Te Kāwanatanga o Aotearoa
New Zealand Government

June 2023

Strengthening the resilience of Aotearoa New Zealand's critical infrastructure system

Summary discussion document

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Aotearoa New Zealand is exposed to a wide range of hazards that can wreak havoc and devastation on lives and livelihoods. The destructive impact of earthquakes, volcanic eruptions, and extreme weather events are all too familiar for New Zealanders, as we recently experienced with Cyclone Gabrielle. Unfortunately, it is not just natural hazards that can trigger infrastructure failures, causing severe disruption to our society and economy. There are a range of other threats, such as cyber attacks, espionage, and terrorism, which can bring the delivery of crucial services to a halt.

Historically, we have tended to respond to infrastructure failures reasonably well, but as the recent power, communications, and water outages demonstrate, there is a pressing need to boost the resilience of our critical infrastructure system. This question only becomes more urgent when we consider the compounding risks posed by climate change, a deteriorating national security environment, fragmentation in the global economy, and rapid technological change.

For these reasons, the Government committed in its response to Rautaki Hanganga o Aotearoa, New Zealand's first Infrastructure Strategy, to consult on improving our current regulatory settings so we can deliver a robust and resilient critical infrastructure system.

This document, which provides a **summary of the information available here**, is the first step towards delivering on that commitment. It describes what we mean when we talk about critical infrastructure and resilience, and it outlines why a resilient critical infrastructure system matters for our country and people. It explores the trends that are going to make critical infrastructure resilience more important and the barriers that need to be addressed to deliver better outcomes that will benefit us all.

It is important that the steps we take to enhance critical infrastructure resilience are informed by a wide range of perspectives and designed in partnership with all New Zealanders. With your input, we can design a fit-for-purpose regulatory framework that ensures our critical infrastructure system is best positioned to manage the range of risks we face today and in the future.

As part of this consultation, the Government is seeking your views on:

a. the need to adapt our approach to critical infrastructure regulation, to create a more secure platform for sustainable, inclusive, and productive growth in the future

b. potential options for delivering a more resilient critical infrastructure system.

Feedback on this paper will inform the development of a subsequent consultation document on options for reform, planned for release in early 2024.

We invite individuals and organisations to provide their views on the ideas in this document. You can do this by:

attending a public meeting **with details available at consultation.dpmc.govt.nz**; and/or

completing a written submission and emailing it to **infrastructureresilience@dpmc.govt.nz** or posting it to:

National Security Group
Department of the Prime Minister and Cabinet
Level 8 Executive Wing, Parliament Buildings,
Wellington 6021

The closing date for submissions is 8 August 2023.

Resilient critical infrastructure underpins our health and prosperity

What is critical infrastructure?

Critical infrastructures provide a range of services that are essential to the functioning of our society. Loss, damage or disruption to these services can adversely affect our economy, security and, most importantly, threaten lives and livelihoods.

What constitutes critical infrastructure is not currently defined in New Zealand law. However, there are a wide variety of entities across New Zealand that provide essential services, including the following sectors: energy, telecommunications, water services (for fresh, waste and storm water), food and grocery, financial services, digital services, transport and health.

These kind of entities, and the assets, systems, and networks that make them up are what we refer to as 'critical infrastructure'.

What is resilience?

Resilience is the capacity of our critical infrastructures – and the critical infrastructure system that they collectively make up – to absorb a shock, recover from disruptions, adapt to changing conditions, and retain essentially the same level of function as before.

Resilience is not just the physical characteristics of the asset – it also requires organisations to have the right kind of leadership and culture, networks and relationships, and organisational processes in place before an event, so that they can adapt, recover, and thrive afterwards.

Why is resilience important?

Private businesses, civil society, and government are all responsible for ensuring the continued functioning of our critical infrastructures – but the government has a particular interest for the following reasons.

Resilient infrastructure supports wellbeing.
Cyclone Gabrielle has clearly demonstrated how catastrophic the consequences of infrastructure failure can be, as disruptions flow across the critical infrastructure system and one outage triggers another. For example, widespread power outages can cause communications networks to fail, limiting people's ability to access critical emergency information and use payment systems (such as EFTPOS) to purchase essential food and medicines.

