

8 August 2023

National Security Group
Department of the Prime Minister and Cabinet
Level 8 Executive Wing, Parliament Buildings
Wellington 6011

Via email: infrastructureresilience@dpmc.govt.nz

Tēnā koutou,

Target reform to improve infrastructure resilience for communities

Powerco is a critical infrastructure provider and investing for a resilient network is a core part of our business. Powerco is one of Aotearoa's largest gas and electricity distributors, supplying around 344,000 (electricity) and 113,000 (gas) urban and rural homes and businesses in the North Island. These energy networks provide essential services and will be core to Aotearoa New Zealand achieving a net-zero economy in 2050.

Societal resilience across the infrastructure system does demand increased attention and we support the government review of options to enhance this. Reform will be complex due to the many drivers, trends, responses, and linkages to other objectives. We have commented on key topics and questions in the discussion document in Attachment 1 and provided additional information about Powerco in Attachment 2. Our summary views are:

Reform objectives should link resilience and communities

- The work programme must link community needs with the resilience of Aotearoa New Zealand's critical infrastructure system. Infrastructure providers are well-placed to understand links between community vulnerabilities, needs, and investment options
- In looking at reform, we need to understand the value of resilience for communities and Aotearoa New Zealand, but this is not apparent in the discussion document
- Increasing interdependencies between infrastructure providers requires community level planning, rather than by an individual sector or provider
- The financial consequences, policy considerations, and regulatory implications are complex. The reform needs to connect to multiple related reforms and focus on lifting the floor and improving existing frameworks, not creating new ones.

Information sharing and standards for coordination

- Coordination, transparency and consistency in infrastructure resilience could be improved. Streamlined information sharing and reporting are key areas to look at
- New standards could be appropriate but would require considerable scoping and consultation to ensure they are targeted and effective – a ‘one size fits all’ approach is likely to deliver a ‘one size fits none’ outcome
- National security risks should be managed alongside, rather than separately to, all risks. Non-regulatory options would assist
- Focus on targeted responses that will make a real difference for resilience, and build on systems and processes already in place

If you have any questions regarding this submission or would like to talk further on the points we have raised, please contact Irene Clarke (Irene.Clarke@powerco.co.nz).

Nāku noa, nā,



Andrew Kerr
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POWERCO

Attachment 1 – Response to discussion document

1 Summary of Powerco responses

Discussion document topic / question	Powerco response
A work programme to improve resilience	Coordination, transparency, responsiveness, and consistency in infrastructure resilience could be improved. This should focus on lifting the floor and improving existing frameworks, not creating new ones . The objective of this work programme should be to enhance the resilience of New Zealand’s critical infrastructure system to relevant hazards and threats to a level that meets community needs
Assessing financial consequences	Increasing resilience will have financial consequences and is complex to assess. It is important to understand the value of resilience to communities and measure this in a meaningful way . The default regulatory position, is that customers pay for increased investment in resilience of our electricity and gas networks – exploring funding alternatives at a national level may have merit.
Megatrends	We agree with the four mega trends identified and have also outlined additional key trends and drivers. Both uncertainty and the pace of change are shaping our infrastructure system. There is a link between decarbonisation policy, emissions reduction targets and resilience which needs fuller consideration .
Link to regulation	Any new regulation will need to align with existing regulation (and other reforms) where possible. Even more importantly, to enhance resilience while minimising costs, a number of existing regulations will need to be amended to facilitate this.
Understanding of issues	There is opportunity for improvement in sharing of information on hazards/risks/dependencies, and consistent use of data, scenarios and mapping . The creation of a new secure platform is not a priority, rather the focus should be on enhancing existing mechanisms and accelerating the information portals already in development .
Minimum standards vs community needs	We support the concept of minimum resilience standards to lift performance, so long as there is considerable scoping and consultation to ensure standards are appropriate . Standards, including to define criticality, could be a tool for planning options with customers, but should not direct where capital expenditure goes (which all customers will pay for). It will be essential to recognise that appropriate resilience levels will vary across the country and even within network areas. Infrastructure providers are well placed to understand community vulnerabilities, needs, and investment options .
Powers to manage national security risks	Infrastructure providers should manage national security risks alongside, rather than separately to, all risks . Any move to direct management of national security risks should be a last resort. We encourage the government to continue to support non-regulatory measures such as briefings, alerts, and sharing information or reporting about risks and protections.
Government oversight and reporting	A new government agency is likely to increase complexity rather than improve infrastructure resilience . The focus should be on getting the resilience requirements right, rather than agency arrangements. We strongly recommend aligning and streamlining reporting requirements and forms, not creating new reporting . The XRB standards could be the base for this.
Fuel diversity for resilience	Achieving a resilient, low-carbon, affordable energy system is ambitious and needs a smooth transition. The reliability and fuel diversity benefits of natural gas, and future low-carbon gas, has significant resilience value alongside the other characteristics of an essential service. We endorse a systems approach to strengthening resilience that recognises the value and interdependencies of fuel diversity for resilience .

