251 Racecourse Road, PO Box 1642,
Invercargill 9840, New Zealand
P: 03 211 1899
F: 03 211 1880
E: enquiries@powernet.co.nz

Submission of PowerNet Limited
To the Electricity Authority
On the Draft Advice to Government

4 October 2021

1. Introduction

1.1 In July 2021 the Electricity Authority (the Authority) published the Updating the Regulatory Settings for Distribution Networks: Improving competition and supporting a low emissions economy discussion document.

1.2 PowerNet Limited (PowerNet) appreciates the opportunity to make a submission to the discussion document.

1.3 PowerNet is an electricity management company with head offices based in Invercargill. We manage the non-exempt electricity distribution businesses (EDB's) of Electricity Invercargill Limited (EIL) and OtagoNet Joint Venture Limited (OJV), the exempt EDB of The Power Company Limited (TPCL) and the non-grid connected Stewart Island Electric Supply Authority (SIESA). PowerNet is a joint venture company, owned (50/50) by TPCL and EIL.

1.4 PowerNet manage an asset base and investments in excess of NZ$1 billion. It provides services to over 72,000 customers through more than 14,100 circuit kilometres and manage the fourth largest suite of EDB assets in New Zealand. TPCL operates in Southland and West Otago, EIL in Invercargill and Bluff, OJV in Frankton, Cromwell and Wanaka and the rural and coastal Otago region that surrounds Dunedin City and SIESA on Stewart Island.

1.5 This PowerNet submission is on behalf of EIL, TPCL, and OJV and provides feedback with respect to the preliminary views in the paper.

1.6 PowerNet support the Electricity Networks Association (ENA) submission to the Authority. We have reinforced some of the points raised in the ENA submission to highlight areas where PowerNet has particular experience. This is not intended however to lessen the relevance of any of the other points in the ENA submission.

2. Comments

2.1 PowerNet acknowledges the Government's aspiration to reach net zero emissions by 2050 and 100 percent renewable energy generation by 2030. We recognise the important role distribution networks will play in supporting New Zealand's transition to a low emissions economy.

2.2 We anticipate that flexibility services as referenced in the Authority's discussion document, including distributed energy resources (DER), will be a key component in the suite of measures required to achieve the Government's aspiration and meet growing consumer demand.

2.3 Whilst we fundamentally agree with the need for flexibility services; the specific scope, timing and nature of flexibility services best suited to support the necessary evolution of the electricity sector remains uncertain. Issues raised in the discussion document such as the potential to ring-fence DER; or the concept of establishing one or more distribution system operators (DSO) contain so many uncertainties that require more detailed discussion and consideration.

2.4 Sapere's analysis of flexibility services shows that material benefits will not accrue until after 2035. Even if the speed of uptake exceeds the anticipated timeframes, there remains time to consider and test options before committing to a particular approach, including definition of standards.

2.5 We also recognise that the pace of change needs to be responsive to the community of need. Different regions will need different solutions at different times. EDBs won't need to be at the same stage in their technological evolution at the same time. This is likely to become evident within the networks that PowerNet manages.

2.6 For example, the variable geography, ICP density, and consumer mix means the preferred community solutions will differ for the EIL central Invercargill business community compared with TPCL rural farming community.

Evidence Based Development of Standards

2.7 Setting standards in advance of a rigorous process of testing and proving the most viable and cost-efficient market solutions has the potential to lock EDBs into restrictive requirements that may quickly become out of date and may create unanticipated barriers to consumer adaptation or adoption. Accordingly, we believe an evidence based approach that delivers proven benefits is an essential pre-requisite to the development of standards for flexibility services rollout.

2.8 This evidence base must be done in partnership with EDB's. Many EDB's are already researching and testing possible network solutions.

2.9 PowerNet is actively involved in hot water load control across the networks it manages. Hot water load control enables flexibility that is generally used to minimise peak loads and costs at transmission level (although the major incentive is likely to be removed in April 2023 with the changes to the Transpower Regional Coincident Peak Demand charges) and to alleviate distribution network constraints. This improves utilisation of existing network assets, defers investments and reduces costs for customers on off-peak tariffs.

