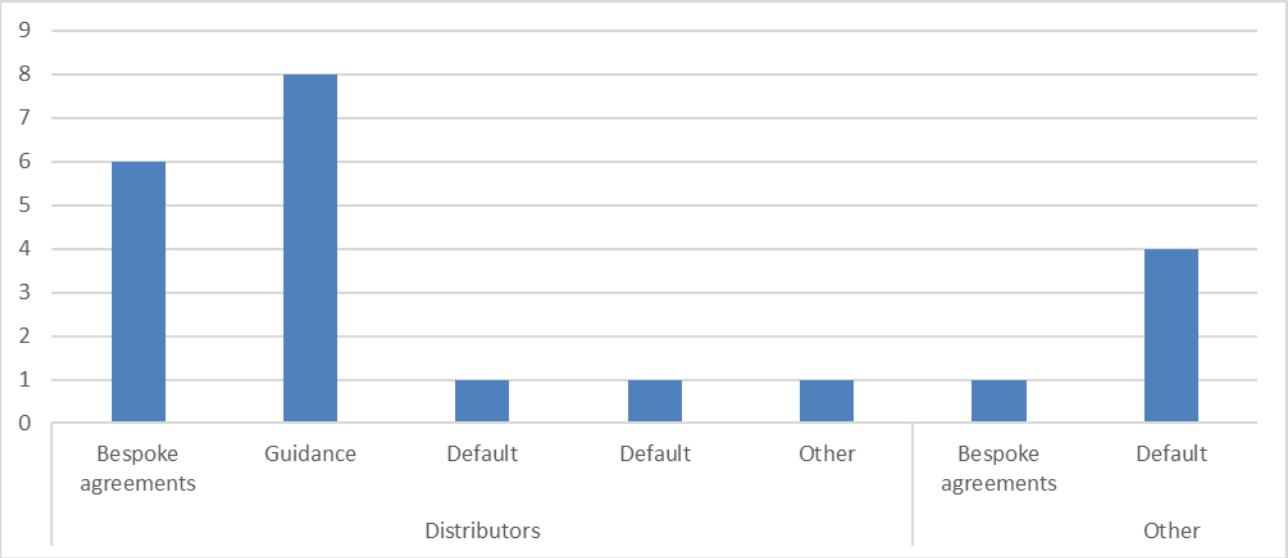
- One retailer submitted that they did not think that a standardised operating agreement would address the issue.
- Three retailers submitted in agreement that a default operating agreement template to help lower transaction costs faced by new entrants.
  - One of these however (Mercury) added that investment in producing a standard agreement at this time would be specious when little is understood about what is practically involved.

Other

7.13 Five 'other' parties submitted on this question. Of these:

- Four stated that yes, a standardised agreement could potentially lower transaction costs.
- One (Dervolution) viewed that no, a standard agreement would not lower transaction costs. Standard terms of trade of flexibility services will emerge with more experience.

Q.17 What kind of operating agreement would address the issues described in this chapter?



Distributors

7.14 15 distributors submitted on this question. Of these:

- One submitted that a default agreement with room for parties to agree to alternative terms would appropriately address this issue (Counties Power).
- The remaining 14 distributors either supported leaving industry to continue to negotiate bespoke contracts (six) or Authority and industry working to produce some level of guidance on operating agreements (eight).
- Of the eight distributors that felt guidance issuance was an approach more suited to the issue, their specific suggestions ranged from:
    - Guidance of best practice terms that may be voluntarily adopted
    - Disclosure of agreed flexibility terms by distributors
    - distributors to share the structure of their contracts with others voluntarily
    - Principles-based guidance
    - Any guidance to be developed through close industry collaboration.
- Of the same 14 distributors who supported a more minor intervention or no intervention, several also described the risks of introducing default or mandatory terms as:
    - Locking parties into unsuitable arrangements
    - Interference with existing agreements
    - Costs of development outweighing the benefits to consumers.

Retailers

7.15 Two retailers submitted on this question. Of these:

- One retailer suggested it would be more appropriate to regulate the process that needs to be followed in negotiation, including a means of resolving disputes.

- One retailer suggested a default contract could address the issue but noted the diversity of service types. This retailer suggested the default contract could focus on minimum common elements.

Other

7.16 Five 'other' parties submitted on this question. Of these:

- Four submitters said that they would support default arrangements to address this issue.
- One submitter viewed to avoid early-stage standardisation: *"we see a need for some standardisation, but at this early stage we also see a need for innovation that should not be constrained by early-stage standardisation"* (Solarzero).

