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Accelerating renewable energy and energy efficiency

Submission to the Ministry of Business, Innovation and Employment

From the Electricity Networks Association

1. Introduction

The Electricity Networks Association (ENA) appreciates the opportunity to make a submission to the Ministry of Business, Innovation and Employment discussion document on "Accelerating renewable energy and energy efficiency".

The ENA represents the 27 electricity distribution businesses (EDBs) in New Zealand (see Appendix B) who are providers of local and regional electricity networks that will be critical in delivering renewable electricity to communities.

ENA is pleased that the distribution sector's future-focused *Network Transformation Roadmap* (NTR) project has been referenced extensively in the discussion document. ENA is committed to working with its members to achieve the outcomes envisaged in the NTR – a safe, reliable and economic transition to enable electricity lines companies to support the wider aspirations of their communities to decarbonize New Zealand.

ENA and its members support higher levels of renewables and improvements in energy efficiency, as we recognise that collective action is required to limit the impact of climate change. We support interventions, such as the 'electrification information package' proposed in section one of the discussion document, that improve the quality and accessibility of information, using "sunlight" to illuminate or put pressure on businesses to consider more carefully options to improve energy use and efficiency. We are also in favour of steps to identify and remove undue market or regulatory barriers to the uptake of improved energy solutions. More generally, we believe that an effective Emissions Trading Scheme, supported by expert independent advice from the Climate Change Commission, should do the heavy-lifting on encouraging renewables and improvements in energy efficiency, with a price on carbon used to reveal and incentivise the least cost abatements available to New Zealand.

Our response to the specific questions raised in the discussion document that we considered relevant to the distribution sector are contained in Appendix A of this submission. If you would like to discuss any of the points raised in further detail, please contact Richard Le Gros (details below).

For more information contact Richard Le Gros, richard@electricity.org.nz

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3. Appendix A

Please note: Where we have not provided a response to a question posed in the discussion document, please consider this a "no comment" response.

Part A - Encouraging energy efficiency and the uptake of renewable fuels in industry

Section 1: Addressing Information Failures

Q1.7 Do you support the proposal to develop an electrification information package? Do you support customised low-emission heating feasibility studies? Would this be of use to your business?

A1.7 For large energy users considering the switch to renewable electricity, early engagement with the relevant network owner, be that the local EDB or Transpower, is critical. We would therefore support an electrification information package for large energy users that contained practical advice about the process of obtaining a new network connection or increasing the capacity of an existing one.

Section 5: Boosting investment in energy efficiency and renewable energy technologies

Q5.1 Do you agree that complementary measures to the NZ-ETS should be considered to accelerate the uptake of cost-effective clean energy projects?

A5.1 As the government considers what additional measures could be deployed, over and above the NZ-ETS, we encourage it to also take into account the role that existing regulations play. In particular the Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004 currently sends a strong economic signal to qualifying residential consumers that over-incentivises the deployment of DG which, when installed, does not (in most cases) provide a corresponding reduction in network usage. Conversely, the regulations impose additional costs on those who fall into the high user category of consumer, which will increasingly include electric vehicle owners, who then subsidise those in the low user category. This acts as a disincentive to the uptake of electric vehicles and an unfair and inefficient cross-subsidy.

At the same time, the Electricity Authority has for many years been strongly encouraging the distribution sector to reform its pricing structures (tariffs) to make them more cost-reflective (i.e. that they accurately reflect the true costs that any individual consumers drives in the provision of the distribution network).

It is impossible for industry participants (electricity distribution businesses in this case) to effectively reconcile these two competing and contradictory public policy instruments. We therefore strongly encourage the government, in considering additional measures to the NZ-ETS, to examine existing regulation and regulatory direction to ensure that this is consistent and supportive of its intended aims.

Q5.2 If so, do you favour regulation, financial incentives or both? Why?

A5.2 Please note our answer to Q5.1 above.

Part B: Accelerating renewable electricity generation and infrastructure

Section 7: Enabling development of renewable energy under the Resource Management Act 1991

Q7.20 Are the current NPSET and NESETA fit-for-purpose to enable accelerated development of renewable energy? Why?

