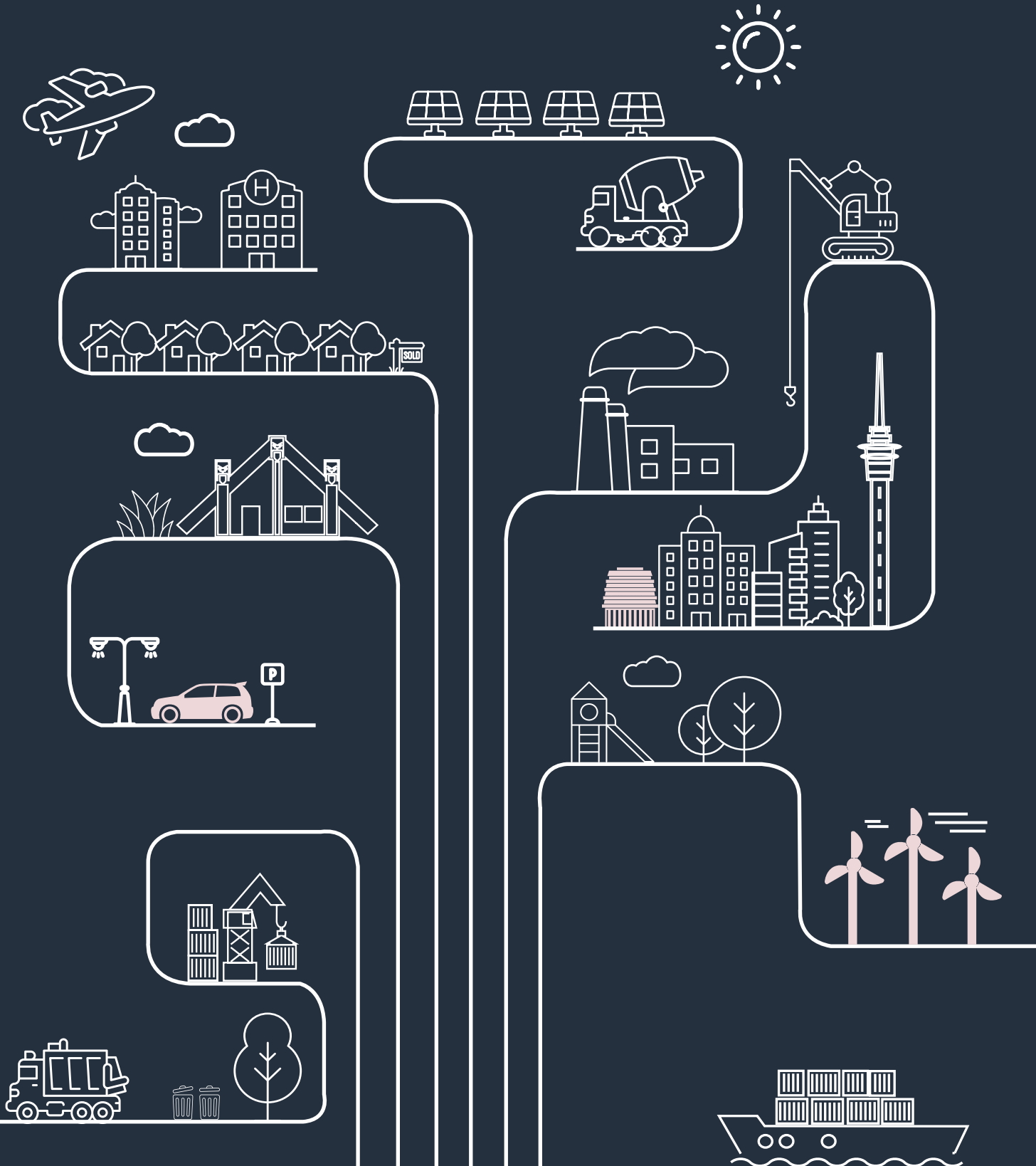


Delivering low carbon infrastructure.



BUDDLE FINDLAY
INFRASTRUCTURE

buddlefindlay.com



Jennifer Caldwell
Partner and National Chair



Our summary

Infrastructure is the backbone of a healthy economy; reliable infrastructure enables trade and delivers the utilities essential to business. It also provides the social assets essential for community wellbeing, such as schools, hospitals, and civic amenities. As of September 2021, New Zealand's resident population is over five million, with half a million people added to the population since 2013. Unfortunately, our infrastructure and service provision has not kept pace with growth, so that New Zealand's infrastructure deficit is now estimated to be NZ\$75b.

Increased infrastructure investment is seen as a lever to deliver economic stimulus, post-COVID-19 and into the future. As of Budget 2021, the Government has set aside NZ\$57.3b of Crown spending to address New Zealand's deficit over the next five years, with a further NZ\$2.6b allocated for 150 shovel-ready projects.

