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Andy Burgess,

Head of Energy, Airports, and Dairy Regulation Deputy Chair

Commerce Commission

regulation.branch@comcom.govt.nz

Wellington Electricity
Lines Limited

85 The Esplanade
Petone, PO Box 31049
Lower Hutt 5040
New Zealand

Tel: +64 4 915 6100
Fax: +64 4 915 6130

Dear Andy

Feedback on fit for purpose regulation

Wellington Electricity Lines Limited (**WELL**) thanks the Commerce Commission (**Commission**) for the opportunity to provide feedback on the 'Open letter—ensuring our energy and airports regulation is fit for purpose' (**Open Letter**). The actions proposed in the Climate Change Commission '2021 Draft Advice for Consultation' (**Draft Advice**) will result in a significant increase in electricity demand (Transpower Te Mauri Hiko & relevant updates). Like electricity generation and transmission, Electricity Distribution Networks (**EDB**) (and the supporting legislation, policy and regulation) will need to grow and develop to ensure that the increase in demand and reliance on electricity as a primary energy source can be met.

Before we consider impacts on regulation from pending legislative changes proposed by the Climate Change Commission advice to Government, the question of Fit for Purpose regulation should consider the outcomes of the current legislation to ensure there are no unintended consequences already requiring amendment ahead of considering Climate Change legislation impacts. It is important that a review of current performance is understood ahead of managing future performance objectives, to ensure there are no current systemic outcomes which need to be addressed. Some of these items are currently being discussed with the Commission.

While the climate changes actions haven't been confirmed, The New Zealand Government has committed to being carbon neutral and the most viable and likely solutions involve replacing fossil fuels with renewable electricity.

The fast-paced development of technology and its adoption will result in customers having more affordable choices for energy generation, storage and management within their homes, allowing new business models and power flows that turn the traditional distribution network into an active system which will require additional monitoring and coordination than the current price-quality system considers.

Where new demand is higher than the current network capacity, the increase in demand is traditionally met by building a larger network – bigger cables, larger transformers and higher capacity equipment to deliver more energy. New factors mean that traditional delivery methods (and the current regulatory framework) alone may not meet expectations of an affordable and secure delivery system:

- **The size of the increase in demand:** An initial calculation of the change in electricity demand needed to meet the Draft Advice actions shows an 80% increase. This represents an unprecedented increase in demand outside of what the industry is currently structured to deliver. This is in addition to demand increases from the new housing developments in response to the Wellington housing shortage.
- **Rapid uptake of electric vehicles:** The uptake of electric vehicles (EVs) is expected to be a cornerstone of carbon emission reduction. Construction of a larger network within an established urban environment takes a long time and it may be difficult to increase capacity of the network without managing this additional demand carefully.
- **New technology:** New technology allows consumers to generate, store and export energy from their home systems, effectively turning the supply system on its head. This will establish different value streams which will be reconciled across the distribution network as new and innovative services are developed. This will be supported by digitisation of many of the new devices allowing them to be aggregated and managed by a variety of vendors. This will require new rules and standards to ensure the distribution network remains stable, operates within expected limits and not deteriorate in either security or reliability.
- **Cost impact:** Building a larger network is expensive. Our early calculations show that if energy from EV's charging is not managed, it could increase peak demand by 80% which will cost hundreds of millions of dollars and could increase prices by 80% (nominal) over 30 years. A price increase of this magnitude could be unaffordable for a large number of consumers.
- **Time and resources needed to double the capacity of the network:** The significant increase in network investment will come at a time when other distribution networks, the transmission

grid and other industries like water and transportation will also be replacing, developing and growing their infrastructure in response to the climate change targets. A finite pool of skilled resource in New Zealand (and potentially globally as other countries reduce carbon emissions) could make this level of growth unrealistic.

In our submission to the Draft Advice, we outlined why new solutions are needed to better utilise the existing network to meet the Climate Change energy demands while delivering distribution services that are affordable and secure. Figures 1 show that if the new demand is not well managed then higher investment will be required to increase demand capacity. Conversely, if the new demand can be managed and capacity headroom utilised during the less congested day and night periods, then further network investment would become optimal and provide a longer-term benefit to customers.