8 Capability and capacity

The potential issue identified was that having 29 distributors is not necessarily the most efficient way to structure the distribution sector in New Zealand. This potential inefficiency may become pronounced as distributors have to adjust to network transformation due to the complexities of integrating DER and the electrification of the economy. An inability for some distributors to adjust may lead to not all consumers benefiting from the changes in technology and innovation happening on distribution networks.

Range of options to consider and comment on:

	Minor issue	Medium issue	Significant issue
Options	• Encourage collaboration • Improve transparency of investment decisions • Develop a reporting framework for distributors and DER suppliers to report results of trials	• Impose price quality regulation on all distributors • Clarifying the roles of a distribution network operator (DNO) and a distribution system operator (DSO) • Create industry body to body would promote coordination of DSOs • Encourage joint-venture arrangements	• Adopt a single DSO model

Q.18 How are distributors currently working together to achieve better outcomes for consumers?

Distributors

8.1 All submissions from distributors provided information on different initiatives being progressed. These initiatives included:

- Developing a strategy and roadmap for network transformation
- Developing prototype models needed for a future with more dynamic network operation
- Installing Ineida LV monitors in our distribution transformers.
- Eberle Power Quality meters at our zone substations
- participation in the EPRI power quality research
- EV hasting capacity studies
- Reviewing designs for LV network reticulation
- Commissioning a survey of non-electric thermal boilers on our network.
- Development of ripple control of batteries
- rebuilding our information platform to support future focused distribution system operator (DSO) capabilities

- participating in key working groups
- updating connection and operation standards.

8.2 Three distributors noted that funding and regulatory support is needed to deliver the capability needed. They also noted that not all distributors will need the same level of capability as DER uptake is likely to be much slower in more rural and lower socio-economic areas.

- *"We have a clear strategy, completely refreshed in 2020, and our commitment to the energy transition is best illustrated through our strategic focus areas."* (Network Waitaki).
- *"We believe we are making good progress on defining what capability and capacity we need to deliver the climate change driven increase in demand. However, we now need the funding and regulatory support the deliver that capability."* (Wellington Electricity).
- *"…we are comfortable that we have the capacity and capability to meet the challenges of a more complex energy environment"* (Unison and Centralines).

Other

8.3 Submissions expressed mixed views on whether distributors are doing enough to manage electrification. Three submissions suggested that distributors were showing innovation and are prepared for network transformation.

8.4 However, three submitters refer to distribution progress as being slow. Comments included seeing very little tangible efforts to use innovative approaches and that there is a strong tendency for distributors to defend legacy assets which is delaying sector transformation. Another submission said that while trying to establish flexible demand across multiple networks they had found different levels of capability and capacity leading to inefficiencies.

8.5 One submitter called for disaggregating performance measures to get a more accurate understanding of quality across customer types and locations. Another suggests that for trust owned distributors, an appropriate response is to make sure communities have access to sufficient information to determine whether the business is being operated as a successful company and whether shareholders and communities have sufficient opportunity to influence the strategic decisions regarding the company.

- *"At this stage, an appropriate response to concerns regarding distributor capability is to make sure shareholders and communities have access to sufficient information to determine whether the business is being operated as a successful company"* (DERvolution).
- *"we are seeing very little real and tangible efforts to use innovative approaches to manage the transformation of networks"* (solarZero).
- *"From our whole-of-supply chain perspective we have observed a range of initiatives from distributors to adapt to electrification and uptake of DER"* (DERvolution).
- *"There are many examples of innovation flourishing at small Trust owned networks"* (Lone Wolf).

Q.19 How are distributors currently working together to achieve better outcomes for consumers?

Distributors

8.6 Distributors have formed working groups to share resources and learnings. These groups include:

- The South Island DSO working group: established in July 2021 to investigate and develop a roadmap toward the establishment of DSO services within the South Island.
- The ENA: including the Smart Technology working group which is developing connection standards for distributed energy resources.
- The NEG: group of distributors in the upper North Island that are entirely or majority owned by customer trusts.
- The EEA's – including its most recent masterclass on Grid Connected Solar Projects on 2 August 2021.
- South Island CEO's forum: South Island CEO's meet regularly to discuss the issues facing the distribution sector, share lessons and communicate with stakeholders.
- South Island boiler database project (jointly with Transpower and EECA).
- The South Island Collective Network Operators Group (CNOG): this group meets periodically to consider and share opportunities and developments relating to network standards, competencies and operations.
- South Island Buying Group: collectively negotiate and procure products at competitive prices in the market.
- South Island Overhead Line Designers Forum.
- Upper South Island Load Management (USILM): eight Upper South Island electricity distribution businesses working together to effectively manage the peak loads on Transpower's grid.