Resilient infrastructure supports economic growth.
Resilient critical infrastructure gives people confidence to take risks, invest, and grow their businesses. In an uncertain world defined by complex challenges like climate change and geopolitical competition, a resilient critical infrastructure system will attract productive and sustainable foreign investment.

Resilient infrastructure saves money.
Research by the New Zealand Institute of Economic Research has found that early investment in infrastructure resilience is cheaper than the cost to repair after an event. By investing early and reducing the Crown's significant – and growing – exposure to infrastructure failures, funding can be freed up to deliver on other government and community priorities.

Figure 1: Critical infrastructure can take many forms, including (but not limited to):

Currently, we have limited tools to ensure critical infrastructure resilience

To date, the New Zealand government has not taken a comprehensive or coordinated approach to critical infrastructure regulation. No agency has policy or regulatory responsibility for New Zealand's critical infrastructure system.

Instead, New Zealand's regulatory approach has been focussed on protecting critical infrastructure assets within a given sector – for example, ports, airports, telecommunication networks, power stations, and water plants are each regulated in isolation.

Primary responsibility for determining what level of resilience is appropriate currently sits with critical infrastructure owners and operators, with their decisions typically informed by:

- pressure from consumers and other critical infrastructure owners and operators, to provide a minimum level of reliable service
- specific regulatory requirements where they exist (for example, those that the Electricity Authority imposes on energy market participants).

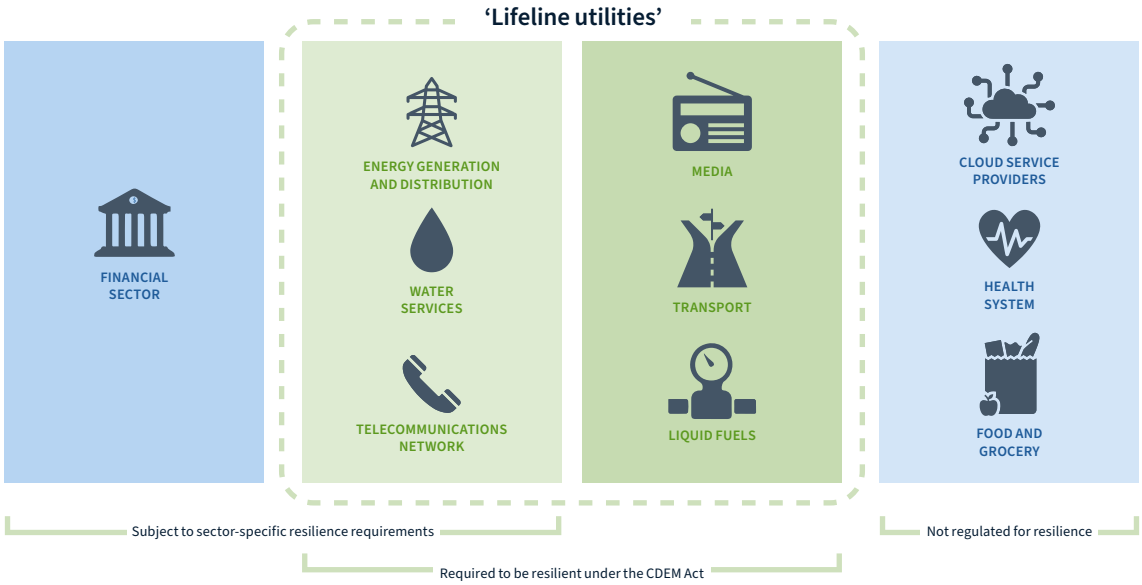
There are limited exceptions to this sector-level approach, most clearly in relation to emergency preparedness and response through the Civil Defence and Emergency Management (CDEM) Act 2002. This Act requires 'lifeline utilities' (a limited subset of our critical infrastructure) to "function to the fullest possible extent" following an emergency.

