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By email: Robert.Bernau@comcom.govt.nz, CC: regulation.branch@comcom.govt.nz

Dear Rob,

Vector response to Commerce Commission priorities for the EDB sector for 2017/18 and beyond

Executive summary

1. Vector considers the foremost issue for the electricity distribution business (EDB) sector is developing a customer¹ focused model for asset management. There is great risk for EDBs to continue to ignore the customer in their asset management processes and decisions.
2. The opportunity for customers to influence and manage their energy requirements has increased dramatically over a short period. Innovation has occurred from surprising sources as the retail electricity market has underwhelmed customer expectations.
3. Accordingly, asset management must embrace sophisticated customer analysis for asset management decision-making. Data driven insights enables more advanced assumptions around load growth and energy demand – reflecting the greater depth of customer preferences.
4. Data driven decision-making enables more flexibility with EDB asset management including probabilistic system planning, innovative load control, platform development and technology options for addressing system and customer needs. A traditional approach to asset management will result in assets being commissioned that are not fulfilling the needs and preferences of customers. This may burden future generations with contributing to assets that are not required or perform sub optimally. Innovation needs to be fostered by Part 4 otherwise the sector risks continuing down the same path.
5. Vector has the challenge of operating in New Zealand's most economically critical and fastest growing region, along with the associated infrastructure challenges. We have

¹ In this submission, the term customer refers to the end-user and not retailer given Part 4 is drafted with the end-user in mind

unique resourcing challenges that will need to be addressed so we can enable development for the region.

6. New Zealand must learn from international experience about resilient electricity systems. Resilience can be achieved through different means with different implications for customers. We caution against outmoded models of resilience which may not deliver outcomes when the electricity system is subject to an external event or cater for emerging system threats.

Introduction

7. The Commerce Commission's (Commission's) open letter is a timely engagement with the electricity distribution business (EDB) sector to develop its strategic direction for the next year and the recalibration of the default price path (DPP) in 2020. This consultation provides an opportunity for the Commission to establish its vision for the long-term benefit of consumers.

8. In this submission, we provide:

- A summary about Vector;
- Context about the current state of the sector and the challenges and opportunities posed by new energy technologies;
- The benefits customers are receiving from Part 4 and retail electricity competition;
- The importance of data driven decisions for enabling sophisticated asset management strategies;
- Issues for consideration when assessing customised price path (CPP) applications;
- The challenges for EDBs lacking scale and scope to develop new capability;
- The importance of the Auckland region and relevant issues for meeting the expectations of Auckland growth;
- Considerations for resilience and the importance of having digital resilience capability;
- The importance of measuring customer satisfaction for service quality; and

- Addressing the challenges of sustainability and climate change in the Part 4 context.

About Vector

9. We provide our electricity distribution service in New Zealand's largest city, the country's most significant commercial precinct and fastest growing region. We recognise the importance of having the right levels of supply security, investment and electricity affordability for operating in this pivotal region for New Zealand's economy. Our network extends from Wellsford in the North covering the North Shore and the Waitakere Ranges and to Papakura and Manukau in the South and includes the island regions surrounding Auckland including Great Barrier Island and Waiheke Island.
10. Vector is an energy and technology service provider with a portfolio of energy technology businesses. In addition to our Auckland electricity network, Vector's energy interests include:
 - A gas network covering over 100,000 dwellings in the Auckland region;
 - Advanced metering services, which has deployed more than one million meters throughout New Zealand, and recently commenced deploying smart meters in the Australian national electricity market (NEM);
 - Ventilation, heating and water purification through our HRV business, which has recently added residential solar technology to its offerings;
 - Commercial scale solar energy and storage solutions in New Zealand and the Asia-Pacific with our PowerSmart business which has installed the largest solar array systems in New Zealand;
 - Wholesale gas trading and processing;
 - OnGas, which provides bottled gas solutions to commercial and residential customers across the country; and
 - Vector communications, a specialist communications provider offering business grade data communications connectivity for commercial customers.
11. We have pioneered capability with electricity storage. In October 2016 Vector installed the then largest grid Tesla battery in Australasia holding 1MW of capacity at its Glen Innis

substation. More recently, Vector's development team is progressing with the installation of a 5MW battery system in Alice Springs, Australia. We have leading capability with off-grid solar solutions. PowerSmart has designed and commissioned solar energy off-grid systems at commercial scale across New Zealand and in the islands across the Pacific. Our HRV business provides a comprehensive in home energy solution for households optimising energy usage through a combination of ventilation, heating and, more recently, solar and battery technologies.