8.7 Other collaborated efforts were also mentioned in submissions such as joint EV trials, sharing of data visualisation platforms, collaboration on it and cyber security, contracting out field services to other distributors, and sharing of strategies like the Wellington Electricity EV connect forum.

8.8 Wellington electricity states that leadership is needed to further progress activities and coordinate work programmes.

Other

8.9 Three submissions said that collaboration between the sector was missing currently while a different submission disagrees and states they are seeing evidence of collaboration between distributors that involves the sharing of best practices and avoidance of duplicate investment.

8.10 Transpower suggests that distribution, transmission and wider industry collaboration could enable a more optimal and balanced decarbonisation solution for the process heat users.

- *"Based on Hiringa's experience there is little collaboration between distributors to offer better outcomes for consumers, or any ability to align flexibility services across different distributors"* (Hiringa).
- *"We are seeing very little evidence of distributors working together"* (solarZero).
- *"This distribution, transmission and wider industry collaboration has the potential to achieve better outcomes for consumers as it brings a diverse range of expertise to problem solving which can enable a more optimal and balanced decarbonisation solution for the process heat users"* (Transpower).
- *"We are already seeing evidence of collaboration between distributors that involves the sharing of best practices and avoidance of duplicate investment"* (Vector Technology Services).
- *"Cross-sector (and beyond) collaboration is not a feature of efforts currently"* (DERvolution).

Q.20 Could more coordination between distributors improve the efficiency of distribution?

Distributors

8.11 Distributors generally agreed that more collaboration could be a useful way to improve efficiency through coordination. Six submissions said that the sector is already collaborating and no additional action was needed (PowerNet, Mainpower, Aurora, Westpower, Network Waitaki, and TLC). The important role of the ENA was also mentioned. A joint submission noted that a reasonable response from the Authority is to give clear communication of regulator expectations for industry collaboration.

8.12 Three distributors expressed support for a reporting framework to share trial results (Network Waitaki,, Northpower and Top Energy). However, the reporting framework should not be cumbersome and add an additional layer of cost. The innovation scheme developed by the United Kingdom's electricity sector was put forward as a model that could be copied. The scheme provides innovation expenditure through a contestable innovation fund where distributors bid and share successful ideas,

8.13 Three distributors support consideration of clarifying the roles of the distribution network operator (DNO) and a DSO (Wellington Electricity, Network Waitaki, Orion). However no distributors supported considering a single DSO model. It was noted that this would be costly, would not be an optimal way to improve efficiency, and that it was too early to consider centralised DSO capability.

- *"it would be wrong to assume that a single Distribution System Operator (DSO) would be the optimal way to achieve this (efficiency)."* (Electra)
- *"A single DSO model would involve significant regulatory intervention to separate operators from asset owners. This would be a costly and resource intensive process."* (Joint submission)

Retailers

8.14 Three submissions support more collaboration by distributors and the sector as a whole (ERANZ, Mercury, and Meridian). ERANZ states that, if this is not achieved, regional communities could miss out on innovation and, therefore, the opportunities to reduce their emissions available in other communities.

8.15 Three retailers support clarifying the role of the Distribution System Operator compared to the Distribution Network Operator (Trustpower, Simply Energy, and Mercury). These retailers suggested that different DSO models (like a single DSO) could be explored further. Trustpower puts forward that decisions around DSO models would need to happen early, because once distributors put these functions in place changes will be difficult to make.

- *"Consumers will benefit from more joined-up working across EDBs – regardless of whether that is in the form of amalgamation or more substantive collaboration between distributors."* (ERANZ)
- *"We also believe a review into the merits of a single DSO approach would be a worthwhile undertaking." (*Simply Energy)

Other

8.16 Three submissions support industry wide collaboration and shared learning (solarZero, VTS and SEANZ). Submissions stated that learning was needed across the whole industry and that a workshop to build a coherent and comprehensive plan for accelerating electrification. VTS states that digital platforms were a key enabler of electrification and it would be inefficient for 29 distributors to all build their own. CEN expressed concern that coordination could strengthen distributors monopoly power in flexibility services.

8.17 Enel X noted that the number of distributors was the biggest barrier to greater uptake of flexibility and said a DSO model could address this issue. While Hiringa described the inefficiency they had faced dealing with distributors at different stages on the flexibility market journey.