Figure 1: Our approach to delivering the Climate Change emissions targets

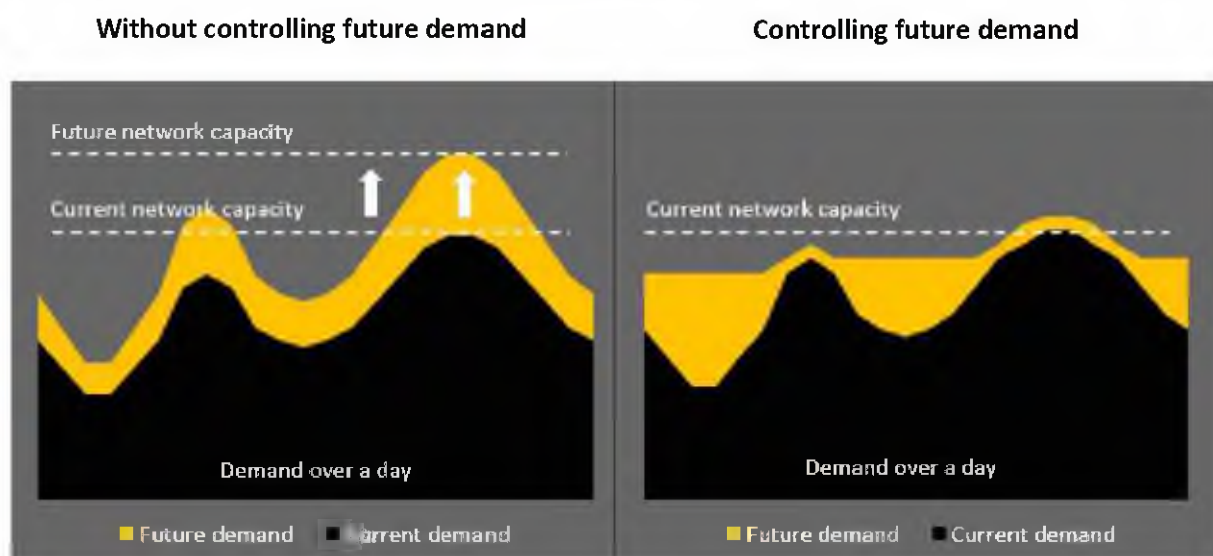


Figure 1 represents a theoretical view of optimising network utilisation to meet the proposed climate change actions. In reality we would expect that additional network investment is required to:

- Provide capacity for consumers who want to use electricity during peak demand periods and are willing to pay the cost reflective price to do so.
- Assist in maintaining a high level of network security. The Wellington network has a high customer density, so this allows a degree of interconnectivity to provide a secure system, particularly in underground areas. However, flattening the demand curve may require additional asset investment or services investment to maintain security levels.

- Re-enforce sections of the network that do not have enough capacity headroom to meet the expected increase in demand. Figure 1 does not represent every section of the Wellington network and some sections will need re-enforcing for existing demand growth ahead of climate change initiatives of EV adoption and reticulated gas curtailment.
- Provide extra headroom for sections of the network where we expect rapid growth and where demographic forecasts show existing capacity will be used up by new or emissions reduction growth.

We are in the process of modelling investment scenarios reflecting different levels of demand management. Our initial calculations indicate an investment of between \$0.5b and \$1b is needed to meet the proposed climate change actions, depending on the how much of the new demand we can move to less congested periods.

Our approach to meeting the climate change targets is to increase our community engagement and educate consumers on the sustainability benefits of demand side management particularly for energy storage. This has been summarised in the short animation video: <https://www.welectricity.co.nz/insights/show/climate-change-response/>.

Regulatory changes will be needed to support EDBs to make the additional investment in their networks and to develop demand management capability needed to utilise the capacity headroom the network provides in off-peak times. The new factors outlined above will also mean that the current regulatory model will need to be adapted to meet changing resource requirements and consumer expectations. This response to the Open Letter draws and builds on WELL's response to the Draft Advice which included changes that we believe are needed to the regulatory framework. Our response is structured to address:

1. Changes to the regulatory framework to build/repair investor confidence.
2. Changes to the regulatory framework to allow EDBs greater flexibility to deliver the proposed climate change actions.

Our response highlights the issues that we believe need addressing as part of the upcoming input methodology (IM) review or in another similar forum. As such we have focused on the issues to discuss rather than present possible solutions.