12. Vector is 75 percent owned by the community trust, Entrust. Entrust represents beneficiaries across the Auckland, Manakau, Papakura and Franklin regions. Our consumer owned model provides an important discipline for ensuring our investment reflects our customer's preferences. The balance of Vector's ownership equity is listed on the NZX. Having an engaged majority shareholder with a direct customer mandate ensures we are spending capital prudently and not merely gold-plating for long-term revenues.

New energy technology is challenging boundaries and creating convergence opportunities

13. The boundaries for the current electricity supply chain and market were conceived in the 1990s. At that time, competition policy makers believed full retail competition in select parts of the electricity supply chain would unlock value from previously sheltered industries.² Unfortunately, a common experience internationally for markets that have followed this model has been engrained market shares of retail incumbents and limited innovation and value being passed on to end-users.
14. We are now approaching an era where technology is obviating historically relevant demarcations. Continuing to apply a model of competition not contemplated for the energy innovations being developed today is unsustainable. The convergence opportunities enabled by new technology must be fostered and not limited by regulation.
15. **We recommend the Commission appreciate the convergence opportunity created by new energy technology and refrain from trying to compartmentalise use of the technology within traditional boundaries.**

Part 4 is being muted by an underperforming retail market

16. The retail energy market is characterised by limited competitive intensity and dominated by incumbent retailers. Despite the volume of retailers, the market continues to be

² See, for example, Hilmer et al, *National Competition Policy: Report* (25 August 1993)

characterised by the concentration of five incumbent retailers comprising about 90 percent of the market.

17. Indeed, the volume of customers switching retailers (excluding customers moving house) has failed to exceed 10 percent over the last three years. This suggests customers are not engaged with the market. Furthermore, there is limited competitive pressure for retailers to ensure their customers are satisfied. This is evidenced by a persistence in the market for keeping customers on suboptimal tariffs for their energy requirements.
18. The current state of the retail market has resulted in regulated cost changes not being passed through to consumers. Under Part 4 we have had pricing adjustments of greater than 10 percent and have not seen any corresponding changes to retail offerings.

19. We recommend the Commission:

- a. **Impose more onerous obligations for retailers to minimise the occurrence of customers placed on suboptimal tariffs for their electricity requirements; and**
- b. **Prescribe the pass-through of regulated price changes by retailers to ensure customers are receiving the benefits of Part 4 regulation.**

Understanding the customer

20. Customers are more empowered with their energy usage and consumption decisions than ever before. This empowerment has occurred despite, rather than fostered by, the competitive retail market and increasingly enabled through new solutions. Today's customer is persuaded by a range of considerations, beyond prices only. Such considerations include comfort, security, choice, sustainability and independence. Historically there was very little opportunity for customers to influence their electricity consumption other than incur discomfort or refrain from productive activity. This has changed in the last decade with the pace of change expected to accelerate.
21. No longer is it reasonable for an EDB to make long-term irreversible decisions and assume usage will gradually increase over time in line with local economic activity. Historically, the margin of error of getting system growth planning decisions wrong was a few years. EDBs could confidently depend on demand catching up to justify investment. On the Vector network, we have seen per user energy consumption decrease by over 10 percent over the last decade. This persistent trend defied most expectations around electricity consumption.
22. Understanding the customer is an important part of being an EDB today. EDBs can no longer continue to consider themselves a hidden component in a convoluted supply chain.

This will become even more critical as the market matures to enable multiple traders at a customer's premise, peer-to-peer trading and other new energy solutions for customers.