2 Objectives and principles of potential reform

2.1 More could be done to improve resilience

More could be done to improve coordination, transparency, responsiveness, and consistency in infrastructure resilience. We endorse a holistic approach to resilience in the infrastructure system, rather than individual sectors or entities or assets.¹ If the approach to resilience is to change, we foresee considerable difficulty in defining the 'socially-optimal' level of resilience and funding this at the right cost for society. The discussion document acknowledges the tension between resilience, affordability and a number of other drivers and objectives. It does however, seem to assume that more investment in traditional infrastructure solutions is required. The process for developing and delivering reform will need to be an engaged and considered one involving government, infrastructure providers and communities.

Powerco already has significant systems in place to manage infrastructure investment including for resilience, to set performance targets for outages², and for responding to events or failures. Policy effort is best directed at improving existing frameworks³, rather than creating new ones, and improving community understanding of targets and planned responses.

In our view, key areas for attention are common understanding of what is meant by and how to measure 'resilience', 'adverse event' 'emergency response' and other terminology; consistent access to and use of data for the shocks and stresses infrastructure providers are planning for; streamlining processes and reporting, and connection with communities in understanding and planning for local resilience. We agree that the priority is 'lifting the floor' and a focus on improved alignment between entities (those currently regulated and those not regulated). We also agree with the principle that outcomes of this work should apply to all critical infrastructure providers, irrespective of ownership.

2.2 The objective of the work programme should focus on enhancing the resilience of New Zealand's critical infrastructure system to relevant hazards and threats to meet community needs

The objective of the work programme as stated in the discussion document is too broad, untargeted and, in our view, unachievable. The objective of this work programme should be *to enhance the resilience of New Zealand's critical infrastructure system to relevant hazards and threats to meet community needs*.

¹ For example, current environmental regulation provides national direction to enable some critical infrastructure but not other interdependent infrastructure. Even within the energy sector, there is not a holistic approach to national direction for generation, transmission and distribution.

² Regulated SAIDI and SAIFI allowances and the proposed PELOS under EM Bill all set types of targets, however a SAIDI target or result is not necessarily meaningful for a customer or community in their own resilience planning and there is an opportunity to think differently in terms of resilience.

³ For example, the responsiveness of the DPP system for electricity and gas distributors could be improved to be more flexible to changes in investment priorities related to resilience or response to shocks and stresses.

There will be a broad range of types/severity of 'hazards' and 'threats' which will differ both geographically and by infrastructure provider. It is unlikely and unnecessary for a system to protect against all hazards and threats. Attempting to achieve resilience against all hazards and threats will likely achieve none. Expectations for how resilience planning is approached could be clearer with an expectation that infrastructure providers are aware of **relevant and probable risks** and have planned mitigations to minimise the risk of failure or the impact of damage during and after major events, and the timely restoration of services.

The system needs to be dynamic and responsive in minimising impacts of relevant hazards and threats. Informing customers about the fail-safe or fail-stable state expected in identified scenarios, or the level of service anticipated in identified scenarios, will enable communities to plan for their own responsibilities in resilience.

Infrastructure has an essential role in New Zealand's wellbeing and growth and enhancing infrastructure resilience will support this. However, if the objective of the work programme is to 'protect' wellbeing and support 'sustainable and inclusive' growth, more clarity will be needed about what this means in practice, and how it would be tested and measured through the work programme. For example, it could be interpreted as reducing energy outages, or spending more in vulnerable communities for inclusive growth (whether needed or not), or not spending in remote areas for sustainability reasons.

The work programme objective should focus on enhancing resilience of the system to meet community needs. A key element of resilience is understanding community needs (including their self-resilience capability), and engaging and planning with communities around this.

We support the secondary objectives of the work programme to improve the dynamism and flexibility to changes in the regulatory system, covering both natural and man-made risks (particularly cyber), seeking alignment across infrastructure regulatory regimes (including market regulation, resource management, emergency management, climate change), and generally improving awareness of both hazards and planned responses.

2.3 Reform may result in both streamlining and regulatory burden

Regulatory burden and complexity for infrastructure providers should be important considerations and also affect costs for consumers and government. Assessment of costs/barriers should consider both infrastructure providers and customers, and the cost structures (which vary across sectors) for how costs are apportioned. An increase in regulatory burden or complexity could be positive or negative and we are open to a change or increase if it improves performance of the infrastructure system for our customers. We also see opportunity for this review to streamline regulation. We support the intent for targeted and proportionate tools and caution against jumping to more comprehensive reform based on international examples, which may not fit our local context.

3 Context and drivers for infrastructure resilience

3.1 A range of megatrends are shaping our infrastructure system

We agree with the four mega trends identified – climate change, geopolitical and national security, economic fragmentation, and new technologies – and note that these factors are all integrated into our planning, investment and asset management. These trends are not only risks, but can also offer resilience opportunities, for example new technologies enhance visibility of potential or actual outages and enable new types of remote response.

The **pace of change** is significant and **uncertainty** in our infrastructure system and regulatory framework is a megatrend itself. Other significant trends to highlight include:

- Increasing reliance on electricity for energy supply and heightened reliability expectations as NZ electrifies, eg as an enabler of electric transportation, data, remote working, and converting large-scale industrial processing to electricity
- Increasing opportunity for (and presence of) local energy solutions, distributed generation, and decentralisation of national infrastructure systems
- Increasing dependency between infrastructures eg fibre and mobile communications require electricity along the network, as do consumers at their point of use
- Changing workforce requirements, availability, education and the future types of work
- The ‘movement against meat’ potentially resulting in population change and land use change
- Changing scope and availability of insurance funding
- Policy uncertainty impacting infrastructure investment⁴.