1. Changes to build/repair investor confidence

The climate change actions outlined in the Draft Advice will require investment in distribution networks. We estimate that the climate change actions will increase demand on the Wellington

network by 80%. This includes the electrification of the transport fleet and the transition from residential and industrial gas to electricity. Our early estimates indicate this would cost between \$0.5b to \$1.0b and increase prices by 40% to 80% by 2050 depending on how much of this increase falls during the peak network demand periods (in the morning and evening). Additional investment will also be needed to accommodate and manage Distributed Energy Resources (DER) like electric vehicles, solar and household batteries. This would include funding a Distribution System Operator (DSO) function through the support from further digitalisation of low voltage (LV) monitoring and management.

This investment is in addition to the investment needed to meet increases in demand from housing growth, commercial development and large asset replacement programmes. The Wellington network's underground cable and power transformer fleet replacements will fall at the same time as we are developing the capacity to meet the proposed climate change actions.

There are issues with the current regulatory framework which means that EDBs may not have incentives to invest as they will not be earning a real return consistent with the regulated cost of capital. A reasonable investor would not invest if they could not expect to earn a real return. Investors may not be willing to make the additional investment needed to deliver the Climate Change actions.

1.1. Inflation forecast errors leading to the under recovery of return on equity capital

The Commission targets a 'real return' for EDBs – the purchasing power of the return is maintained and is not eroded by inflation. However, the current treatment of inflation is resulting in EDBs under recovering the efficient return on equity capital and the allowances needed to cover debt funding costs. Specifically:

- a. **The inflation forecasting problem.** The Commission's estimate of expected inflation has (on average) been materially higher than actual inflation over the past decade. If the Commission's estimate of expected inflation exceeds investors' true expectation of inflation—which is plausible in the low-inflation environment that has prevailed over the last 10 years or so—then, EDBs will not receive the efficient real return on equity required in order to attract equity capital. This is because an over-estimate of investors' true inflation expectations results in too high a forecast of the inflationary gain in the RAB being deducted when the Commission sets EDBs' return on capital allowances.
- b. **The debt compensation problem.** EDBs issue nominal debt and are contractually required to pay nominal interest costs, but the regulatory framework delivers only a real return on debt

capital in each regulatory period. If EDBs have no effective way of aligning their actual cost of debt to the real return on debt allowance provided by the regulatory framework, then equity investors are forced to make up any shortfall if actual inflation turns out to be less than forecast by the Commission or gain if actual inflation turns out higher than forecast by the Commission.

A more detailed explanation of these issues was presented to the Commission in April 2021 by Aurora, Orion, Powerco, Unison, Vector and Wellington Electricity.

1.2. Under funding of operating costs

New operating costs or above inflationary cost increases are not captured by the Default Price Path (DPP) allowance calculation. As part of the DPP3 consultation, the Commission identified \$59m in unexplained cost increases that were not captured by the DPP2 operating cost forecast mechanisms (Figure A1 and section A16 of the Draft Decision). As part of the Electricity Networks Association's (ENA) submission to the DPP3 Draft Decision, a report from NERA was submitted supporting a positive partial productivity factor to capture genuine cost increases not captured in the allowance calculation. The report highlighted that cost growth is limited to changes in the size of the traditional network (line length and number of ICPs) and no allowances are included for other drivers that might change operating costs over time (like aging networks, changing reporting and quality monitoring requirements, regulatory compliance etc.).

WELL's submissions to the DPP3 Draft Decision highlighted that the mechanism to capture specific new costs or above inflationary cost increases, the 'step' in the step and trend approach, is too rigid and known cost increases rarely pass the step change assessment criteria (the new costs must be significant, verifiable, not be captured in other mechanisms, outside of the distributors control and applicable to most EDBs). DPP3 submissions from EDBs requested step changes for a large list of cost increases, (e.g. increases in insurance levies, LV network monitoring, cyber security and tree regulation changes) were all turned down because they did not pass assessment. These cost increases are real and networks either have to forego other expenditure or overspend, receive an IRIS penalty and forgo earning a real return (all other profit inputs being equal). Networks do try to find efficiencies to fund new costs, however, as shown by the Commission's analysis of the effectiveness of the IRIS mechanism presented as part of the DPP3 consultation, EDBs have not been able to make savings even with a 34% incentive to do so. Any potential productivity savings has been offset and exceeded (as highlighted by figure A1 and section A16 of the Draft Decision) by cost increases not allowed for in the DPP2 allowances.

New network investment driven by the proposed climate change actions will also require an increase in supporting operating costs (i.e., to maintain and manage the new assets and to purchase demand management services to manage the new demand). Under the current DPP regime, network operators cannot be confident that they will receive the opex allowances to do so effectively, further increasing the risk of earning returns less than regulatory WACC.