A7.20 ENA has highlighted on multiple occasions the inconsistency of excluding EDB-owned transmission assets, which in many cases were divested from Transpower, from the NPSET. We recommend that the government consider how the NPSET or an equivalent policy instrument could be amended/drafted to recognise and protect strategically significant electricity distribution assets. This will in turn support the development of renewable energy projects that will rely upon a connection via the distribution network. ENA would be happy to assist the relevant government department with the drafting such a policy.

Section 8: Supporting renewable electricity generation investment

Q8.7 Do you consider the development of the demand response (DR) market to be a priority for the energy sector?

A8.7 The development of a demand response market – particularly at the distribution network level – is an important element in effectively and efficiently supporting greater levels of DER and DR on local networks. The ENA's *Network Transformation Roadmap* describes the longer-term importance of DER/DR and some of the steps required to unlock it in the 'Open Network Framework' section of the roadmap.

Currently, at the distribution network level in NZ, the development of viable demand response markets is at an early stage. There is little visibility to DER/DR owners or third parties that might manage their engagement in a DR market (e.g. demand aggregators), of the value DR might have to others (incl. EDBs), and therefore little incentive to make it available. From an EDB perspective, limited access to smart metering data makes it difficult to assess the potential of sources of DR that might exist on their network, or the constraints that DR might help to alleviate. In addition, the Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004 may cause an excessive investment in DR capability because the resultant high variable prices for low users encourage disproportionate investments in DER, which then necessitates costly DR solutions to mitigate the impacts of over-voltage etc.

As things stand today, the local electricity networks in NZ are largely unconstrained. We therefore recommend that the electricity market participants (incl. EDBs) be given time and freedom to develop

and experiment with different technical and commercial arrangements for demand response, before the government intervenes.

We note that overseas jurisdictions have much greater pressure to invest in development of DR and flexibility markets to manage the security and reliability issues caused by high proportions of intermittent renewables. We think that there is therefore high value in watching the progress of DR markets elsewhere and emulating the most effective approaches.

Q8.8 Do you think that DR could help to manage existing or potential electricity sector issues?

A8.8 As per our response to Q8.7 above, we believe that a well-developed and fully functioning market for demand response services on electricity distribution networks will be important in managing many of the impacts we foresee arising from the electrification of NZ – in particular mass-uptake of electric vehicles and solar panels combined with domestic-scale batteries.

However, even with higher rates of uptake than presently observe, we believe that a progressive development of DR markets that can build on emerging best practices in overseas markets that are already observing challenges (e.g., Australia, UK) is the best approach, rather than seeking to be at the leading edge of DR market development. The most important aspect is that as consumers take up new technologies, this uptake is future proofed through application of consistent connection standards (e.g., for inverters), and common communication protocols (to enable third-party coordination and management).

We agree that over the longer term affordable, flexible and wide-spread provision of DR resources on distribution networks, accessible and controllable by EDBs and other market participants (with appropriate compensation for DR resource owners), will enable the greatest possible utilisation of the existing distribution network, therefore deferring or perhaps avoiding costly upgrades. In addition, localised and transient peaks in demand and instances of poor power quality will be more easily managed, providing a better and more reliable service to all electricity consumers.

A demand response market will also be a useful to EDBs as a risk management tool as transitions to a low carbon future. It will allow EDBs to accommodate greater volumes of new technologies (e.g. solar PV, electric vehicles) on the distribution networks without comprising the high levels of power quality and reliability consumers currently enjoy.

Q8.9 What are they key features of demand response markets? For instance, which features would enable load reduction or asset use optimisation across the energy system, or the uptake of distributed energy resources?

A8.9 From an EDB perspective, the key features of a useful demand response market will be:

- Penetration – The demand response capability must be available in those parts of the network that are under stress. This may be a relatively small proportion of the overall network and therefore have a limited number of connected consumers. Among that limited pool of consumers, there must be sufficient demand response resource available to deliver a viable

and useful response to relieve the network constraint. Therefore, there must be a reasonably high level of DER penetration across the entire network to ensure that is likely to be the case for any smaller sub-section. Note that this is not to suggest that DER deployment should be incentivised or encouraged everywhere, simply so that it is available should a network constraint arise.