The climate change megatrend outlined in the discussion document notes that decarbonisation will have implications for infrastructure, including the electricity system and changes in demand. After decades of steady or little growth, scenario forecasts suggest demand will increase substantially over the next 20-30 years⁵ – the implications are significant.

While there will likely be overlap in solutions, there can be tension between decarbonisation and resilience:

- Improving resilience could **increase rather than decrease emissions**, including through fuel options and construction needs. For example use of diesel generators for resilience in some remote locations could have a lower embedded carbon cost than building/upgrading lines. The link between fuel options and resilience is a specific case we have discussed in section 4.7.
- The **resourcing and pace of build required** to meet future electrification needs may not be possible alongside also improving resilience of our overall infrastructure system to the preferred state. The government needs to consider competing priorities in the context that New Zealand is unlikely to have the capacity to build the energy infrastructure required for decarbonisation, at the pace required to meet climate change targets, while also improving resilience.

⁴ For example uncertainty in the future of gas which offers important resilience in our energy system.

⁵ See for example <https://www.bcg.com/publications/2022/climate-change-in-new-zealand> which has scenarios with 2050 demand being 70 % higher than today. Peak demand is expected to almost double (page 47).

- Efficient decarbonisation through electrification would broadly imply increasing electricity demand, ideally while maximizing asset utilisation (minimising unit costs). On the other hand, resilience could focus on maintaining minimum viable supply levels during or following an event, often through providing redundant assets. This **tension between resilience and efficiency** could lead to contradicting solutions.

Many regulatory reforms are underway in response to megatrends. The link between this reform and other reforms as well as existing settings must be acknowledged and accounted for.

3.2 There are financial consequences of enhancing resilience

We agree that regulated entities are generally performing well and investing in assets for long term benefit. Recent Commerce Commission analyses for electricity and gas distribution networks support this from an economic and asset management perspective.⁶ The priority should be as stated – to ‘lift the floor’ and learn from the sectors and entities that are performing well.

It is our view that resilience related to known hazards and threats are already accounted for in our standard network planning and reliability approach. For example, physical network strength, design and safety standards, capacity and redundancy are already integral parts of our network planning and investment. Powerco is subject to price-quality regulation which strikes the balance between cost and delivery. This regulation broadly means that customers on a network will pay for improvements in resilience on that network. Further enhancing resilience of our assets and services is expected to be an incremental change rather than significant financial consequence.

The principle that the costs of enhancing resilience should, where possible, be paid by those who benefit, will be difficult to apply equitably, and we would encourage robust analysis of this giving consideration to:

- What is the **value of resilience** to a community, and can we measure this in a meaningful way to enable prioritisation of expenditure?
- If works are being done to a higher standard than the accepted minimum, who decides if this is appropriate and how do we avoid over-building to achieve affordability and inclusiveness?
- Should a minimum standard of service be expected and paid for (cross subsidised) across all customers for geographical equity?
- How do we assess the value of increased resilience to the government, and allocate appropriate central funding for those services of national significance?
- Should communities subject to hazards where risks and network standards are better understood (eg earthquake risk) be subject to higher costs compared to areas where hazards or responses are less standardised (eg flood risk)?

Understanding the value of resilience to a community or to New Zealand is a key component of this reform debate and needs much stronger attention as options are progressed. It will be important for the outcomes of this review to link investment in resilience to actual community need and ability/willingness to pay to achieve this.

⁶ <https://comcom.govt.nz/regulated-industries/electricity-lines/electricity-distributor-performance-and-data/trends-in-local-lines-company-performance>

Increasing risks on more challenging parts of the network or areas with small numbers of customers may require a new approach or a step change in investment. We are already talking to some small communities about options such as local community hubs, where we would build additional resilience across a range of services and which communities could access during extreme events. This could be much more cost effective and affordable than investing in wholesale resilience improvements. We expect other parts of New Zealand will face similar trade-offs.

We support the intent for government to **minimise the consequences of cost increases**. For the energy sector, there is a significant workstream on energy wellbeing/affordability, led by Ministry for Business, Innovation and Employment. One aspect of our input has been to endorse government taking the lead in a national approach for support mechanisms, rather than this being a role for infrastructure providers. From a network perspective, there are some regions or locations which are more vulnerable to shocks and stresses or where the cost of maintaining resilience would be much higher than the norm. We can help with information about this, though other parties will be better placed eg retailers of energy and telecommunications services, social agencies. We encourage government consideration of vulnerability, and responses, to go beyond individual New Zealanders and consider where there are locations or groupings of customers that may be more vulnerable.

3.3 This reform will need to look at a number of existing regulations and other reforms

As outlined in the discussion document, there is a link to the reform underway of the Civil Defence Emergency Management Act and the new Emergency Management Bill. While the Emergency Management Bill has a narrower scope than this potential resilience reform, there appears an important opportunity to expand the scope of that Bill (through amendment) rather than introducing another law in the long list of Acts which already create conflicts, confusion and uncertainty in infrastructure planning and investment.