2.10 The number of DER connections is expected to continue to increase over the next 5-10 years and could lead to power supply-demand imbalances at the distribution level. This will need to be managed through economic investments and operations, including utilisation of flexibility services that control DER. PowerNet is investigating the potential value of flexibility services for supporting safe, efficient, and reliable supply of electricity to our customers.

Real-Time Information

2.11 Provision of real-time network information is integral to growing an informed community capable of offering and implementing solutions. Timely access to smart meter data for both EDB's and flexibility providers is currently a significant barrier to achieving an informed community, and as a result impacts on flexibility services and DER uptake.

2.12 The EIL and TPCL networks (managed by PowerNet) own most of the smart meters in their network area and have contractual arrangements through SmartCo (MEP) to access the smart meter data for network management purposes. However there are a number of third party owners of smart meters in the EIL and TPCL network area and access to required data from their smart meters is not straightforward.

2.13 An important aspect of access to smart meter data is that it enables greater visibility of low-voltage (LV) asset loading and performance, including the management of LV power quality. Without access to 100% of smart meter data it is not possible to determine power flows on every part of the network without estimation. The issue of lack of visibility of LV networks is currently an issue for OJV (managed by PowerNet) where all smart meters are owned by third parties and required data is not accessible. PowerNet is forced to consider duplicating these assets which is clearly an undesirable use of resources and may impact the cost to service customers.

2.14 PowerNet was integral in the establishment of SmartCo, on behalf of its shareholders. PowerNet's shareholders, TPCL and EIL are SmartCo shareholders, with TPCL and EIL networks the smart meter asset owners, with the MEP function contracted to SmartCo.

2.15 The SmartCo relationship has enabled the development of electronic tools for LV monitoring across TPCL and EIL networks, providing valuable information for PowerNet as network manager, which will enable DER monitoring and management for network and customer purposes.

2.16 Privacy permission issues place limits on the use of the data. In addition, where the EDB does not own the smart meters, energy retailers restrict EDB's to use the smart meter data for network purposes only. Retailers do not want the use of smart meter data for any type of activity that might directly or indirectly compete with their business. This restriction stops EDB's (or any party) making the data available to independent DER flexibility providers.

2.17 On behalf of the EDB's PowerNet represent, PowerNet has sought to establish relationships with retailers regarding access to meter data. Whilst this has been mostly positive, it is inconsistent and can be incomplete. It relies on requests for specific data for specific periods, as opposed to general continuous access, on commercial terms, for network management purposes.

2.18 A mutually agreeable standardised process for sourcing and sharing real-time network data across the entire distribution network; such as a centralised API, without retailers as 'gate-keepers', but with appropriate access controls to deliver improved access to information is considered a key output from this consultation.

2.19 PowerNet has a dedicated New Energy team focused on developing capability in alternative solutions. The team includes a dedicated DER Engineer who is progressing projects on smart meter data analysis, LV network monitoring, forecasting DER uptake, impact on network power flows and mechanisms for DER control. The establishment of this team by PowerNet demonstrate that EDB's can and do develop the capacity and capability to manage the challenges the future holds.

2.20 Additional resourcing opportunities that are not impacted by regulatory income restrictions may be required to accelerate development of systems and leveraging of opportunities available through DER control and flexibility.

Part 6 Review

2.21 Since the inception of Part 6 of the Electricity Industry Participation Code (Code), the number of Distributed Generation (DG) connection applications has progressively grown, and the number of applications is expected to continue to escalate at an ever increasing rate. As a result, we consider Part 6 is in need of a substantive review.

2.22 The scope of DER that should be included in DG covered by Part 6 needs consideration to ensure processes, timings, fees and DG pricing principles contained in the Code are sufficient and appropriate.

2.23 PowerNet considers there is a strong need for separate processes to be established relating to large DG applications that involve more complex review; medium applications, and small comparatively simple DG applications.