- Availability – it is probable that EDB use of demand response to relieve constraints on the distribution networks will only be for specific and potentially comparatively short periods of time – at least in the early days. It is important that there is sufficient demand response resource available to the EDB to call upon at the time it is needed. If the DR resource has recently been called upon by other market participants, or is being actively utilised by other participants, it may not be able to provide the response required by the EDB. This may also be the case for other users of demand response. Managing this appropriately without overly constraining the use and potential users of demand response will be essential to maximising value.
- Affordability – It is perhaps obvious but the cost of utilising a DR market to resolve a network constraint must be less than the traditional approaches EDBs would take to resolve such constraints, such as building more capacity.

Q8.10 What types of demand response services should be enabled as a priority? Which services make sense for New Zealand?

A8.10 As noted in our response to Q8.7 above, ENA supports the focus on developing the demand response market in New Zealand as a key opportunity to support electricity asset optimisation, customer-centric services and efficiency, as well as supporting the transition to a low emissions energy future. Demand response markets can help to shape energy systems around the customer, which, along with community renewable energy, can help to strengthen the social license of renewable energy and our wider transition to a low emissions energy future.

The discussion document mentions virtual power plants (VPPs) - an internet based 'distributed power plant' that aggregates the capacities of users' DER, to trade or sell power on the electricity market. ENA supports the integration of smart digital platforms to strengthen coordination across our energy systems. The use of smart digital platforms creates a foundation to support the innovation and trials to determine whether a localised or centralised model offers the most efficient solution at the whole system level for the implementation of VPP and other distributed energy resources.

ENA does not support the suggestion in the discussion document to scale up Transpower's demand response pilot programme to provide a national market mechanism. With the majority of participants in this scheme[1] being large commercial and industrial customers, typically running backup generators to participate in Transpower's programme, there is a limit to the number of new participants, and the mechanism by which they are participating is not well aligned with the goal of reducing emissions.

We note that demand side management can have a different value depending on the market participant, and we believe that it is critical that demand response markets are developed around the needs of all customers, not just large energy users.

[1] https://www.transpower.co.nz/keeping-you-connected/demand-response/our-demand-response-programme-0

Demand response technology is part of the portfolio of services including DERs that will create decentralised energy communities integrating customer sited technologies on the low voltage network.

We believe that imposing a centralised Distribution System Operator (DSO) to work with Transpower and other DR market participants, as is contemplated in the discussion document, is inconsistent with a decentralised energy system which enables efficient community renewable generation, and greater resilience.

Research in the UK[2], has found that local flexibility resources, like DERs and DR, create the most value when they are used at the low voltage level, because there are often many alternative options to manage system constraints at the national level, whereas DERs at the edges of local networks are one of the only economic options to defer infrastructure upgrades. In evaluating a centralised system operator, the researchers found that several options can appear efficient at a national scale, but, due to the lack of coincidence between local and national peaks, some of those options will lead to inefficient solutions at a local scale. Due to those inefficiencies, the research found that planning a framework around local DSOs rather than a centralised DSO resulted in nearly double the cumulative cost savings for customers.

Q8.11 Would energy efficiency obligations effectively deliver increased investment in energy efficient technologies across the economy? Is there an alternative policy option that could deliver on this aim more effectively?

Q8.12 If progressed, what types of energy efficiency measures and technologies should be considered in order to meet retailer/distributor obligations? Should these be targeted at certain consumer groups?

Q8.13 Do you support the proposal to require electricity retailers and/or distributors to meet energy efficiency targets? Which entities would most effectively achieve energy savings?

Q8.14 Could you or your organisation provide guidance on the likely compliance costs of this policy?

A8.11, 8.12, 8.13, 8.14 Energy efficiency supports better outcomes across the energy market. All consumers benefit from energy efficiency gains that lead to deferred or avoided infrastructure upgrades on the distribution network, not just those who can afford to install new technology. This because infrastructure upgrades needed to ensure adequate capacity at times of maximum demand are a key driver of costs for network businesses (accounting for up to half of EDB costs in some cases). Energy efficiency also reduces the need to invest in new generation assets, by using less energy to deliver the same service to the consumer.

However, as noted by the discussion document energy efficiency investment sometimes does not occur even when it makes sense from a system efficiency point of view due to a lack of access to capital. This is especially true for EDBs as their capital expenditure allowance is determined by price quality regulation.

[2] https://es.catapult.org.uk/news/assessing-the-potential-value-from-dsos/

We believe there is an opportunity to catalyse greater EDB investment in energy efficiency by aligning regulatory settings to encourage EDBs to invest in long term energy efficiency and to integrate new energy solutions which contribute to greater overall system efficiency. We also favour incentive-based interventions, to encourage this further.