The discussion document mentions some other relevant regulatory regimes such as resource management and climate change response which this reform will need to align. There are many more regulatory areas which are relevant and will need to be considered in their intersection with this reform, including market regulation (eg Electricity Act and Gas Act), secondary regulation/strategy (eg Input Methodologies, price-quality path reviews, ETS, Emissions Reduction Plan, and pending Gas Transition Plan and Energy Strategy) or influencing costs or ability to support resilience (eg RMA National Policy Statements, tree hazard regulations).

It will not be a matter of merely aligning this new reform with existing regulation. Rather, if the government and communities are looking for enhancement of resilience while minimising costs, a number of other Acts/regulations or reviews will need amendment to facilitate this and **embed resilience outcomes into existing regulation**. The tensions between resilience vs other regulatory outcomes needs transparency. For example, a network may not be able to ensure resilience when located within an area of significant natural importance, due to the restrictive environmental regulation. As another example, gas networks and bottled gas provide proven resilience in times of emergency, yet emissions reduction policy will potentially remove this existing option.

The extent of this reform could grow quickly, and we again emphasise our support for targeted and proportionate tools fit to the local context.

4 Barriers and responses

We have responded to six barriers outlined in the discussion document below, followed by comments on barriers in future fuel diversity at the end of this section.

4.1 Improving shared understanding of issues for efficiency and consistency

There is significant opportunity for improvement in sharing of information on hazards, risks and responses. Infrastructure providers are assessing hazards and risks based on their own approach to defining risks and independently obtaining hazard and risk information. An agreed source of information will provide significant efficiency for infrastructure providers, as well as the opportunity to improve management of critical interdependencies (currently hazards and assets are generally managed independently)⁷.

Opportunities for improved sharing of information include:

- Consistent use of hazard information and scenarios across a region, across a sector nationally or multiple infrastructure sectors. For example, consistent use of the same flood hazard scenario and data for the purpose of risk assessment and asset resilience
- Availability of climate data for all infrastructure providers in a form that can be easily integrated into data systems, rather than each building their own data set. For example file types easy to add to GIS systems
- One accessible mapping platform containing hazard and asset information that can be used by councils, infrastructure providers and customers. For example rather than separate platforms for flood mapping and critical assets, visibility of all information in one place, including in district plan processes. A standard data format would assist transferring and integrating between councils and infrastructure providers
- Forums to encourage information sharing including strategies and capabilities in cybersecurity threat identification and responses
- Coordination of knowledge and planning for dependencies between local infrastructure providers
- Appropriate sharing of customer data to understand community stress points and communicate with customers smoothly at certain times
- Improved methods of sharing of information on location and status of essential services in emergency situations, such as wastewater facilities, hospitals and rest homes. For example a form for all infrastructure providers to have the same information on the status of criticality, degrees of self-resilience and short or longer term resilience needs.

We are increasingly reliant on electronic data and mapping. Powerco has put considerable effort into obtaining data sets from the six regional and twenty-nine territorial authorities across which we operate. Not only is there room for efficiency in this task, but improved coordination and sharing would assist with the current technical capability risk in the growing resource and skill required across numerous organisations in GIS and data analysis.

⁷ For example, a council managed stop bank may have a design rating which provides protection for adjacent electricity assets for a 2% AEP flood. The council may not be aware of the criticality of the assets in the flood risk area when they assess the need to upgrade that level of flood protection, and the electricity distributor may not be aware of the council's funding priorities in order to look at other asset options for that location.

The National Adaptation Plan has an action to create risk and resilience and climate adaptation information portals, recognising the value in one authoritative source of information. Action 3.2 of the Plan identified Toka Tū Ake EQC will be delivering the first phase of the risk and resilience portal by the end of 2022, and MfE will design a scope, user needs and have a delivery plan for the adaptation information portal by the end of 2023.

In our view the creation and administration of a secure platform for sharing information is not a priority. Mechanisms for sharing sensitive information between infrastructure providers and government are already available. If infrastructure providers supply details of major security incidents, the government can de-sensitise and share this information for the broader industry without needing a new secure platform. Improving the sharing of cyber security information is about the approach of people and the culture for sharing information and learning from it, not about having a platform to do so. Rather than developing another portal, we encourage the government to focus on the portals in development to share hazard and risk data and encouraging more sharing of cyber information using existing mechanisms and forum.

4.2 Targeting standards to lift performance

Powerco operates in line with a number of recognised standards or regulated performance targets. We support minimum resilience expectations for the infrastructure system to lift performance, as long as any standards reflect different regions and expectations of communities. This requires considerable scoping and consultation so any standards are linked to what customers want, are targeted in the areas that will actually make a difference across the system, and are not forcing unnecessary spend. For example, there may be limited options to improve resilience for a small community at the end of a long low-voltage line in a flood prone valley, so customer owned electricity generation or EDB owned temporary generation or alternative energy (eg gas) following a flood may be a better alternative. In that case, a standard that required the asset to be hardened above 1% AEP may be very costly for no benefit over alternative options.