The diagram below provides a simplified overview of New Zealand's approach to regulating infrastructure resilience.

This sector-by-sector approach to delivering resilient critical infrastructure has historically served us reasonably well. However, its decentralised nature has meant that:

a. insufficient attention has been paid to building a shared understanding of risks, vulnerabilities, critical infrastructure interdependencies, and mitigations
b. we lack consistent resilience standards to manage risks to our critical infrastructure system
c. we are unable to mitigate and remediate weaknesses within that system in a coordinated way.

Figure 2: Simplified overview of statutory resilience requirements.



We urgently need a more resilient critical infrastructure system

New Zealand's environment and geography mean that our critical infrastructures are exposed to a broader and more consequential range of potential shocks than any other highly developed country. Our geography makes us particularly prone to a range of natural hazards, while we remain susceptible to other risks that are not geographically confined, such as cyber attacks.

Lloyds' assesses that New Zealand has the second highest disaster loss risk in the world.

Japan, another country on the Pacific Ring of Fire, is the only other high-income country in the top ten (with risks less than half of New Zealand's).

The United Nations Disaster Risk Reduction database highlights that New Zealand's natural hazard risks are unusually weighted towards low frequency and comparatively unpredictable but inevitable high impact events (also known as 'high impact but rare events'). In particular, earthquakes and tsunamis, but also volcanic eruptions.

Global megatrends pose challenges for our critical infrastructure system

Four global megatrends are placing increased pressure on our critical infrastructure system. These trends will present new challenges, amplify existing vulnerabilities, and heighten the risk of infrastructure failure.

Megatrend #1: Climate Change

Climate change will have a range of direct and indirect effects. Direct impacts include:

- more extreme and frequent weather events
- more frequent and severe droughts
- sea level rise.

Indirect impacts include:

- continued transformation of electricity generation and distribution
- changing consumer demands and preferences.

Megatrend #2: Deteriorating national security environment

New Zealand faces a more challenging strategic environment than it has for decades.

This increases the risk of deliberate attacks on infrastructure, including through:

- espionage
- sabotage
- cyber attacks.

Megatrend #3: Economic fragmentation

Geopolitical competition has put the rules that underpin global trade under increasing pressure. This means that:

- countries are more willing to exploit each other for strategic gains (for example, the use of trade or import restrictions)
- supply chains are less resilient
- divergent technology standards are emerging across countries and groups of countries, increasing costs and decreasing product availability.

Megatrend #4: Rapid technological change

Rapid technological change offers efficiencies and other opportunities but can also amplify risks. For example, the uptake of new technologies has contributed to:

- the emergence of new types of critical infrastructure that are not subject to any regulation
- increased vulnerabilities to cyber attack
- more links between critical infrastructures, causing failures to spill further across the critical infrastructure system.

The growing risks to our critical infrastructure system

New Zealand's regulatory approach is increasingly out of step with global best practice.

A range of countries and regions – including Australia and the European Union – are shifting from sector-level regulations to a system-wide regulatory approach. Such an approach allows requirements to be set evenly across all critical infrastructure sectors to manage the risk that weakness in any critical infrastructure creates systemic weaknesses across the critical infrastructure system.

In light of cascading and prolonged infrastructure outages affecting large numbers of New Zealanders, it is clear that change is required. We are seeking your views on what you think is required to strengthen the resilience of our critical infrastructure system, with a focus on addressing the following **four barriers** to resilience.

Ad hoc and inadequate information sharing on issues fundamental to infrastructure resilience

Limited tools to manage threats to our national security

No enforceable minimum resilience standards

Unclear government and private sector accountabilities for delivering critical infrastructure resilience

The costs of lifting infrastructure resilience

The government is highly conscious of cost-of-living pressures and that the investments required to deliver more resilient critical infrastructure may be passed onto New Zealanders through higher prices for goods and services.