Encouraging energy efficiency requires the right incentives to overcome the immediate short-term risk associated with the integration of new energy solutions. See The Brattle Group report[3], written for ENA, for several examples of incentive structures that help align regulatory and policy goals.

To further support the roll-out of new energy technologies and services, EDBs will need to be able to undertake trials to understand their performance. When engineers specify a traditional wires solution on the network, they know what it will cost and how it will perform. In order to accelerate deployment of technologies like energy efficiency on the network and guarantee the same level of grid reliability as a traditional solution, EDBs will need to utilise real-world performance data from trials to compare the costs and benefits of new technologies and services against traditional network upgrades to ensure that they deliver the most affordable solution for consumers.

Section 9: Facilitating local and community engagement in renewable energy and energy efficiency

Q9.1 Should New Zealand be encouraging greater development of community energy projects?

A9.1 Yes, in as much as those community energy projects deliver real, but not necessarily purely commercial, benefits to the communities they serve. Where unnecessary barriers exist to community energy projects or any other type of energy project these should be broken down.

We also note the value to resilience of strengthening community engagement with renewable energy and energy efficiency. By reducing communities' reliance on the centralised networks we consider that facilitating community engagement with renewable energy has a role to play supporting climate change adaptation, and mitigation.

Q9.2 What types of community energy project are most relevant in the New Zealand context?

A9.2 There is no one type of community energy project that is most relevant in NZ – the projects that communities elect to develop and support will be driven entirely by their unique circumstances and aspirations. We do not see any obvious reason why a particularly relevant 'type' of community energy project needs be identified.

[3] https://comcom.govt.nz/__data/assets/pdf_file/0020/106076/Brattle-Group-on-behalf-of-ENA-Incentive-mechanisms-in-regulation-of-electricity-distribution-innovation-and-evolving-business-models-October-2018.PDF

Q9.3 What are the key benefits and downsides/risks of a focus on community energy?

A9.3 From an EDB and electricity industry perspective, a key downside or risk to a community energy project would be that such a project consumes resources, such as money, time, goodwill, etc, from the community that outweigh the benefit. It is therefore important that community energy projects with real merit can be identified and pursued, but equally that those without sufficient merit are not afforded time and resources out of proportion with their potential benefits.

Q9.4 Have we accurately identified the barriers to community energy proposals? Are there other barriers to community energy not stated here?

A9.4 The default price path regime operated by the Commerce Commission under Part 4 of the Commerce Act 1986 constraints the amount of resources EDBs can devote toward non-core activities, which would likely include support for community energy proposals.

We also note that local, community owned EDBs are well placed to support community engagement with renewable energy and energy efficiency, having a line of sight across network requirements and the needs of local communities.

Q9.5 Which barriers do you consider most significant?

A9.5 It is our experience that financial barriers (e.g. access to capital) are the most significant hurdles to successfully realising community energy projects. Many projects are predicated on using a pre-determined site, and where other factors (e.g. costs of network connection and associated reinforcement) make this site no longer viable, there is no ability to host the project elsewhere. Regulatory constraints are the second most significant barrier for community energy projects that we see. In particular the Electricity Industry Participation Code can be challenging to understand and navigate to those new to the sector, and does not always allow for innovative or novel energy generation or trading arrangements.

Q9.7 What do you see as the pros and cons of a clear government position on community energy, and government support for pilot community energy projects?

A9.7 In terms of a government position on community energy, the government needs to be very clear about identifying what aspects of community energy projects it sees as valuable and beneficial, as opposed to the more traditional grid-delivered electricity from centralised renewable generation (e.g. hydropower, wind farms, etc). Once these elements are identified and clearly articulated, it will be easier for industry to support community energy projects that have positive outcomes.

As with all government funding mechanisms, there is a risk of picking winners and over-incentivising otherwise unsuitable or unviable projects. Not only does this put the funding provided by government at risk, it also diverts local community and industry efforts towards projects that would not otherwise be pursued, at the expense of more useful projects. Government will therefore need to ensure that

there is very clear criteria about the types of community energy projects it wishes to support, so that funding is directed towards the projects most likely to deliver the outcomes the government is seeking. The government should also consider how its role intersects with local government, which may be better placed to identify the needs of local communities and community energy projects.