Agreeing on what good practice is in infrastructure resilience will be challenging and should be the first step before considering standards. This will help avoid an outcome where considerable effort in developing and implementing a standard does not actually improve resilience.

Individual infrastructure providers are best placed to understand their customers, their networks, and what good resilience looks like in their situation. Care will be needed that standards do not undermine this, or force investment when not actually needed or wanted by customers, or where more efficient options are available.

Process standards could assist to align regulated sectors and unregulated sectors in consistent process, for example adopting the ISO risk management process or a form of the resilience management maturity assessment⁸ undertaken by EDBs. Providing a common framework or approach could provide improvements and transparency while enabling individual sectors or infrastructure providers to apply the approach at a local level.

⁸ Electricity Engineers Association Resilience Guide 2022

Principle standards could align understanding of infrastructure providers' investment in resilience, similar to the regulated endorsement of electricity and gas distributors' forecasting and approach to timing/spread of spend on assets. Applying principles across a broader range of infrastructure providers would assist where there are critical interdependencies, for example between electricity distributors and IT service providers.

Electricity Networks Aotearoa, in conjunction with Transpower, has commenced a project to provide a common resilience definition and a set of agreed minimum expectations that would apply across the electricity transmission and distribution industry. This work will be valuable input to any broader resilience strategy.

Possible areas for considering direction for consistency in practice include:

- Directing a consistent approach to hazard and risk information, source, use, and/or mapping, as discussed in section 4.1. This could include direction on which hazard scenarios to use in each region (which would differ by region) and mapping dependencies or criticality
- Setting definitions for example for 'hazards' to be addressed in network resilience vs scale of 'event' to be addressed as emergencies
- A framework for more consistent framing of hazards across hazard type (eg applying seismic/wind loading band approach to other hazard risk such as landslip)
- Reporting standards to streamline and clarify multiple reporting expectations. This should not be a new reporting standard, but rather clarifying that use of the XRB reporting is the baseline
- Consistent design solutions where this may enable more consistent use of equipment or assets and sharing of resources across infrastructure providers. For example standardisation of widely used equipment between electricity distribution companies would allow sharing of resources during extreme events or maintaining a centralised critical spares inventory
- Expectations of new consumer devices in resilience, for example the battery life in phones or electric vehicles, or back up capacity for a fridge.

If resilience standards increase the investment required in infrastructure, then the financial consequences and who pays will need to be fully assessed. Any standards must strive to keep processes as efficient and simple as possible.

4.3 Defining criticality for a more resilient system

Powerco already has processes to prioritise investment, for example to assess the criticality of assets, risks and where asset renewals are more urgent. However traditional reliability cost-benefit tools are not necessarily fit for purpose with a resilience lens. There is scope for the government to invest in a model which more broadly defines criticality in terms of resilience for a consistent approach across infrastructure sectors, but more importantly, to improve how criticality is assessed between dependant infrastructures. We encourage any work in this area to focus on actual gaps rather than duplicate existing tools.

There are some examples to draw on where a model has been developed (eg New South Wales), however there will be particular value in developing a model where this assesses the consequence/ likelihood for interdependent infrastructures rather than separate criteria by infrastructure type. Mapping critical dependencies and locations

would be beneficial and we know some regional lifeline groups do this already. In general, regional coordination is most important in identifying criticality, key stakeholders, information links, and planning for resilience.

Many customers or communities already have their own planned response to enhance resilience or are working towards this with support from infrastructure providers. Mechanisms to understand, for example, where an industrial customer has their own 48 hour back up for a power outage, or where a community centre has the right facilities to provide a community hub for services in an emergency, are factors to consider in assessing criticality, but also in identifying community level opportunities to set up hubs for resilience or other options that do not necessarily involve more investment in network assets.

Defining criticality is likely to be a combination of the number of users impacted, local risks and threats, key dependencies and where there are essential services such as hospitals or water supply pumps or supermarkets. Assessing criticality will enable both strategic planning and emergency management planning with customers.

Any model to assess criticality across the infrastructure system, must only be a tool for investigation purposes and not impose where or how infrastructure providers focus their investment. While it could be a tool for planning and looking at options with customers, directing specific action linked to the assessment could force overspend in assets that all customers have to pay for, when there are likely to be alternative options.

4.4 National security risk can be managed alongside other risks

We support an approach where infrastructure providers are managing national security risks alongside, rather than separately to, all risks. There may be a case for government being able to intervene only when there is clear evidence of repeated under-performance, for example if there was repeated failures of an organisation's risk management system and a major security incident occurs.

We support the introduction of measures to direct management of national security risks if there are safeguards in place and use of these powers is a last resort. Our preference is for the government to continue to support non-regulatory measures such as briefings, alerts, and encouraging the sharing information or reporting about risks and protections.

The discussion document is focused on powers to direct infrastructure providers in the case of cyber risk. During Cyclone Gabrielle, it became apparent that government powers did not extend to enabling EDBs to deliver a key response measure - sharing of workforce into the worst affected areas was hampered as there was no ability to secure seats on limited regional flights, even though there was a state of emergency. This may relate more to emergency powers and the Emergency Management Bill but we raise here as an example where powers of intervention would be expected but are not currently available.

