14 June 2024

Finance and Expenditure Committee
By email: fe@parliament.govt.nz

Vector welcomes this opportunity to submit on the Finance and Expenditure Committee's inquiry into climate adaptation.

Vector is an innovative New Zealand energy company, which runs a portfolio of businesses delivering energy and communication services to more than 600,000 residential and commercial customers across New Zealand. We are New Zealand's largest distributor of electricity and gas, owning and operating networks across the greater Auckland area which span over 25,000km in length,[1] which is more than the distance from Auckland to London. We operate our assets and infrastructure with a strong focus on the increasing impacts of climate change and severe weather events. Our electricity network is already 99.98% reliable[2] and we invest tens of millions of dollars every year on maintenance and improvement programmes to keep it that way.

The impacts of climate change are already being seen in New Zealand. Vector spends $15.8 million annually on service interruptions and emergencies, most of which is attributed to weather. Significant events add additional costs to this, such as those of Cyclone Gabrielle and the Auckland Anniversary floods of 2023 which cost an extra $15.6 million. While this is significant for Vector and our customers, we note Treasury's estimate of the total damage cost of the Auckland Anniversary floods and Cyclone Gabrielle to be between $9–14.5 billion.

In respect of the entire electricity value chain, we also note that dry year risk still exists in the face of the intermittency of renewable generation which is likely to be exacerbated by the impacts of climate change.

Vector supports the need to address climate adaptation and emphasises to the Committee the importance of industry being involved in any decision-making given the implications on our ability to deliver our critical services to Auckland and New Zealand. We require certainty for our long-term planning for our assets and infrastructure and their future operation. Critical to regulated infrastructure in particular is the regulatory regime administered by the Commerce Commission which oversees and approves investment and expenditure of electricity and gas distributors. Of key and growing importance within the regulatory regime is the issue of funding as typically the regulatory model back-ends cashflow to the end of the asset life which places increasing pressure on the financeability of ongoing investment which may not be matched with increased revenue in the short to medium term.

[1] 2000km of fibre, 4500km gas pipelines, 19,000km of electricity lines

[2] Based on our System Average Interruption Duration Index (SAIDI) reliability

If you have any questions regarding this submission or would like further information on any of the points we have raised, please contact our Group Manager Public Policy and Government Relations Aimee Gulliver.

We would welcome the opportunity to discuss with the Committee what we see as challenges and opportunities in the climate adaptation space and to work with officials on these complex but critical issues.

Mark Toner
Chief Public Policy and Regulatory Officer

1. Vector's approach to climate change

Vector continues to advance its investment and understanding of climate change analysis. We produce a report from our Taskforce on Climate Related Financial Disclosures which addresses our aim to enable decarbonisation while at the same time delivering safe, reliable and affordable energy solutions for customers.[3]

We also annually produce and publish 10-year Asset Management Plans[4] which identify climate change adaptation analysis we have undertaken and explain how we will seek to address emerging climate risks to best maintain services to our customers.

By way of example, in 2022 Vector undertook advanced flood depth modelling at critical assets which analysed flood depth projections through to 2100 based on three IPCC AR6 scenarios. Of Vector's 119 zone substations (which play a crucial role in our networks as an intermediate point between high voltage transmission substations and low voltage distribution networks), eight were identified to be at potential risk of flooding and a further 12 will be monitored for future potential risk.

We have also analysed the impact on our assets from predicted increase in high wind speeds through to 2100, current fire risk, and landslip susceptibility – all at an increasingly granular geo-spatial level. Our preliminary analysis across Vector's 180,000 power poles has identified and categorised poles in respect of landslip risk zones which then allows us to prioritise future inspections and proactive investment. We will continue to harness data and work with external parties such as NIWA and the University of Auckland to continue to refine our analysis of climate adaptation risks.

Our approach in addressing this risk is based on the International Energy Association's conceptual framework for climate resilience detailed in Figure 1 below. It breaks climate resilience into three categories: robustness, resourcefulness, and recovery. We would encourage the Committee to adopt such a framework in considering climate resilience on critical infrastructure.