1.3. Customised price path framework

The Customised Price Path (CPP) intentionally provides the Commission with a high degree of flexibility when setting prices and transitioning onto a new price path at the end of the CPP regulatory period. CPP applications are for unique, non-business as usual investment programmes that by nature require regulatory flexibility. However, this flexibility can lead to uncertainty in what allowances may be set for a CPP and how the supporting mechanics of the determination may be applied. Some costs are also unrecoverable. This uncertainty can result in EDBs earning less than a real return. Specific examples are:

- The unrecoverable CPP application costs (that are usually in the millions) means that an EDB is unlikely to be made whole for their investment in medium size investment programmes.
- New CPP approved reoccurring operating costs that fall for the first time in the last year of a CPP regulatory period are not necessarily captured and included in the next price period. For example, DPP operating costs are based on the second to last period of the previously regulatory period which would miss any new costs that fall in the last year. Inclusion of these costs relies on the judgement of the Commission and is not certain.
- The method for transitioning to the next price period is made at the discretion of the Commission and is made towards the end of the CPP regulatory period. The transition method can result in very different allowances for the following price period – a building blocks approach could provide a different level of funding compared to extrapolating the CPP allowances. Certainty around the transition method would provide EDBs with the ability to implement the due diligence needed to avoid committing to a price-quality path that may not provide the ability to achieve a real return.

2. Changes to allow the delivery of proposed climate change actions

It is important that a responsive regulatory system is evolved to allow EDBs the flexibility to make the investment needed to deliver their decarbonisation targets. If EDBs cannot fund the development and implementation of tools to accommodate an electrified transport fleet, the transition from gas to

electricity and the electrification of manufacturing process heat, the electricity supply is likely to be disrupted by an unmanaged increase in load, leading to lower network security and delays in reaching the emission reduction targets. Without adequate regulatory support, New Zealand will not achieve its 2050 carbon neutral targets.

For a successful renewable energy solution to emissions reduction, then all three elements of sustainability, affordability and security need to be managed as a tripartite approach which needs to be supported by regulation which is flexible to meet this objective.

The current regulatory framework of providing a DPP for business-as-usual levels of investment and a CPP for a step change in business activities, works well for the operation of a traditional network with modest increases in demand. The funding for network growth and regular fleet replacements can be carefully and precisely managed to meet forecast growth rates and well understood asset performance profiles. The traditional and predictable investment profiles can be forecast well in advance of actual expenditure and can be generally managed within five yearly regulatory periods.

The significant increase in demand from the decarbonisation programmes and the change from the traditional response of building a larger network to using new technology to better utilise the existing network capacity means that the future environment of climate change adaption does not have the predictability and certainty of the past which the existing regulatory framework relies on. Specifically:

- The rate of the increase in demand is uncertain and networks will need to flex their investment programmes to meet that demand within a five-year regulatory window. For example, the size of government subsidies for purchasing EV's, timing on restrictions on petrol and diesel engines, the speed of transition from gas and the development of an EV charging network will all influence the speed of change in electricity demand.
- The types of services that consumers want will change rapidly – how and when consumers choose to charge their cars, whether they install solar and how they discharge household batteries are likely to change the networks demand characteristic. Investment in demand management and network re-enforcement will have to quickly adjust.
- The technology to improve the utilisation of the existing networks is new and is developing rapidly. The technology may also be offered as a service and purchased as operating expenditure rather than the traditional approach of capital expenditure. EDBs will not be able to accurately predict cost, cost type and capabilities five years in the future – EDBs will need

the ability to adapt their allowances to reflect quickly changing demand management solutions and this will require greater flexibility than that provided by current regulation.

The current regulatory model is a barrier to EDB's delivering their decarbonisation initiatives. The DPP framework may not provide the funding capacity needed and the CPP is cumbersome and expensive to apply, and its application is too uncertain for an EDB to be confident that they will be made whole for their investment. Specific concerns about the regulatory framework include:

- The DPP framework is backwards looking for the calculation of its operating cost allowances and relies on a "business-as-usual" approach continuing into the next regulatory period. New types of costs, like the purchase of demand management services, will not be captured.
- The increase in energy demand from EVs will be nation-wide and is likely to impact urban EDB's more so than rural EDBs. The speed of EV uptake will also differ between EDBs, with urban networks likely to see faster EV growth than rural networks. New Zealand's decarbonisation initiatives will mean there is no 'business-as-usual' scenarios that suits the DPP, and the higher levels of funding are likely to become the norm, rather than the one-off exceptional circumstance a CPP regime was designed for.
- The unrecoverable CPP application costs (that are usually in the millions) means that an EDB is unlikely to be made whole for their investment in medium size investment programmes.
- For many networks the investment to meet the decarbonisation targets may be modest but too large to be captured by the business-as-usual DPP framework and are not large enough to represent an operational change or investment to require a full CPP application. Applying for a CPP is an expensive, complex, whole of business process.