In designing options for reform, the Government would seek to lift resilience at least-cost through:

- focussing, at least initially, on 'lifting the resilience floor', particularly for critical infrastructures not subject to regulation – recognising that many owners and operators are already investing a lot in their resilience
- timing the introduction of any new regulatory requirements to align with investment plans, to the extent possible
- considering direct support for more vulnerable New Zealanders to ensure that boosting resilience does not reduce access to essential services.

There are four potential barriers to delivering a more resilient critical infrastructure system

Barrier 1: Information sharing is ad hoc, rather than comprehensive and systematic

Why is information sharing important?

The exchange of information on hazards, threats, outages, and near-misses is essential to enable:

- critical infrastructures to target resilience investments towards their most important assets and managing the most significant risks
- regulators to develop proportionate settings that are fit for purpose.

How well is information shared between government and critical infrastructure owners and operators currently?

Information sharing between government and infrastructure owners and operators is fragmented and often ad hoc, with only certain types of risk assessment information shared publicly (for instance, on the likelihood of natural hazards or the effects of climate change).

This, in part, reflects that New Zealand has no secure platform for the exchange of sensitive information.

Will any reforms already underway fix this problem?

No. there are no mechanisms currently planned to better ensure the timely flow of information on specific threats, including those that may undermine New Zealand's national security.

Transparency around certain issues will be increased through the establishment of the Natural Hazards Commission and the release of the first National Security Strategy (outlining national security risks).

Barrier 3: There are limited tools to manage national security risks

Why does the government need tools to manage national security threats to our critical infrastructure system?

New Zealand faces a deteriorating national security environment, and our critical infrastructure system is an attractive target for espionage, sabotage, cyber attacks, and other types of interference.

The government has a unique understanding of this environment – and given its access to sophisticated intelligence and cyber capabilities – will often be best qualified to detect and disrupt such threats. In some instances, the government may need to take action quickly to mitigate or respond to threats.

Clear direction and intervention powers, such as those adopted by Australia to manage significant national security threats, could support this.

How well can the government intervene to manage such risks currently?

The government does have some tools to intervene to support the response to a significant cyber threat to New Zealand's critical infrastructure, but not any other type of threat.

Will any reforms already underway fix this problem?

No.

Barrier 2: There are no enforceable minimum resilience standards

Why are enforceable minimum resilience standards important?

Critical infrastructures cannot operate without services provided by other critical infrastructures (for example, many power grids rely on telecommunications networks to function). Minimum resilience standards can:

- mitigate the risks that vulnerabilities in any critical infrastructure asset could pose to the entire system's stability
- align investment in resilience to the level that New Zealanders expect (given limited market incentives to do so)
- counteract cognitive biases that lead to underinvestment in managing high impact but rare events that we are exposed to.

How effective are minimum resilience standards currently?

New Zealand has no mechanism to set enforceable and consistent minimum resilience standards for all critical infrastructure system. While the CDEM Act does impose a general requirement on lifeline utilities to be resilient against all hazards and threats, this requirement is unenforceable.

Will any reforms already underway fix this problem?

No. Through reform of the emergency management system, the Government proposes to extend the requirement to be resilient to a wider set of critical infrastructures. However, compliance cannot be verified or enforced.

Barrier 4: There are unclear accountabilities for system resilience in government and across the community

Why are clear accountabilities for the resilience of the system helpful?

Strengthening resilience requires coherent and well-understood accountabilities. This includes providing clarity on the responsibilities of critical infrastructure owners and operators as well as responsibilities across government for delivering a resilient critical infrastructure system.

Recognising this, other countries are establishing agencies with an exclusive focus on critical infrastructure. These agencies tend to be responsible for:

- developing and maintaining resilience policies and standards
- monitoring the implementation of these standards and taking enforcement action if they are not met.

How clear are accountabilities for delivering a resilient infrastructure system currently?

No agency or Minister has responsibility for developing policy applicable across the critical infrastructure system, including in relation to system resilience.

Similarly, no regulator has powers to monitor or enforce minimum standards. This precludes us from verifying that critical infrastructure is as resilient as the New Zealand public might expect.

Will any reforms already underway fix this problem?

No.

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