23. Customers are demanding more engagement with their EDB. They expect instant information and responses to their concerns. The benchmark for customer responsiveness has increased significantly across the commercial sector and EDBs must operate to those expectations. This requires developing capability with functions historically not associated with EDBs.
24. Asset management has become more complicated and understanding the needs of customers is an increasingly complicated area. EDBs cannot work in the long term interests of consumers if they do not understand the needs, preferences and trends of their customers.
25. **We recommend the Commission:**
 - a. **Recognise the importance of customer preference for asset management;**
 - b. **The resourcing demands created from providing instant customer service through an increasing range of communications channels; and**
 - c. **Create incentives through its quality regime for EDBs to adopt customer focused asset management as the traditional model will result in networks misaligned to their customers' needs and expectations.**

Data driven decision-making

26. In an era of empowered customers, the traditional role of the EDB conveying energy in a unidirectional supply chain will not meet the expectations of the customer. We see significant risk for EDBs to continue to operate or be incentivised to behave in the same "traditional" manner. There is an increasingly important role for behavioural economics in developing a better model of tomorrow's electricity customer. Below presents but just one example of the increasing complexity customers present for networks.
27. Data driven insights are a fundamental need for any business. We believe it is irresponsible for EDBs to manage electricity networks without the benefit of granular information. Data driven insights will result in more tailored strategies meeting the needs of customers than would occur otherwise. Vector is at the frontier of data driven asset planning which has significantly changed our asset management practices.
28. EDBs are at the forefront of ensuring we enable, not hinder, what customers want. For example, electric vehicle (EV) adoption has the potential to radically change the demand profile for the network as our transport fleet transforms. However, there are a range of

customer behaviour and technology decisions that will significantly influence the impact of this technology on the network.

29. Peak time EV charging and the emerging possibility of transport-as-a-service (TaaS) are two possible trends with significant implications. At the same time the technology options for transportation will increase in complexity and variety with more fuel types competing for dominance including EVs, significantly more efficient combustion engines and hydrogen vehicles as forefront technologies. We discuss later in this submission the impact EV penetration will present for networks.
30. History is full of examples of where consumer preferences have defied economics and technical capability. Most famously, the format wars between Sony's Betamax and JVC's VHS during the 1980s for picture recording was ultimately decided by consumers selecting VHS despite the superior properties of Betamax. During the 2000s the rollout of second generation of mobile networks also resulted in a similar tension between code division multiple access (CDMA) and global system for mobiles (GSM). While CDMA possessed the superior propagation, most network operators globally opted for GSM based on customer preferences and regulatory settings in Europe.
- 31. We recommend the Commission recognise resource requirements and assist with reducing the information barriers for EDBs to develop customer insights and data analytics capability and use it for asset management decision making. This will reduce the risk of inappropriate system design, investment and technology forecast error.**

Sophisticated asset management strategies result from data driven analytics

32. Sophisticated data analysis must be part of the tool kit for responsible asset management for EDBs. The ability to gain insight into customer energy usage at the most granular level will enable EDBs to make the right investments at the right time as well as creating more efficient options to meet customer needs rather than building yesterday's network for the future. The speed of change in energy innovation is accelerating and asset management strategies will need to adapt and pivot in response to such change. EV take-up and penetration is an example of uncertainty for asset management strategies.
33. The charging capacities offered by new model EVs range from 2.4kW to fast and rapid charging at 22kW and 50kW respectively. To put this in perspective a standard dwelling tends to operate at 2.5kW capacity. Therefore, a new dwelling installing an EV charger has the effect of adding between 1 to 20 houses on a line.