4.5 A new government agency is likely to increase complexity rather than improve infrastructure resilience

Resilience is so integrated with other aspects of infrastructure that it would be difficult to make this a separate responsibility for a separate agency. It is integrated with risk management, strategy, planning, investment, pricing,

information, reporting. It is also an integral consideration in emissions reduction, resource management consenting, and environmental management. In our view, while resilience could be a stronger responsibility within some existing systems, there is no case to separate it out as a new responsibility or agency or regulation.

We encourage the government to focus on getting the resilience requirements right across the infrastructure sectors, and funding enhanced resilience for communities, rather than thinking about agency arrangement. If the requirements are clear, these can still be implemented by different agencies eg Commerce Commission for energy and Taumata Arawai for water.

There are already policy coordination mechanisms for cross-government agency topics. If required, an existing agency could provide additional coordination or delivery oversight across infrastructure and/or review overarching policy settings for resilience barriers, for example the Infrastructure Commission could oversee information sharing and cross-industry standards. As so many critical infrastructure providers are not government agencies, a multi-sector governance structure is more relevant than one government agency, and this could be developed based on the existing regional lifelines groups.

4.6 Reporting, compliance and enforcement to build on existing systems

Powerco is already subject to reporting and compliance mechanisms through the Commerce Commission's regulation of electricity and gas distributors which includes penalties for poor reliability and financial performance. An additional regime is not warranted but the existing regime could include more resilience information.

The discussion document doesn't acknowledge the existing mandatory reporting requirements under this market regulation or other reporting forms with specific resilience or adaptation reporting for example XRB reporting standards. We strongly recommend aligning and streamlining reporting requirements and forms, not creating new reporting. The XRB standards could be the base for this.

Reporting and compliance obligations are most effectively targeted at an entity level rather than individuals. We do note an international trend in consideration of specific directors' duties, but believe obligations can be appropriately caught by existing director duties.

4.7 Ensuring resilience through fuel diversity

As highlighted in section 3.1 (A range of megatrends are shaping our infrastructure system) and 3.3 (This reform will need to look at a number of existing regulations and other reforms), there is a link between decarbonisation policy, emissions reduction targets and resilience which is not apparent in the discussion document. We endorse a more careful analysis of these linkages in the resilience reform and provide the following commentary on the resilience value of fuel diversity as one point for analysis. The proposed systems approach to infrastructure resilience will not only improve coordination of dependencies and interdependencies but will also recognise the resilience value of a broad interdependent system, including multiple fuels.

Fuel diversity is necessary to provide resilience today, through to 2030 and beyond. The reliability and fuel diversity benefits of natural gas, and low-carbon gas in the future, has significant resilience value. The value of the gas network for community resilience was demonstrated during Cyclone Gabrielle – see case study below.

Case study: The value of a resilient energy option following Cyclone Gabrielle in Hawke's Bay

In February 2023, Cyclone Gabrielle caused unprecedented devastation across the North Island. Over 107,000 Powerco electricity customers were affected by power loss (33% of our network). There was significant damage to our electricity network across Coromandel, South Waikato, eastern Bay of Plenty, Taranaki, Manawatu and the Wairarapa. The significance of the damage and length of outages to Unison Network's electricity network in Hawke's Bay were even more significant.

Powerco's gas network in Hawke's Bay proved high resilience and an essential lifeline for customers without electricity in the region. While our gas pipeline crossing the Ngaruroro bridge in Napier sustained damage through being pulled from the supporting structures due to flooding and slash, its integrity was maintained, and gas supply was not interrupted. All other bridge crossings and underground pipes remained undamaged and there was no loss of gas supply throughout our Hawke's Bay network during this cyclone event. Gas supply for cooking and hot water provided an essential lifeline for many Hawke's Bay residents when electricity was not available.

Field crews worked in difficult conditions over several days to check the integrity and accessibility of our critical network assets ensuring they remained safe and operational, with our emergency contingency plans supporting this process. Learnings at the Ngaruroro site will help make this part of the network even more resilient in future events by relocating that pipeline to the opposite side of the bridge where it will be less susceptible to damage. Resilience, reliability and learning from events is always a focus for Powerco in our asset management planning and our climate adaptation planning.

A clear outcome from this devastating event is that natural gas networks can be more resilient than electricity in the face of natural hazards and can continue to provide a critical energy option when electricity reinstatement may take some time. The event also highlighted that the value of resilience is much more than the economic cost of not having an energy supply. It is about the societal cost and community impact when there are long extended periods without energy amidst the other devastating consequences faced by residents during and after such an event.

In general, gas networks demonstrate high reliability compared to electricity networks due to the different risks faced by each of them. Using the Powerco 'Lower' gas network and the Wellington Electricity network for comparison the average minutes of disruption per customer in the 2022 reporting year are shown in **Error! Reference source not found.** illustrating a vast difference in the duration of unplanned interruptions. We have used this data for comparison noting that duration data is a priority measure for the Commerce Commission.