2.24 The ENA provide a good summary of key issues experienced by EDB's in relation to the connection of DER under Part 6 (refer ENA submission Appendix A - Q6).

2.25 PowerNet recognises that any proposed change to Part 6 that has the potential to make DG connection harder will be difficult to adopt. Nonetheless it is critical that the realities of DG connection processes, timing, and costs are properly recognised, understood and accepted.

Cost Implications

2.26 The ability for EDB's to incur the additional expenditure associated with development and implementation of new flexibility service solutions; and the associated transfer of these costs to consumers is limited by the regulatory regime. Non-exempt EDB's expenditures and service levels are tightly regulated by the Commerce Commission. Exempt EDB's also face regulatory oversight from the Commerce Commission via the information disclosure regime.

2.27 The inconsistency of one regulator questioning the capacity of EDB's in the DER space, while the other imposes financial disincentives for increased operating expenditure is an example of an area of concern.

2.28 The PowerNet network management approach provides distinctive local management of EDB's that allows EDB's to retain independence where and when required. The PowerNet model creates demonstrable efficiency benefits, and minimises costs for consumers. PowerNet considers that this model offers a practical alternative to consolidation of EDB's, providing genuine benefits to consumers that preserve local ownership.

2.29 Accordingly PowerNet advocates on behalf of the EDB's it represents for engagement between EDB's and the relevant regulatory agencies (i.e. the Authority and the Commerce Commission) to jointly identify practical and meaningful incentives and regulatory parameters to enable EDB's to research, test and develop viable network solutions.

3. General Observation

3.1 Additional detail relating to specific questions outlined in the discussion paper are provided in Appendix A below.

3.2 PowerNet acknowledges that the scope of the consultation paper includes consideration of issues both within and outside the Authority's powers. Nonetheless we recognise that transitioning New Zealand to a low emissions economy will require a multi-faceted approach involving all stakeholders across the sector.

3.3 PowerNet welcomes the opportunity to engage more directly with the Authority; and with other key stakeholders, to provide a better understanding of our businesses and to work in partnership to achieve mutually beneficial outcomes.

3.4 We thank the Authority for the work to date and appreciate the opportunity to make a submission. We look forward to receiving further detail and clarity.

PowerNet Contact

PowerNet's contact for this submission is: **Dion Williams**
Regulatory Manager
dwilliams@powernet.co.nz or (03) 211 1899

Appendix A:
Response to discussion document consultation questions

Consultation Question
Q.1 Have you experienced issues relating to a lack of information or uneven access to information?
Refer paragraphs 2.12 – 2.17 of the PowerNet response above. A good example of issues experienced with uneven access to information across the networks PowerNet manages is the variance in smart meter coverage and information access between the EIL and TPCL networks; which have high penetration providing PowerNet with access to valuable information, compared with the lack of coverage or access on the OJV network. The level of estimation required is far greater for OJV and uncertainty in network operating parameters increases closer to the customer, especially on the LV network. Remote and efficient detection of broken neutrals, reverse power events from undisclosed DG connections, overcurrent event or over and under-voltage events is not currently available for OJV as it is for TPCL and EIL due to lack of data access.
Q.2 What information do you need to make more informed investment and operation decisions?
PowerNet agrees with ENA that the smart meter data vital to ensuring that EDB's can enable flexibility services to achieve their full potential are: • kWh • kVa • Voltage (max, min, average) • Power Factor • Energisation status • Last gasp In addition, we believe harmonic levels data is also important. This data is necessary to enable monitoring of network utilisation and will in turn enable hosting capacity to be accurately determined so that it may be shared for the implementation of a flexibility services market. Utilising flexibility services is largely a process of drawing more energy at times of surplus distribution capacity such that peak periods see less demand. The transition to a distribution system incorporating new technologies, especially DER and forms of storage mean energy usage (kWh) and the timing of varying usage becomes critical to understand as well as the peak demand (kW) that has traditionally been estimated. The minimum resolution for these readings is 30 minutes, however overseas EDB's are moving to 1 minute resolution which results in increased potential. In addition to smart meter data, visibility of the type and scale of installed capacity behind the meter is important. This needs to be available in a consistent format for all EDB's. Data on DER availability and how reliably and consistently it can be counted on to operate, as well as procurement cost for requesting DER/flexibility services support, will be necessary for a functioning flexibility services market and for a cost efficient network relying on these services to be built. Currently PowerNet has no visibility of the registered location of EVs in the networks they manage, capacity of EV chargers at the locations, and when they charge. The option of a DER registry, as outlined in the discussion document, could assist here. In addition the potential to make EV charger standards mandatory is worth consideration.