34. However, EVs are not the only technology innovation. There are a range of technology and energy efficiency solutions that can dramatically change customer energy usage including new developments in energy efficiency, demand response, solar PV and battery technology. Taking anything less than a sophisticated approach to understand the impact these new technology trends and changing customer usage will result in either significant under or overinvestment.
35. Deterministic planning results in more system augmentation and risks significant over investment. This is because it will overbuild capacity to meet forecast demand and typically does not explore technology options as a more flexible method to augmentation. We see significant risk with asset investment strategies relying on deterministic planning for system investment given the significant uncertainty with future load prospects. Deterministic planning puts greater risk of assets being commissioned with very low long-term levels of utilisation which is not in the interests of customers.
36. Vector's approach is probabilistic planning further enhanced by customer insights and data analytics. We realise system demand is becoming more uncertain and probabilistic planning provides a more cost-efficient approach for investment consistent with the long-term benefit of customers. We believe probabilistic planning is a more responsible and economically efficient approach for system planning and augmentation. We estimate by 2025 we will have saved approximately one billion dollars through a combination of probabilistic planning and technology adoption.
37. We are leveraging our analytics capability to develop detailed energy use scenarios to assist with network planning decisions. Our modelling provides an intelligent basis for understanding different technology and customer usage futures and will materially assist with developing planning and contingency responses for different load or event scenarios.
38. While probabilistic planning and scenario modelling assists with reducing the exposure of unforeseen changes in customer demand and usage, it does not protect against the risk of partial capital recovery. Therefore, we support measures such as accelerated depreciation to provide more confidence for capital investment.
39. **We recommend the Commission appreciates the shortcomings with traditional deterministic asset management planning for consumers resulting in potentially unnecessary assets being commissioned. The Commission must consider financial incentives for encouraging EDBs to adopt more sophisticated strategies for asset planning given the overall long-term cost savings for consumers and, potentially, penalise those who cannot demonstrate a sophisticated customer focussed asset planning methodology.**

Rewarding innovation

40. Vector is committed to embracing disruption and new technology to deliver smarter cost efficient solutions for customers. This framework is open to abuse by investors simply seeking to deploy capital to take advantage of tax policy and related company financing to maximise returns.
41. The framework limits the take-up of new innovations for addressing classical electricity system needs. The dependence on long life assets risks inter-generational inequity where future generations may question their contribution to assets which have limited benefit to them.
42. The Commission's current approach to setting DPP/CPPs does very little to incentivise innovation. However, Part 4 of the Commerce Act was drafted with the foresight of explicitly recognising innovation as a fundamental part of advancing the long-term benefit of consumers.³ There is an imperative for the Commission to allow for and incentivise innovation. At the same time, the Commission needs to discourage legacy asset design practices which risk creating the circumstances that exist in other jurisdictions of over-engineered and under-utilised networks.
43. We agree with the Commission that network renewal is more challenging where technology and customer preferences are changing. Simple asset management involves merely renewing end-of-life assets with an old for new swap. However, there are a wide variety of alternatives with asset renewals. Networks will need to embrace new technologies and the forward needs of customers. Vector is at the forefront with its asset management and innovation strategy. An example of this is our development of the smart pole. The smart pole has changed the form and function of a traditional power pole from being a passive network asset to providing multiple network capabilities and enhancing performance. EDBs need to affect their renewals to create the network of the future. This will involve customers demanding to be able to "plug and play" their new energy technologies.
- 44. We recommend the Commission must consider how to incentivise innovation into all aspects of an EDBs operation to deliver better outcomes for customers.**

³ For example, s52A(1)(a) of the Act includes "incentives to innovate" within the purpose of Part 4. s54Q requires the Commission to promote incentives for EDBs to invest in energy efficiency and demand side management.

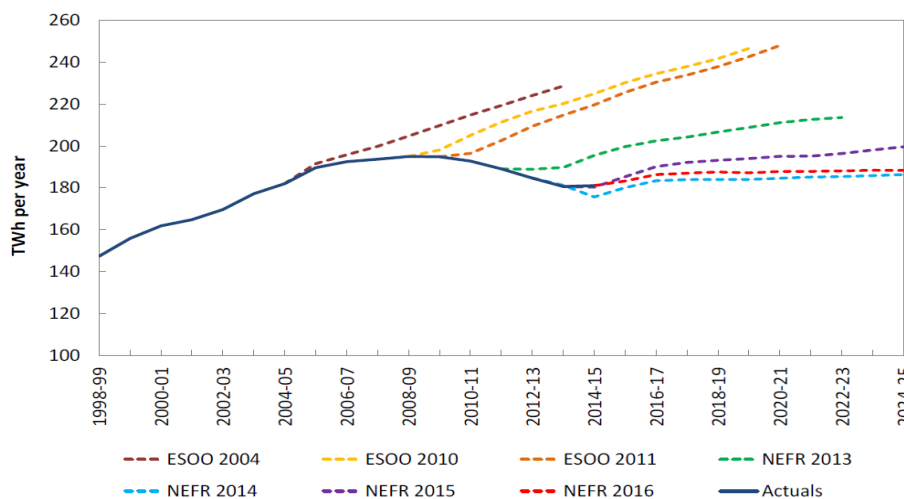
The risk of getting it wrong – recent history from Australia provides learnings