Fuel diversity offers essential resilience for homes throughout New Zealand, beyond piped gas. For example 33.3% of New Zealand homes use a wood burner for heating, 6.3% portable gas heaters and 11.7% fixed gas heaters. In the South Island, 44.1% of homes use wood for heating while only 10% use gas heating.⁹

Fuel diversity offers critical back-up for essential services in times of energy outages. For example, from 2026 the new Wellington Wastewater sludge minimisation facility¹⁰ will use a more resilient approach on a space-limited site to reduce sludge dumped to landfill. Anaerobic digestion will break down sludge, produce biogas, and that biogas will produce heat and electricity to process the waste.

A gas connection is a critical part of that system to ensure a continued process in the event of an on-site fuel issue. This example shows the complex interdependencies between waste treatment, fuel use, infrastructure, and resilience in real-life situations. Fuel diversity and back up options for essential services or industries, or at community level will may involve diesel generators being a higher emissions resilience option which is not an outcome sought.

A recent report for Business New Zealand Energy Council¹¹ undertook detailed sensitivity modelling of the TIMES-NZ models and concluded that

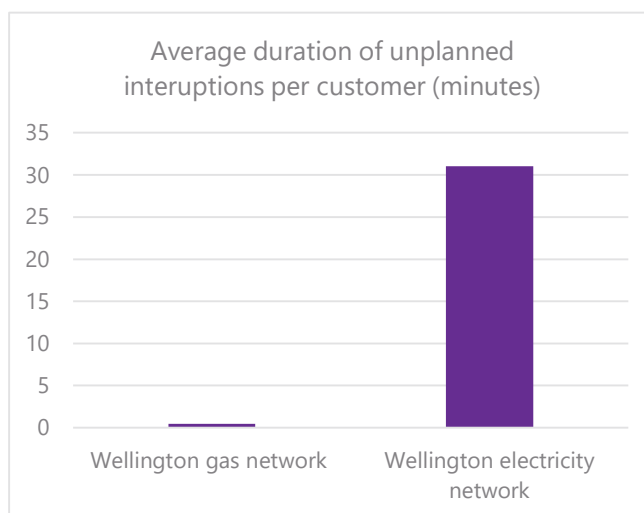
Removing fuel options from decision-makers will almost certainly increase the cost of meeting New Zealand's emissions budgets, unless low emissions options are made available (and decision-makers are confident of their availability) at a similar cost. Hence, improving resilience, meeting emissions budgets, and keeping downward pressure on costs in the face of a changing world will benefit from greater choices of, and confidence in the availability of, cost-effective, low-emissions fuel options.

...

From an emissions and cost perspective, our advice to policymakers is therefore to focus on enabling energy system decision-makers to respond to unexpected changes in the energy system – based on their assessment of the situation as it arises and the options available to them.

Fuel diversity does not mean ongoing use of natural gas as it has been for the last fifty years. Powerco is committed to supporting an appropriate phase out of fossil gas and development of renewable gas. The transition period for the next 30 years will need to carefully managed so it does not impact resilience.

Figure 1 Network reliability reported for Wellington gas and electricity networks 2022¹



⁹ Census 2018 data from StatsNZ. Summary data on heating at [Environmental Health Intelligence New Zealand \(19446-Types-of-Heating-FA2 .pdf \(ehinz.ac.nz\)\)](#) and [Figure NZ \(Main types of heating used in New Zealand homes – Figure.NZ\)](#)

¹⁰ [Projects - Moa Point sludge minimisation facility - Wellington City Council](#)

¹¹ [Energy-Strategy-Deep-Dive-Using-TIMES-NZ.pdf \(bec.org.nz\)](#)

Powerco is committed to setting green gas targets and delivering this through our gas network. There is sufficient availability for biogas to be used in place of some existing fossil gas uses. An application of the technology is already in place in New Zealand, along with many overseas. Initially, blended gas is a feasible option, and then increasing biogas proportions over time. Evidence shows that use of biogas or blended gas in our current network will not require reinforcement or replacement of pipelines, therefore providing for best use of significant existing infrastructure asset as part of a resilient low carbon future. This outcome aligns with the challenge from the Infrastructure Commission to use existing infrastructure more efficiently.¹²

To accelerate the development and use of biogas as part of a resilient infrastructure system, we strongly encourage the government to provide confidence for gas distributors and industrial processors to continue to develop the current opportunities. Distributors and industry need confidence that this biogas option is not being foreclosed before getting to the first milestone with a blended option, noting that recent Climate Change Commission commentary¹³ does not reflect the development or availability of biogas or provide the necessary support for renewable gas as an energy option for New Zealand.

We endorse a systems approach to strengthening resilience that recognises the value of fuel diversity for resilience. A systems approach will not only improve coordination of dependencies and interdependencies but will also recognise the resilience value of a broad interdependent system. The interdependencies between fuels is complex and we encourage modelling for resilience analysis across all relevant government policy reviews, with those related to fuel optionality and the future of gas a current priority.

¹² [Energy | New Zealand Infrastructure Commission, Te Waihangā](#)

¹³ [2023 Draft advice to inform the strategic direction of the Government's second emissions reduction plan » Climate Change Commission \(climatecommission.govt.nz\)](#)

Attachment 2 – Information about Powerco

Connecting communities

We bring electricity and gas to 1.1 million customers across the North Island. We're one part of the energy supply chain. We own and maintain the local lines, cables and pipes that deliver energy to the people and businesses who use it. Our networks extend across the North Island, serving urban and rural homes, businesses, and major industrial and commercial sites. We are also a lifeline utility. This means that we have a duty to maintain operations 24/7, including in the case of a major event like an earthquake or a flood.