We have also noticed the sense of urgency around climate change, particularly the bold decisions needed to decarbonise the economy and meet our international obligations. Declaration of a climate emergency may have been largely symbolic, but the Zero Carbon Act sets clear emission reduction targets, soon to be detailed in the draft Emissions Reduction Plan. The goal is zero net carbon emissions by 2050. By meeting these targets, we will be playing our part in limiting global warming to 1.5°C above pre-industrial levels.

The New Zealand Greenhouse Gas Inventory 1990-2019 paints a stark picture of the challenge we face:

between 1990 and 2019, New Zealand's gross emissions have **increased by 26 percent** (17,189 kt CO₂-e) with a noticeable increase in devastating weather events including floods and wildfires.

Abundance of analysis

There is no shortage of analysis and policy direction, both for the infrastructure gap and the decarbonisation challenge. Earlier this year, in May 2021, the Climate Change Commission delivered its Final Advice, with the Government set to deliver its final Emissions Reduction Plan in December. This has since been pushed back to May 2022, due at least in part to the recent COVID-19 lockdowns.

The Infrastructure Commission, Te Waihangā, is also consulting on its Infrastructure for a Better Future report. The Government Policy Statement on land transport 2021 confirms climate change as one of four strategic priorities; funding decisions on transport infrastructure are already being shaped by emissions-reduction commitments.

At the same time, the Government has embarked on an ambitious programme of resource management law reform, following on from the Resource Management Review Panel Report in July 2020. Three new statutes are promised by the end of 2022.

This includes a Climate Change Adaptation Act and a Strategic Planning Act, which seeks to place infrastructure planning at the heart of the resource management process. Submissions were recently heard by the Environment Select Committee on the Natural and

Built Environments Bill exposure draft of the purpose and key principles sections.

Build back better

How to navigate these blustery winds of change with resilience and agility?

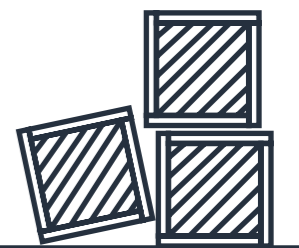
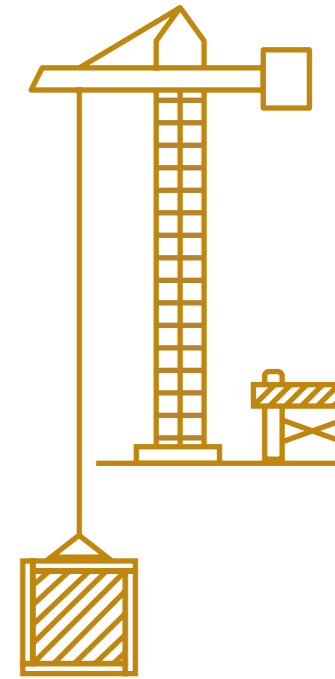
At the APEC meeting in July 2021, leaders from across the Asia-Pacific region recognised that if individual economies make smart decisions in dealing with the impact of the pandemic, there is potential for the region to emerge from this crisis with more inclusive and digitally enabled economies, better infrastructure, and improved prospects available to all its citizens, regardless of age, race, gender, or economic and social standing. We have a rare opportunity to align significant public investment with urgent public need.

To that end, we have taken a step back and asked ourselves the following question: what do you need to know today to make decisions that commit capital and resources for the future? Whatever piece of the infrastructure and decarbonisation puzzle your business or organisation represents, we hope to offer some insights across a range of sectors.

We discuss the challenges of the existing regulatory framework, the need for innovation in green and sustainable funding options, trends in construction contracts to address carbon requirements; and finally, how to adapt if your assets are located on the coast as sea levels rise. We hope you find it valuable and as always, our team is here to support and advise.

Contents

Let's not lose sight of the wood for the trees	6
Financing the infrastructure deficit	8
Delivering on ESG has benefits in finance and beyond	12
Four Pou drive infrastructure decisions	14
At a glance	16
Five emerging trends as construction begins contracting towards carbon neutrality	18
Industrial manufacturers face challenges in cutting emissions	20
A trifecta of tax levers to drive decarbonisation	22
Climate-related disclosure - the first step not the last	24
Does New Zealand have what it takes to reduce its emissions?	27
Promoting decarbonisation - what is required for effective reform?	28
Decarbonising the land transport system	30
Will your bach or business be underwater in 100 years?	34
Appendix 1 - Survey - your thoughts on decarbonising infrastructure	36





Let's not lose sight of the wood for the trees

Under current policy settings, Aotearoa will struggle to meet its commitment of achieving net-zero emissions by 2050 - but there is an opportunity to fix that.



Decarbonising New Zealand's economy will require phasing out the use of fossil fuels to generate electricity, to run industrial processes, and in transporting people and goods. The transition away from fossil fuels in the transport sector will itself significantly increase demand for renewable electricity, potentially by over 50% of current demand by 2050. To keep pace with this change, experts predict that over 40 new renewable power generation projects will need to be connected to the national grid by 2035 - that is, as much generation will need to be built in the next 14 years as has been built in the last 40+ years.