45. Recent history from Australia demonstrates the consequences of less sophisticated energy forecasting by networks.

46. In this respect, the Australian Energy Market Operator (AEMO) which periodically forecasts electricity demand for the market consistently over-estimated electricity demand with each of its annual demand forecasts for over a decade. The AEMO forecasts since 2004 all predicted an acceleration in demand in electricity energy usage growth and failed to predict energy usage plateauing, and more recently, declining.⁴ Indeed, the Australian Competition and Consumer Commission (ACCC) found electricity assets installed in this time are being underutilised. **Graph 1** shows the difference between AEMO’s forecasts of electricity demand and actual demand since 2004.

Graph 1: AEMO electricity energy usage forecasts and actual electricity demand

Figure 3.12: Difference in actual and forecast demand



Source: ACCC Preliminary report retail electricity pricing inquiry

47. **Graph 1** shows actual electricity energy usage in Australia’s NEM was significantly lower than annual projections in TWh per year by the AEMO by a significant margin over an extended period. The pre-eminence of a single energy forecast and failing to consider different scenarios for electricity usage appears to have driven a significant departure between forecasted and actual electricity usage over the decade.

48. Imprecise load forecasting and security criteria resulted in networks across the NEM especially in Queensland and New South Wales expanding their capital programs and

⁴ Australian Competition & Consumer Commission, *Retail Electricity Pricing Inquiry: Preliminary Report* (22 September 2017), p. 110

significantly increasing the volume of their regulatory asset bases since 2004. Accordingly, the impact of investment decisions allowed for in the previous decade are materially contributing to the high costs customers are paying today in those jurisdictions.

Customised price paths

49. The Commission appears to be creating the same risk for parts of New Zealand. As discussed above, a simple “traditional” approach to load forecasting for system augmentation does not work in an era of more empowered electricity customers.
50. We note an emerging theme for the need for a CPP has been to address an extended period of historical under-investment in the network. We acknowledge the risk with recognising this need. It does create risks for perverse asset management strategies. This is because customers are expected to pay for the investment “catch up” program over the CPP period and over the longer-term.
51. The Commission appears to be encouraging the asset management equivalent of moral hazard. We encourage the Commission to consider the implications its decisions around CPPs. These concerns should be distinguished from a CPP driven by other motives than historical under-investment.

Scale and scope necessary for capability

52. We recognise developing new capability is difficult in New Zealand where several EDBs operate without sufficient scale and scope in their operation. We encourage further consideration of how the Commerce Commission may incentivise centralising functions and cooperation across EDBs to ensure new capability can be developed across the country and eliminating the current barriers posed by limited scale and scope.
53. At the same time, we continue to support the community trust model as a preferred ownership model. We recognise customer ownership provides an appropriate discipline for ensuring investments and prices are in line with customer expectations. Moving away from a community trust owned model risks perverse incentives from new owners looking to invest capital to benefit from generous inter-company financing arrangements and tax policy instead of genuine network and customer concerns.
54. **We recommend the Commission consider means for incentivising cooperation amongst EDBs operating at less than minimum efficient scale.**