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

Mandated collection of, and access to smart meter data is an absolute necessity.

The Registry central data repository could be expanded to include information about other types of DER, including batteries and EV charging infrastructure installed at each ICP.

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

PowerNet has not experienced any widespread or systemic issues arising from the operation or connection of DER. However, the *connection* of DER is anticipated to pose increasing challenges, meaning it would be sensible to review elements of Part 6 of the Code to ensure appropriate coverage of all relevant DER, and that these are fit for purpose.

As capabilities develop over time (dependant on sufficient data access) EDB's will learn what new standards may be necessary for DER to enable an optimally efficient flexibility services market in future. Meantime, we will continue to build network and connect installations, under rules and knowledge available at the time, which may be unable to retrospectively meet new standards once implemented. Therefore, while issues are not currently experienced we may currently be accumulating issues that present at a later date once there is greater technology penetration.

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?

Yes, the Electrical (Safety) Regulations (ESR) require review. The Ministry of Business, Innovation and Employment (MBIE) is undertaking a review of the Regulations. PowerNet defer to the views of the EEA in relation to this review.

PowerNet currently uses the EEA good practice guideline for connection of distributed generation. However we note that this is not publically available to non-members.

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?

A review of Part 6 is welcomed.

Part 6 only requires the use of an AS/NZS 4777.2 compliant inverter as an optional criterion to access faster Part 1A application. PowerNet believes that Part 6 should be updated to make this a compulsory criterion. Part 6 should be regularly updated to reflect a rapidly changing industry and standard-set.

DER connections are becoming more frequent and the time-frames are getting more difficult to reach. Fairly allocating capacity to potential connectees is difficult. The fees that are able to be charged by EDB's are incremental costs only, resulting in EDB's subsidising the "early adopters".

PowerNet supports a specific application for large scale DG to ensure that the EDB's charge the applicant reasonable fees for processing their application, including any professional services the EDB needs to employ to make an informed decision.

Q.7 Is there a case to be made for minimum mandatory equipment standards for DER equipment, specifically inverter connected DER?
Yes, standards are important. However, consideration must be given to ensuring that regulation can keep pace with changing technologies.
Q.8 What standards should be considered to help address reliability and connectivity issues?
The Code provision relating to inverter standards should be amended to incorporate the power quality response modes set out in the relevant standard (AS/NZS 4777).
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?
The mandating of standards would provide little in the way of additional standardisation and may introduce risk by disrupting existing effective processes.
Q.10 What flexibility services are you pursuing?
A requirement to explore flexibility solutions prior to implementing network solutions may be worth consideration – however 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. As described in paragraph 2.19 above, the PowerNet New Energy team is focused on developing capability in alternative solutions. An example of this is the investigation of load control options for EV chargers for the PowerNet managed networks. South Island EDB CEs have begun initial discussion on the concept of a potential South Island DSO. This is at the very early stages of discussion, initially focusing on the types of potential DSO functions that may be of value. PowerNet believes time should be taken to ensure a consensus view of a DSO model is explored and agreed prior to investigation of the scope of a DSO model. Only if and when this is achieved would there be consideration of how a DSO model could be implemented across the country.
Q.11 Are flexibility services being pursued through a competitive process?
Opportunities for collaboration are currently limited by the commercial reality of competitive advantage. As described in question 10 above, the investigation currently underway by the South Island EDB's will be an enabler.