We support refining the current regulatory framework to provide EDBs with a price path which has the flexibility to meet changing demand, changing customer services and new delivery solutions.

Options to provide regulatory flexibility could include:

- An individual price path using consistent and repeatable review processes. It is likely that networks will need to invest over multiple regulatory periods. An individual price path with consistent and repeatable review process will allow an EDB to adjust their expenditure levels at a lower administration cost than a CPP.
- Refine the DPP framework to keep regulatory compliance costs as low as possible and allow one-off projects outside of the capex gating with additional scrutiny.

- Allow a 'streamline' CPP like WELL's earthquake readiness programme. A network would remain on a DPP for its business-as-usual operations and the higher level of CPP scrutiny would apply to a specific investment programme.

Some flexibility was added during the last DPP reset – the re-opener for new customer growth provides EDBs with an important ability to re-open the price path for unexpected growth. The upcoming IM review provides another opportunity to add further flexibility.

In addition to adding flexibility to the mechanisms used to calculate allowances, a change is also needed to the strategic treatment of investment risk – specifically the risk of overbuilding networks. Traditionally, investment into distribution networks could be precisely managed using well understood and predictable investment profiles and asset lives. Predictable changes in growth and asset replacement programmes means the Commission can be confident that networks aren't over or under investing. However, as previously discussed, the rate of the increase in climate change driven demand is uncertain and new technology is changing the services that consumers want from their distribution networks. New network capacity and capability takes time to develop, and networks may no longer be able to match network capacity with new growth as well as it has in the past. Additional capacity may have to be built earlier than necessary to provide a buffer against faster than expected growth. Conversely, demand management tools may be required where networks can't be built fast enough to meet rapid demand increases. The industry (including regulators) will have to consider how to balance investment and uncertain demand – how to measure and trade-off the risk of overinvesting with the risk of networks not meeting future demand expectations and being unable to deliver the proposed climate change targets.

The consequence of the network capacity not keeping pace with changes in consumer demand has been seen in overseas jurisdictions. In Australia, government incentive schemes contributed to the rapid uptake of customer DER, specifically solar. Networks were not able to accommodate the rapid increase in new devices and had to curtail solar exporting electricity back into the network so they could maintain a secure and stable network service. Consumers and the Government were not able to realise the full benefits from their investment in household solar devices.

2.1. Understanding and adapting to changing consumer preferences

New consumer devices are changing how consumers use electricity. For example, EV's are significantly increasing household demand. Our EV trail showed that a small charger will increase household energy use by 35%. Large chargers use significantly more energy, reduce demand diversity and may cause

electricity use to exceed the safe capacity of the standard household connection. Household batteries and solar devices introduce two-way power flows that can cause network voltage and stability issues that current networks haven't been designed to cope with.

In the future there are likely to be new devices that will have further unexpected impacts on distribution networks. EDBs will need to understand what distribution services consumers want and what services customers can offer EDB's to orchestrate the stability of the network. EDB's will need to continue to educate consumers that sustainable outcomes also need to consider balancing security and affordability dimensions so that trade-offs are properly considered especially if this results in cost cross-subsidisation or equity issues. Consumers will need to make informed price/quality decisions about what future services they would support. This will require a level of investment in retailer/customer communication that EDBs are not funded or structured to provide currently.

Consumers will also need to make a decision about what network reliability they want when networks develop the tools and methods to deliver the proposed climate change actions. Our proposed approach of shifting demand to less congested periods will help keep prices low, however, it could reduce supply security levels and has reliability implications. The current capacity headroom on the Wellington underground network is used to provide a high level of network reliability. The Wellington network is designed to allow electricity to be redirected across the network if a section of the interconnected urban network is short of capacity. If the capacity headroom is used up, WELL will have less ability to re-direct electricity and the electricity supply will be less reliable and consumers will see more outages.