The cost of operating our business is not dependent on the amount of gas or electricity we distribute in our networks. These costs reflect the need to maintain the safe operation of the network and are mostly driven by compliance with regulations. This includes replacing assets when they reach their end of life. Additional costs to grow the capacity of the network are often met by customers requiring the upgrade or new connection.

Under Part 4 of the Commerce Act, Powerco's revenue and expenditure are set by the Commerce Commission as part of monopoly regulation. We are also subject to significant information disclosure requirements, publicly publishing our investment plans, technical and financial performance, and prices. The regulatory regime allows us to recover the value of our asset base using a regulated cost of capital (WACC) set by the Commission, and a forecast of our expenditure. Every five years, the Commission reviews its forecasts and resets our allowable revenue. This process is designed to ensure the costs paid by customers for us to manage and operate our network is efficient given we are a monopoly and an essential service.

Our electricity customers

Powerco is New Zealand's largest electricity utility by the area we serve. Our electricity networks are in Western Bay of Plenty, Thames, Coromandel, Eastern and Southern Waikato, Taranaki, Whanganui, Rangitikei, Manawatu and Wairarapa. We have 28,441 km of electricity lines and cables connecting 344,000 homes and businesses. Our place in the electricity sector is illustrated below.



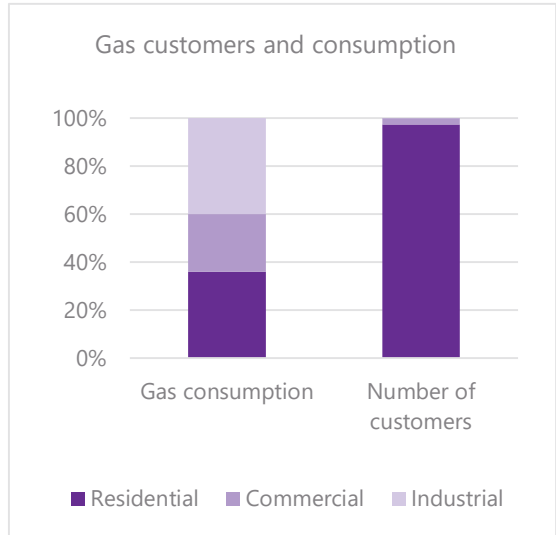
Our network contains a range of urban and rural areas, although is predominantly rural. Geographic, demographic, and load characteristics vary significantly across our supply area. Our development as a utility included several mergers and acquisitions that have led to a wide range of legacy asset types and architecture across the network.

Powerco is one of 29 electricity distribution companies. Our customers represent around 13% of electricity consumption (similar in magnitude to the Tiwai aluminium smelter) and around 14% of system demand. Powerco's network is almost three times the size of Transpower's in terms of circuit length. The peak demand on our combined networks (2022) was 986 MW, with an energy throughput of 5,266 GWh.

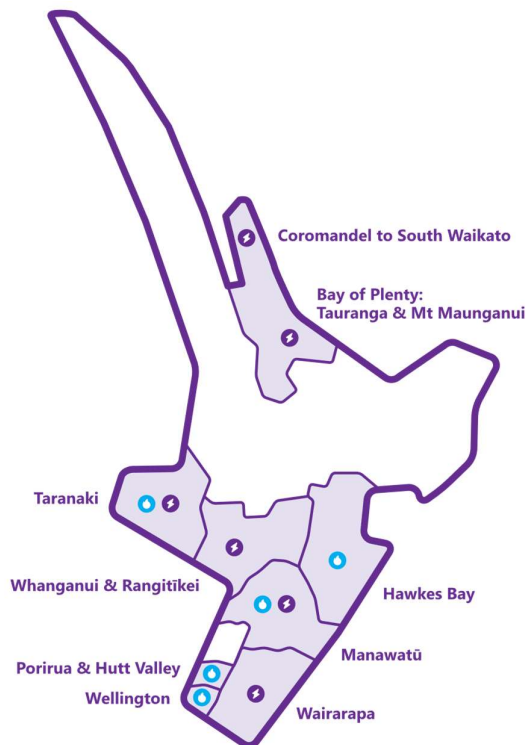
Our gas customers

Powerco is New Zealand's largest gas distribution utility. Our gas pipeline networks are in Taranaki, Hutt Valley, Porirua, Wellington, Horowhenua, Manawatu and Hawke's Bay. We have 6,100 km of gas pipes connecting 113,000 homes and businesses to gas.

Our customers consume around 8.6 PJ of gas per year. Our industrial customers are less than 1% of our customer base and consumer approx. 40% of gas on our network. Our residential customers are 97% of our customer base and consume approx. 35% of gas on our network. The remaining 25% of gas is consumed by our commercial customers. Around 30% of our larger customers are in the food processing sector, around 20% in the manufacturing sector and around 10% in the healthcare sector.



Gas and Electricity footprint



Our network footprint

We operate within six regions and across 29 district or city council areas.

Our network represents 46% of the gas connections and 16% of the electricity connections in New Zealand.