The Importance of the Auckland region

55. Auckland is experiencing rapid growth, which has created pressure on infrastructure and essential services. It is vital the region is resourced to meet the challenges presented by growth given New Zealand's economic prosperity is interlinked with that of Auckland.
56. New Zealand Trade and Enterprise recognises Auckland as New Zealand's international gateway.⁵ Auckland is the commercial hub for the country and has the important function of integrating New Zealand's economy into the Asia-Pacific. This is a key component in New Zealand's economic strategy.⁶ Auckland attracts most of New Zealand's knowledge intensive foreign direct investment (FDI).⁷ It is ranked in the top five Asia-Pacific cities of the future for FDI strategy⁸ and has been ranked in the top 50 of the most competitive cities globally.⁹
57. Vector is integral to enabling Auckland's growth. In the last five years alone we have spent 1.2 billion dollars servicing the electricity needs for the region. An example of this commitment to enabling Auckland's development is our improved supply security to the Auckland CBD with our recent upgrade of the Liverpool Street substation.¹⁰ We are committed to servicing the region by harnessing capability and technology wherever we can to ensure the city has enduring and affordable electricity infrastructure over the long run.

Auckland is growing at a rapid pace

58. Auckland is currently growing at three times the global average. Approximately half of all new migrants in New Zealand settle in the Auckland region. The recent increases to Auckland's population is unprecedented. Vector is responsible for providing the enabling energy infrastructure to facilitate this growth. New Zealand Treasury (Treasury) has acknowledged Auckland's ability to absorb growth has been reached. Treasury has suggested a holistic and strategic approach across government, local government and the

⁵ New Zealand Trade and Enterprise, *Auckland Investment Profile* (December 2016) available: <https://www.nzte.govt.nz/-/media/NZTE/Downloads/Investment-and-funding/Regional-investment-profiles/Auckland-investment-profile.pdf>

⁶ For example, see the Ministry of Foreign Affairs and Trade's current NZ Inc Strategies. These fall within the Business Growth Agenda and are predominately focussed on the Asia-Pacific region.

⁷ ATEED, *Auckland: An Emerging Knowledge Capital of the Asia-Pacific* (March 2017) available: https://www.aucklandnz.com/sites/build_auckland/files/media-library/documents/J000922_Paper_2_FINAL_Knowledge_capital.pdf p, 5

⁸ fDi Intelligence, *Asia-Pacific Cities of the Future 2017/18* (August/September 2017) available: <https://www.fdiintelligence.com/Rankings/fDi-s-Asia-Pacific-Cities-of-the-Future-2017-18-the-winners>

⁹ The Economist Intelligence Unit, "The Global City Competitiveness Index" (2012) available: <http://www.eiuperspectives.economist.com/economic-development/hot-spots/white-paper/hot-spots>

¹⁰ See Vector Ltd, *Asset Management Plan 2013 – 2023* (2013) p, 144 - 148

private sector is needed.¹¹ It also cautions against infrastructure investment processes following business as usual at a time when there is a need to reflect more urgency and ability to deliver at pace and greater scale.

59. Developers in the region all note the relative ease of engaging with Vector compared to other life-line regional utilities such as water reticulation for new developments. This is despite our new recent restrained approach to gas reticulation following the setting of the gas distribution business DPP in 2017.
60. In 2017 we received a record number of new development requests with record volumes of new connections being exceeded multiple times throughout the year. To put this in context our new connections for 2017 was 70 percent higher than for 2013.¹² We anticipate this level of development will continue given the emphasis and commitment to address Auckland's growth. We are involved in every respect of any initiative to address Auckland's growth whether directly or indirectly. Our capability to support the growth will only be tempered by our resourcing to do so.
- 61. We recommend the Commission consider within its ability to tailor the DPP to specifically recognise the cost, growth and customer differences in Auckland relative to EDBs operating in other regions across the country. Due to the additional living costs for operating in this region, we have the challenge of attracting and keeping resources in Auckland – which EDBs in other parts of the country do not experience. Failing to address this issue will result in Vector being under-resourced for enabling infrastructure initiatives underway in the region thereby compromising regional economic growth.**

Resilience

62. We recognise electricity delivery is a key life-line utility service that customers rely upon. Resilience captures both the capability to withstand and react to external events such as natural disasters and to ensure service delivery with minimum disruption. Having the right balance between reacting versus withstanding is important to ensure the EDB has the right capability for responding to external events. More importantly technology, regional independence and shared capacity must be recognised as enablers for achieving a resilient electricity system.