Section 11: Local network connections and trading arrangements

Q11.1 Have you experienced, or are you aware of, significant barriers to connecting? Are there any that will not be addressed by current work programmes outlined above?

A11.1 The processes for designing and building new connections to the distribution networks is a core business activity of EDBs, and has been since distribution networks were first constructed. As such, the processes that are in place for consumers to obtain a new connection to the distribution network have been refined and proven over many decades. We are not aware of any significant deficiencies or problems associated with the application, design, or construction processes of obtaining a network connection.

It should also be noted that more significant connections (longer circuit lengths, greater capacity/higher voltage, land acquisitions/easements required) naturally take longer to plan, design and deploy, and are more costly. This is not a barrier imposed by the EDB, it is simply the nature of designing and constructing larger and more complex network assets. Those needing these more significant network connections should always engage with their local EDB as early as possible once they know it will be required. This advice should be a feature of the electrification information package described in section one of the discussion document.

Q11.2 Should the section 10 option to produce a users' guide extend to the process for getting an upgraded or new distribution line? Are there other section 10 information options that could be extended to include information about local networks and distributed generation?

A11.2 As noted in our response to question Q11.1 above, we are not aware of any significant barriers to obtaining a connection to the distribution networks. However, if further information on this process would be beneficial to potential consumers then we would support the creation of a users' guide.

Q11.3 Do the work programmes outlined above cover all issues to ensure the settings for connecting to and trading on the local network are fit for purpose into the future? Are there things that should be prioritised, or sped up?

A11.3 We do not believe that there are currently any structural barriers to obtaining a new distribution network connection, or to connecting devices (in particular DG and DER) to the distribution networks. Indeed, many such connections have already taken place and more are being added to the networks every day. As the discussion document notes, the ENA's *Network Transformation Roadmap* project has an active workstream looking at ways in which the connection arrangements for DG and DER

could be improved, but these are focussed at improving some of the administrative aspects of the connections process, rather than a profound change to the types of devices that can be connected – which we again reiterate is largely unconstrainted at the moment.

Q11.4 What changes, if any, to the current arrangements would ensure distribution networks are fit for purpose into the future?

A11.4 There are two key tools that EDBs will require to help them manage network impacts in the future that they do not currently have sufficient control over. These are:

- Distribution pricing: As the ENA's *Network Transformation Roadmap* notes, distribution pricing is a key mechanism by which EDBs can signal to consumers the cost of the distribution service and the value to the EDB DR and other network support services. EDBs are well on their way to reforming distribution tariffs but they are still heavily constrained in doing so by the Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004. To provide EDBs with flexibility to develop distribution tariffs that ensure the safe and effective operation of distribution networks, these regulations must be repealed or substantially reformed.
- Smart metering data: EDBs require good visibility of their low voltage networks to ensure that they can manage the impacts and maximise the opportunities provided by new technologies (e.g. DR, DER, etc). This will provide benefit to both the EDB and to third parties who can provide services to EDBs to relieve network constraints. There are two obvious mechanism for EDBs to gain this visibility of the low voltage networks, being the installation of LV monitoring technologies on the network itself, and/or accessing data gathered by smart meters. As smart meters are already largely deployed across NZ distribution networks, it will be most cost-effective and efficient for EDBs to obtain access to the relevant data already being gathered by these devices to help them better understand the state of their low voltage networks. Unfortunately, despite much effort expended by many parts of the industry (EDBs, retailers, MEPs) there is still not a cost-effective route for EDBs to gain access to the necessary smart meter data for this purpose. It may therefore be the case that a regulatory intervention is required to resolve this issue for the long-term and develop an enduring regime for EDB smart meter data access.

4. Appendix B

The Electricity Networks Association makes this submission along with the support of its members, listed below.

Alpine Energy
Aurora Energy
Buller Electricity
Counties Power
Eastland Network
Electra
EA Networks
Horizon Energy Distribution
Mainpower NZ
Marlborough Lines
Nelson Electricity
Network Tasman
Network Waitaki
Northpower
Orion New Zealand
Powerco
PowerNet
Scanpower
The Lines Company
Top Energy
Unison Networks
Vector
Waipa Networks
WEL Networks
Wellington Electricity Lines
Westpower