Q.12 What options should be considered to incentivise non-network solutions?
Current options are being advanced, including the publishing of areas of constraints in network regions, providing non-network providers opportunity to consider whether they wish to offer solutions. Regarding incentives, whether that be for non-network or network providers, EDB's are finding the extremely limited innovation allowance currently provided by the Commerce Commission needs expanded. This limited funding is hard to access and has stringent conditions attached. A combination of these factors has resulted in extremely limited uptake rather than a lack of need for appropriate trial funding. International experience in the significantly larger UK and Australia networks has demonstrated the value in properly funded and coordinated trials. The establishment of a larger innovation funding pool with wider scope and easier access would be favoured to incentivise non-network solutions.
Q.13 What options would encourage competitive procurement processes for flexibility services?
PowerNet does not consider there is a need for regulatory intervention to encourage flexibility service procurement. What is required is better support and funding for the sector to identify and develop cost-effective solutions. Identifying the most economic solutions requires the opportunity for EDB's and any other providers to actively participate and invest in development of cost effective flexibility service solutions. Accordingly, PowerNet believes the option to ring-fence or restrict EDB investments in DER is likely to have far reaching negative implications.
Q.14 Have you experienced difficulties with negotiating operating agreements for flexibility services?
Due to low volume and relatively small scale flexibility service uptake to date, PowerNet has not experienced difficulties with negotiating operating agreements for flexibility services.
Q.15 Are the transaction costs of developing contracts a barrier to entering the market for flexibility services?
The cost of contract development is not a material barrier to flexibility services.
Q.16 Would an operating agreement help lower transaction costs and level negotiating positions?
Designing a standard operating agreement is not seen as a preferred approach due to the lack of clear direction and evidence to support identification of the most practical solutions likely to result in best outcomes.

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

As referenced in the response to Q16, a standardised agreement is not considered ideal. Non-standard agreements that allow for multiple party relationships with consumers will provide the best opportunities to cater for the wide range of services and technologies that fall under the flexibility services umbrella.

Q.18 What are distributors doing to ensure their network can efficiently and effectively manage the transformation of networks?

PowerNet considers the transformation of networks to be a 'chicken and egg' challenge – EDB's do not see sufficient flexibility available to rely on, and see it as a not-quite ready yet solution; and flexibility suppliers don't have sufficient certainty their capability will be used to underpin the required investment, and so cannot demonstrate flexibility can be relied on.

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

EDB's work together via the ENA, EEA and direct sharing of experience with peer EDB's. Recent PowerNet examples include:

- the South Island EDB's Decarbonisation Roadmap for Process Heat. This is a stocktake and detailed customer engagement of all process heat across the South Island that has the potential to move to electrification. This initiative is being supported by EECA and Transpower. The findings are assisting PowerNet to work with its connected customers for their particular plans, with it also supporting recent GIDI fund applications. The information is also integral to network asset planning;
- the South Island EDB's DSO Investigation, to assist EDB's understand the future options for DSO management (currently underway);
- the establishment and operation of SmartCo, the smart meter management company that has deployed smart meters across the shareholder EDB networks and is now developing and delivering data tools and information to the shareholder EDB's to enable LV visibility and other valuable information. SmartCo is owned by WEL Networks, Network Tasman, Alpine Energy and the two PowerNet shareholders, TPCL and EIL. SmartCo also provides services on the Mainpower and Top Energy networks;
- the South Island EDB's jointly marketing their insurance programmes to the insurance industry to deliver direct financial benefits to customers. This initiative involved Alpine Energy, Mainpower, Marlborough Lines, Nelson Electricity, Network Tasman, Buller Electricity and the PowerNet insurance group (EIL, TPCL, & OJV). The sum insured is $815M and has delivered a 20% plus premium saving which will directly benefit customers through the DPQP regime.

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

PowerNet agrees that enhanced coordination between EDB's can improve the efficiency of distribution. We will continue to seek out collaboration opportunities. Examples over recent years clearly demonstrates that collaboration between EDB's delivers better outcomes and benefits for consumers. PowerNet is confident collaboration will continue and increase, given the experience to date.