¹¹ The New Zealand Treasury, *Briefing for the Incoming Minister for Infrastructure* (October 2017), p,7

¹² This comparison is on a July-June financial year basis

63. We agree with New Zealand Treasury's observation that "increased resilience is not necessarily about making things stronger or investing more, and is quite often achieved by operational changes."¹³ We do not believe aggressively renewing a wooden pole fleet provides any more significant resilience for customers. The impact of unseasonable weather, debris and natural disasters is no more certain by this investment.
64. Recent events locally and internationally reinforce the need for more innovative thinking around the principles for resilience. The severe storms in South Australia in December 2016, Hurricane Sandy in New York in October 2013 and the 2011 Japanese earthquake and tsunami resulted in radical departures in electricity network design. Following these events, the importance of local independence has been a feature of the redesign of the electricity system in these jurisdictions.
65. In the case of New York, the "Reforming the Energy Vision" regulatory reforms initiated post Hurricane Sandy include explicit incentives encouraging more distributed generation and local independence as legitimate network alternatives.
66. In Japan, where resilience has been a central focus for the redesign and rebuilding of the country's power system, regional autonomy and local consumption has been the model for achieving electricity resilience. The northern regions of Japan have been redesigned with a significant focus on micro grids to deliver resilience from similar events to the 2011 earthquake.
67. The approach these jurisdictions have taken to reconstructing their electricity system infrastructure for resilience is a marked contrast to the New Zealand understanding and application of this objective. The rebuilding of Christchurch and the post-mortem from the Kaikoura earthquake have not considered the advantage of new energy technologies for resilience. Indeed, the opportunity to enable local independence and shared capacity in electricity systems are critical enablers to withstand and rapidly respond to external events.
- 68. We recommend the Commission thoroughly assess its understanding and approach for resilience and ensure it has the right balance between withstanding and responding to external events and customer expectations. We also strongly encourage consideration of recent international learnings for resilience where new technology and local independence have become relevant design features and the expectations this has on the ability to withstand and respond.**

¹³ The New Zealand Treasury, *Briefing for the Incoming Minister for Infrastructure* (October 2017), p, 9

Digital resilience

69. Network management is becoming more complex with increased digitisation, Internet of Things (IOT) devices and distributed generation technologies. Along with this, the ability to ensure that the network is both resilient and secure is becoming more difficult as the underlying systems and the distributed end points are further open in terms of protocols, communication channels and technologies. The importance of identification and authentication of end users and devices on the network is increasing. The opportunity digitisation offers is also subject to new heightened risks for networks.
70. This is increasing the span of responsibility of the network as the “edge” is expanding with more responsibilities for load management and technology integration. However, it also inevitably increases the risk of compromise of the network from targeted attacks. Monitoring, incident response and root cause analysis is more complex with the widening breadth of the network’s digital surface. Increased investment in network digital security is required to appropriately manage the ongoing challenge and constantly evolving risks.
71. The threat is not theoretical. In December 2015, the information systems of three electricity distributors in the Ukraine were compromised resulting in 230,000 customers being left without supply for up to six hours. Accordingly, the expanding digital breadth of EDB networks will require more resources and capability to protect against the unabating cyber threat. The current disclosure requirements for EDBs around asset management plans (AMPs) involve significant detail around asset management practices and network development and evolution. We have concerns about the level of disclosure required in EDB AMPs being disproportionate to the public interest about network management but disclosing sufficient information to assist digital interference from cyber threats.
- 72. We recommend the Commission recognise the new resources needed to deal with the threats increased digitisation has for resilience and supports the development of this capability which will not be reflected in historical costs of operation. We also strongly recommend there are requirements for AMPs to remove sensitive information that could be used by cyber-terrorists.**

Customer satisfaction

73. The Commission relies on the metrics of SAIDI and SAIFI as the measure of service quality. The assumption behind using these metrics is the inference that reliability is the aspect of quality customers value the most. However, we see merit in the Commission moving away from SAIDI/SAIFI metrics as the measure of service quality given they bear very little relevance to the actual customer experience.