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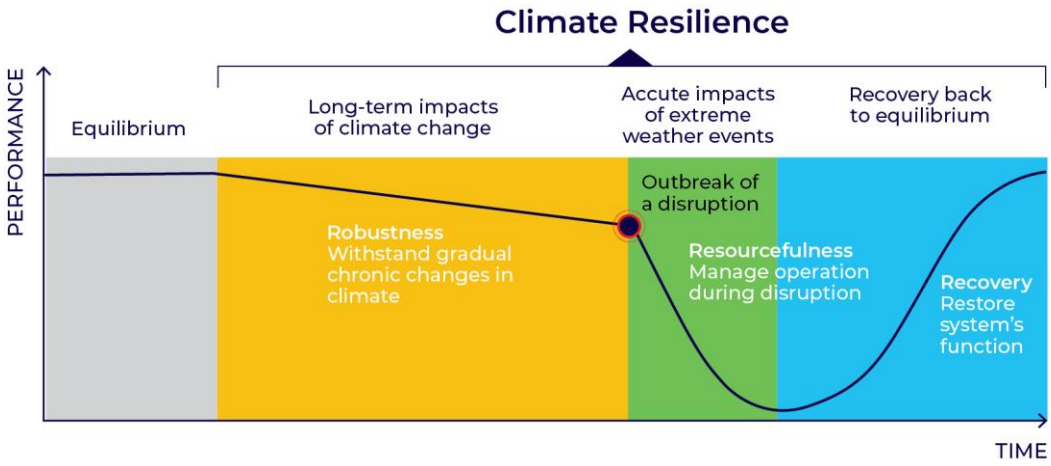
[3] vector-2023-tcfd-report.pdf

[4] blob-static.vector.co.nz/blob/vector/media/vector-2024/electricity-asset-management-plan-2024-combined-final-updated.pdf



Robustness relates to the ability of the infrastructure to withstand the impacts of climate change. Examples of our strategies involve:

- Flood hardening at zone substations – such as raising floor levels or building flood barriers;
- Decommissioning high risk assets and transferring loads to different locations;
- Building additional cables such as our third sub-transmission cable to Waiheke Island;
- Meshing the electricity network to allow for greater diversity through back-feeding power;
- Hardening the network to reduce the risk of wildfires;
- Vegetation management to reduce impacts of treefall on lines; and
- Building microgrids so the low voltage network can continue to operate when upstream failure occurs.

Resourcefulness is the business effectively continuing our operations to customers during immediate shock events. Examples of our strategies involve:

- Procuring a mobile substation which can be deployed in an outage;
- Investing in communication channels and digital platforms for our customers during outages; and
- Maintaining an effective emergency response plan, which includes monitoring potential weather events, proactive deployment and prioritisation of field resources.

Recovery is the ability to restore the function of the network after an incident. Examples of actions taken include:

- Effective management of equipment stock to ensure the availability of spares; and
- Management of full-time and temporary resources, including utilising out of region resources during extended recovery periods.

2. A fair approach to climate adaptation

Our modelling indicates it would cost approximately $1.37 billion to mitigate known major climate change related risks from our electricity network assuming today's regulatory standards (such as outdated tree-trimming regulations). Of course, to embark on such investment would be conditional on our economic regulator, the Commerce Commission, accepting that such a future investment is appropriate and funding our revenues to enable such investment. The consumer burden is not insignificant; as an approximate indication, this level of investment would impose upon Vector's

610,000 electricity customers a cost of approximately $2250 per household and as such is not a future investment that can be undertaken lightly.

We do not propose and therefore have not included this potential expenditure in our current Asset Management Plan because we do not consider that customers should fund these investments when changes - in particular, where Government policy could materially change the approach to resilience and adaptation. For example, the electricity industry has long advocated for substantive improvements to tree-trimming regulations that could materially reduce such a cost. For the next 10-year period we have proposed investing approximately $200 million in assets and maintenance that will improve network resilience to climate change while we await meaningful change to tree-trimming regulations (see below).

As an infrastructure owner our goal is to strike a balance between network reliability and affordability. A survey conducted in 2020 among Vector residential customers noted those willing to pay for fewer or shorter electricity outages during climatic events was very low (circa 20 per cent).

3. Fairer adaptation through regulatory improvement

Elements of New Zealand's regulatory frameworks are no longer fit for purpose considering the impacts of climate change. One very clear example of this is the Electricity (Hazards from Trees) Regulations 2003.

Vegetation strikes and damage are one of the most common causes of outages on Vector's network and with the changes in climate and increasing severe weather events this is becoming more prevalent. In extreme weather events up to 70 per cent of outages on our network are caused by vegetation. To manage the impact of vegetation, Vector utilises a risk-based approach to plan and then carry out remediation work.

Our current forecast is that without substantive regulatory reform, tree management would cost Vector and our customers $196 million in the period 2026 – 2030. If tree regulations were adequately reformed, it is estimated we could achieve similar outcomes for just $59 million.