- *"In Enel X's view, the biggest barrier to greater uptake of flexibility services for networks is the lack of scale. With 29 distributors, over 200 grid nodes, and a different congestion situation for each node, flexibility service providers have limited opportunities to scale and put forward a competitive offer. This is potentially something that a single DSO model could address."* (Enel X)
- *"Hiringa is establishing flexible demand assets across multiple distribution networks, each network is at different stages on the flexibility market journey. This is extremely inefficient, costly and a major barrier to operating flexible assets distributed across the country."* (Hiringa)

Appendix A List of Submitters

#	Submitter	Description of submitter
1	Alpine Energy	Distributor operating in South Canterbury.
2	Anita Dirks	Independent.
3	Aurora Energy	Distributor operating in Dunedin and Central Otago.
4	Bryan Leyland	Consulting Engineer, Hydropower, Power Systems, Electricity Markets.
5	Community Energy Network	18 Members from charitable trusts and community/social enterprises across New Zealand.
6	Counties Energy	Distributor operating in the Counties region in Auckland.
7	Dervolution	Cross industry supply-chain electricity industry participants representatives and consumers.
8	Distributors Joint Submission	Distributors from Buller Electricity, Electra, Mainpower, Network Waitaki and Westpower.
9	Electra	Distributor operating in the Kapiti and Horowhenua districts.
10	Electric Kiwi	Electricity retailer.
11	Electrical Engineers Association	Member organisation providing the electricity supply industry with expertise and advice on technical, engineering and safety issues.
12	Electricity Networks Association (ENA)	Industry membership body that represents the 29 local distributors.
13	Electricity Retailers' Association of New Zealand (ERANZ)	Industry body representing electricity retailers.
14	Enel X	Global business offering smart, simple, and fast technologies and services to help businesses make intelligent decisions about the way energy is created, stored, and managed.
15	Federated Farmers	An advocacy group for farmers and rural communities.
16	Flick Electric Co	Electricity retailer.
17	Genesis Energy	Electricity generation and electricity, natural gas, and LPG retailing company.
18	Hiringa	Experienced energy professionals specialising in hydrogen project development, hydrogen technologies, renewable power generation and fuel cell integration.
19	Independent Electricity Generators Association (IEGA)	Association of members who are associated with small scale power schemes connected local networks for the purpose of commercial electricity production.
20	Intellihub	MEP.
21	Lightforce	Solar energy provider.
22	Lone Wolf	Business providing consultancy services to the New Zealand energy sector.
23	Mainpower	Distributor operating in North Canterbury and Kaikoura region.

24	Marlborough Lines	Distributor operating in the Marlborough Sounds region.
25	Mercury Energy	Electricity generator and retailer.
26	Meridian Energy	Electricity generator and retailer.
27	Network Tasman	Distributor operating in the wider Nelson and Tasman areas.
28	Network Waitaki	Distributor operating in the Waitaki region.
28	Northern Energy Group	Group of distributors consisting of Top Energy, The Lines Company, Vector, Counties Power and North Power.
30	NorthPower and Top Energy	NorthPower - distributor operating in Whangarei and Kaipara districts. Top Energy – distributor operating in the far north region including Kaitaia, Kerikeri and Kaikohe.
31	Nova	Electricity retailer.
32	Orion New Zealand Limited	Distributor operating in Christchurch and central Canterbury.
33	Plains Power	Electricity Retailer.
34	Powerco	Distributor operating in the North Island.
35	PowerNet	Distributor operating in Invercargill City, Southland, West Otago, and parts of Central Otago.
36	Simply Energy	Electricity Retailer.
37	SmartCo	MEP.
38	SolarZero	Solar energy provider.
39	Sustainable Electricity Association New Zealand (SEANZ)	Independent association that represents organisations who want to drive the group of renewable electricity.
40	The Lines Company	Distributor operating in the King Country region.
41	Transpower	Owner and operator of the national grid.
42	Trust Horizon	Distributor operating in the Eastern Bay of Plenty.
43	Trustpower	Electricity generator and retailer.
44	Unison and Centralines	Distributor operating in the Hawke's Bay, Rotorua, and Taupo.
45	Vector	Distributor operating in the Auckland region.
46	Vector Metering	MEP.
47	Vector Technology Services	Technology solution provider under Vector.
48	Waitaki Power Trust	Distributor operating in Waitaki.
49	Wellington Electricity Lines Limited (WEL)	Distributor operating in the Wellington region.
50	WEL Networks	Distributor operating in the northern and central Waikato region.
51	Westpower	Distributor operating in the West Coast.