74. The Commission should consider metrics such as customer satisfaction to directly understand whether customers value the service by their EDB. Indeed, this will enable the Commission to develop an insight as to whether an EDB is meeting the evolving expectations of their customers. The benefit of a customer satisfaction metric is that it does not rely on inferences about customer preferences. The United Kingdom regulator Ofgem is already implementing similar types of customer satisfaction metrics in their quality of service metrics with financial incentives.¹⁴ We also support a metric measuring the customer engagement initiatives undertaken by the EDB. This will encourage more formal engagement with customers in the asset management strategies developed by the EDB.
75. The Commission should investigate the reasonableness of other customer orientated metrics such as response time information, customer connection times and possibly a distribution across an EDBs customer base of outage performance.
- 76. We recommend the Commission replace its reliance on the quality metrics SAIDI and SAIFI with measures that are more meaningful of the customer experience and consider the benefit of directly measuring customer satisfaction.**

Climate change and sustainability

77. The key sustainability challenge and opportunity for the energy sector is climate change – through both the drive to decarbonise and the risks from physical impacts of climate change.
78. We believe Part 4 has a role to play in encouraging sustainable business practices including carbon mitigation and adaptation measures. Indeed, this role has been explicitly recognised by overseas economic regulators such as Ofgem. Climate risk is becoming firmly entrenched in financial thinking, with the Financial Services Board (FSB) recognising that climate change poses significant financial challenges now and into the future, as part of the FSB's work on climate-related financial disclosures.¹⁵
79. The impact of climate change on economic activity will increasingly become pronounced. Recently ratings agency Moody's indicated it will assess credit issuances by states and municipalities in the United States accounting for the climate related risk exposure for the

¹⁴Ofgem, *Strategy Decision for the RIIO-ED1 electricity distribution price control: outputs, incentives and innovation* (4 March 2013) p, 62-63

¹⁵Financial Services Board, *Recommendations of the Taskforce on Climate-Related Financial Disclosures* (June 2017), p 5

region.¹⁶ This risk transpires in a physical sense with analysis of weather variables such as wind, temperature and drought as well as sea level rise expected to have an impact on energy assets. Accordingly, one way or another the customer will invariably be bearing the cost of climate change.

80. The most efficient means of addressing climate related impacts on business is by understanding the nature of the risk and commencing the transition to a low emissions economy and adaptation. A less engaged approach by the commercial sector to climate change impacts will ultimately impose more costs for adaptation for consumers. Accordingly, explicitly allowing for climate change and sustainability initiatives within the Part 4 recognises climate change and sustainability are efficient costs expected to be incurred by businesses operating in competitive markets and consistent with the long-term benefit of consumers.

81. We recommend the Commission explicitly recognise climate change and sustainability expenditures within Part 4 given these are expected to be costs incurred by businesses operating in competitive markets and are in the long-term benefit of consumers.

Conclusion

82. We look forward to engaging with the Commission as it progresses its priorities for the 2018 year and begins its engagement on the resetting of the 2020 DPP. We hope the Commission takes the opportunity to articulate its vision for the long-term benefit of consumers and ensure the 2020 DPP reset includes improvements to further the vision. If you have any questions in relation to this submission, please contact Richard Sharp at Richard.Sharp@vector.co.nz or on 09 978 7547.

Yours sincerely
For and on behalf of Vector Ltd

A handwritten signature in blue ink, appearing to read "Richard Sharp", with a large, stylized flourish at the end.

Richard Sharp
Head of Regulation and Pricing

¹⁶ Moody's Investor Service, *Announcement: Climate change is forecast to heighten US exposure to economic loss placing short and long-term credit pressure on US states and local governments* (28 November 2017) available: https://www.moodys.com/research/Moodys-Climate-change-is-forecast-to-heighten-US-exposure-to--PR_376056