Vector continues to advocate for meaningful changes to tree regulations which have a direct influence on the efficacy of our vegetation management practices and therefore vegetation related outages. Recently announced measures in this area are a step in the right direction but wholly insufficient. We urge further substantive changes to ensure the resilience of our network in severe weather events.[5]

4. Customer driven adaptation for improved efficiency

The use of non-traditional solutions such as distributed energy resources (DER) or micro-grids in electricity networks are also likely to play a key future role in improving system security and resilience for customers. DER can reduce the reliance of communities on a single point of network failure in a climatic event, providing alternative sources of energy in an outage. This can reduce

[5] As recommended by the Government Inquiry into the Response to the North Island Severe Weather Events

the risk of a community being 'cut off' from power supply, even when the grid or network has been compromised.

However, the criteria for a regulated network to invest in distributed generation have already proven to be a barrier for networks across New Zealand. This is at odds with the goal of increasing investment in localised renewable generation, which could play a role in driving greater resilience. Distribution generation, and DER more broadly, presents an opportunity to reduce avoidable outages by strengthening system security. For example, EVs connected to the network could act as sources of energy and help stabilise the system in a grid emergency.

The U.S. state of Florida provides a case study of where a broader understanding of resilience and the role of non-traditional or distributed solutions served community resilience well in an emergency. In 2022 Hurricane Ian resulted in outages for millions of customers in the state. However, microgrids (distributed generation systems) ensured continued access to electricity in at least three residential communities, retail establishments, medical facilities, a university, and manufacturing operations across the affected states of Florida, Georgia, Virginia and the Carolinas.

As an example on Vector's network, Kawau Island is highly exposed to the impacts of climate change due to its geographical topology and coastal exposure. Repairs to its 312 electricity connections come at considerable cost due to the need to helicopter supplies to the island. Providing solar battery solutions to Kawau Island's inhabitants and decommissioning the local electricity network rather than continuing ongoing maintenance could become both more economically efficient and provide a more resilient electricity supply to customers. Such a project would require significant coordination between government, regulators, network operators and customers to establish a model conducive with the regulatory constraints. If successful, such a pilot could be expanded to other high-risk, high-cost exposure areas - particularly for communities at the "edge" of an electricity network and therefore be exposed to single points of failures.

5. Resilience planning for de-growth assets

As a gas infrastructure company, Vector and its connected consumers are currently exposed to transition costs, disruption, and gas-asset stranding risk. This is largely driven through uncertainty over the future of gas infrastructure, and lack of clear policy direction to adequately manage this transition.

Scenario analysis indicates that under current regulatory and policy settings the extent of network stranding across New Zealand could be significant assuming a 2050 stranding date scenario with no further regulatory or policy mitigations. Regulatory failure leading to asset stranding could undermine the principle of financial capital maintenance and therefore the incentives to invest in long-lived infrastructure which are traditionally underpinned within the economic regulatory model by a confidence in full cost recovery (i.e., that costs incurred over the lifetime of an asset will be recovered by tariffs paid by users of these investments over the same lifetime).

A high degree of uncertainty over the use of gas infrastructure becomes problematic for future investments such as repair after a natural disaster. Even today, directors of pipeline-owning companies could be severely challenged in their ability to approve reinstating gas infrastructure

pipelines if they do not have confidence that the cost of such investments will be recovered under the regulatory model.

A further significant cost imposition of any future fossil gas transition is the impact on current users of reticulated gas. Analysis completed by the Gas Infrastructure Futures Working Group revealed the cost to consumers for appliance/asset switch-out costs in the event of forced consumer exit off reticulated gas could be as high as $7.9 billion.

New Zealand infrastructure investors will need policies able to provide wider sector regulatory coherence and investment confidence allowing the country to manage the transition. Gas asset stranding undermining financial capital maintenance would risk an impediment to investments in other regulated businesses such as electricity networks – a serious concern when such substantial infrastructure investments are required to drive electrification. Policies that preserve the principle of financial capital maintenance not only serve to mitigate regulated infrastructure owners from stranded assets, but also protect future consumers from forced appliance switch out costs as well as substantial price increases.

The Government can leverage these co-benefits to protect consumers and infrastructure owners simultaneously. In November 2023 Vector drafted a paper to Government presenting potential pathways for a manged gas transition, which requires clear policy direction to drive certainty, regulatory intervention to accelerate and preserve cost recovery, and risk-abating commercial decisions from gas infrastructure businesses.[6]

[6] https://blob-static.vector.co.nz/blob/vector/media/vector-2024/vector-2023-managing-the-gas-transition.pdf