Some headroom is needed to provide a buffer to allow us to manage demand and maintain a secure supply. Consumers will need to decide what level of reliability they want. Do they want to use a large portion of the network capacity and reduce the size of the network build needed to deliver the climate change actions? This approach keeps prices as low as possible but decreases network reliability. Or do they want to build a larger network that has more spare headroom for a higher price but better reliability?

EDBs will need the ability to have direct and more informed communication with end consumers so consumers can decide what distribution services they want to use or services they can provide back to the utility and are willing to pay for or be paid for – like two-way power flow, the network of the future will likely have two-way economic flows. Better communication is also needed so consumers

can decide what approach they want to take to deliver the climate change actions – do they want to pay more and have a better reliability or do they want to pay less and have a less reliable network.

2.2. Innovation

DDP3 included the introduction of an innovation project allowance for up to 50% of the total cost of approved innovative projects in the assessment period, but not exceeding 0.1% of the total allowance in the regulatory period. While this innovative fund is in line with Part 4 of the Commerce Act to promote the long-term benefit of consumers, the actual allowance amount is insufficient for EDBs to deliver the innovation projects that are needed to deliver the zero carbon targets. Specifically, the fund is too small to support the level of investment needed to trial and introduce new demand management services or LV monitoring alternatives. As outlined earlier, new technology and changing expectations around how consumers will use their DER will mean that traditional network solutions may not be appropriate. EDBs will need to develop new solutions quicker than they have done in the past. Allowances should be adjusted to cater to the higher research and development requirements – the consequence of under investing in innovation will be solutions that don't meet consumer expectations, do not deliver the climate change actions or are not the most efficient solution for consumers.

As part of the DPP3 re-set process the Commission provided evidence that the industry is underinvesting in innovation when compared to other sectors (section 4.54 of the DPP3 Draft Decision). This was a similar result to what Ofgem found in the UK until they established an innovation incentive scheme. We encourage regulators to consider Ofgem's approach of managing an increase in innovation expenditure through a contestable innovation fund where EDBs bid and share successful ideas. The upcoming IM review provides an important opportunity to align the innovation incentives with the size of the upcoming development programmes.

3. Addressing these issues

As highlighted earlier, external factors (like changing technology and customer expectations) will mean that traditional business processes may not deliver the increase in electricity demand resulting from the proposed climate change actions. Significant changes may be needed to the regulatory frameworks to provide greater flexibility to support the delivery of distribution services. The current regulatory consultation process is good for making minor refinements under a business-as-usual environment, but we believe more time is needed for more complex issues.

Sufficient time will be needed to identify and understand more complex issues, develop least regrets solutions and debate the most appropriate response. This consultation will highlight what the complex issues will be. We believe that solutions to these issues should be developed in advance of the IM review process. A draft solution could then be refined using the standard consultation process of issues paper, draft decision and final decision.

4. Workshops

To develop draft decisions in advance of the IM review, WELL suggests using industry working groups to develop options and then workshops with the Commission to refine those options. We commend the Commission for the two workshops it did hold for the DPP3 but believes they were too large to allow the co-ordinated development of solutions and to then debate the pros and cons. The DPP3 workshops were useful to answer stakeholder questions and to clarify the draft decisions but were the wrong format for more in-depth discussions. Workshops with representatives from each stakeholder group would provide an effective forum. A smaller number of participants will allow a more interactive discussion.

5. Closing

Thank you for the opportunity to outline the Climate Change related implications for the regulation of electricity distribution. Meeting the increase in electricity demand is a complex challenge and represents a significant change in the industry. Ensuring EDBs have the allowances, tools, and investor confidence to develop their networks and demand management capability will be an essential step in delivering New Zealand proposed Climate Change targets.

The issues are complex, and we believe significant change is needed to move from a business-as-usual regulation to a more flexible set of regulatory tools. We encourage the Commissions to consider the extra time and resources that may be needed to deliver a fit for purpose framework. Networks will soon need to start investing in new capacity and capability so small incremental changes to the existing regulatory model may hamper a network businesses ability to meet the proposed climate change targets. We look forward to working with the Commission to develop and refine the regulatory model. If you have any questions or there are aspects you would like to discuss, please don't hesitate to contact Scott Scrimgeour, Commercial and Regulatory Manager, at sscrimgeour@welectricity.co.nz

Yours sincerely

A handwritten signature in black ink, appearing to read 'G. Skelton', written in a cursive style.

Greg Skelton

Chief Executive Officer

Wellington Electricity Lines Limited