As identified by the Climate Change Commission in its June report, *Ināia tonu nei*: a low emissions future for Aotearoa, there is much work to be done by the Government and participants in the electricity sector to deliver this outcome. One important piece of the puzzle will be how to ensure a reliable supply of electricity in dry years - the Government is 'thinking big' by exploring potential pumped hydro solutions, while others favour alternatives such as large-scale green hydrogen production or distributed generation with smaller-scale battery storage. Electricity pricing is another key piece of the puzzle.

Just as fundamental, however, is the question of how quickly the required renewable generation can be consented, funded, and built.

It is more challenging than ever to obtain resource consents for large-scale infrastructure under the Resource Management Act 1991 (RMA), with emerging environmental bottom lines and strong drivers to avoid adverse effects on wetlands, streams, and indigenous biodiversity.

So the need for many new wind farms or hydro schemes around the country will bring into sharp focus an environmental conundrum: is some level of impact on our native fish, birds, bats, lizards, and insects acceptable, in an effort to stave off the catastrophic effects on all species of anthropogenic climate change? And more broadly, should the RMA 'consenting scales' be tipped in favour of renewables, ahead of other factors such as landscape qualities, 'naturalness' of the environment, visual intrusion, noise, and other rights of adjoining property owners?

This vital question for our society (and others around the world) has been playing out in RMA contexts that are highly technical and focused, which carries a risk of people losing sight of the broader global perspective.

Currently, renewable generation does not benefit from a significant policy leg-up, and many doubt whether current policy settings will enable New Zealand to meet its commitment of achieving net-zero emissions of long-lived gases (and reducing biogenic

methane emissions by between 24% to 47%) by 2050. As the Productivity Commission noted in its 2018 Low-emissions Economy report, the key RMA national policy document intended to support renewables "has made no difference to the time, complexity and cost of obtaining consents for renewable electricity generation investments (particularly wind- and hydro-generation)." The Commission urged the Government to take steps "that will speed decision-making on renewable energy generation consents under the RMA. Reasons for some urgency exist."

Despite that urgency (and the Government agreeing with these recommendations), the policy changes have not eventuated; rather, the Government's focus has been on enhancing protections for freshwater bodies and indigenous biodiversity - that is, on setting environmental bottom lines rather than stretch targets for renewables. While these are valid aspirations, the policy measures have further increased consenting complexity and cost.

The climate opportunity afforded by reform

Meanwhile, the policy agenda has moved on, to the repeal and replacement of the entire RMA apparatus. This exercise gives a golden opportunity to reset national-

level environmental directives, to smooth a clear pathway through consenting processes for renewable energy developments.

While there are many important reasons to seek to protect and enhance New Zealand's waterways, forests, and native species, it is equally vital that our environmental laws and policies do not have the unintended consequence of inhibiting our country's efforts to reduce reliance on fossil fuels and play our part in tackling climate change.

The exposure draft of the new Natural and Built Environments Act - one of three pieces of legislation to replace the RMA - has been released, and it incorporates various policy levers that could be pulled to give a preference for renewables.

One is that the draft identifies a number of environmental outcomes that must be promoted under the new system. Conspicuously absent is an expectation that people's 'amenity values' - things like views and quietness - will be preserved, which is positive for renewables. Also positive is that the listed outcomes include that "greenhouse gas emissions are reduced..." and "the ongoing provision of infrastructure services to support the well-being of people and communities, including by supporting... an increase in the generation... of renewable energy".

These are listed after numerous other outcomes requiring various

environmental values to be "protected, restored, or improved", however submitters to the select committee have queried whether a hierarchy between these outcomes is intended. If there is to be a hierarchy, there must be a strong argument, based on the existential threat posed by climate change, for an increase in renewable generation to be at or near the top of the outcome rankings. The final wording of these outcomes will be critically important.

How those outcomes are to be realised (and competing outcomes reconciled) will be described in a new National Planning Framework, which will bring national-level planning instruments together into a combined set, and the new Natural and Built Environments Plan for each region. Long-term Regional Spatial Strategies will also be developed, under a separate new Strategic Planning Act, to identify areas that are suitable for development and that need to be protected or improved.

Again, these new instruments present an opportunity to prioritise the urgent development of renewable energy projects. At the very least, they should provide for certain environmental 'bottom lines' to be flexible enough to allow a developer of renewables to implement positive ecological measures to offset or compensate for any unavoidable impact on ecological values.

Given the urgent drive to decarbonise New Zealand's economy, however, more radical measures may be merited.

One option could be to incentivise regions - and perhaps even private landowners - to maximise the areas tagged for new renewables or extensions to existing wind farms. Another option is to introduce fast-tracked consenting processes for renewable projects, with limited grounds for refusing consent and limited rights of public participation, such as are currently available to specific listed 'shovel-ready' projects to address the economic impacts of the COVID-19 pandemic. Large swathes of Aotearoa are currently classified as 'outstanding natural landscapes', which garner special protection, so the way in which such landscapes are identified could also be revisited.

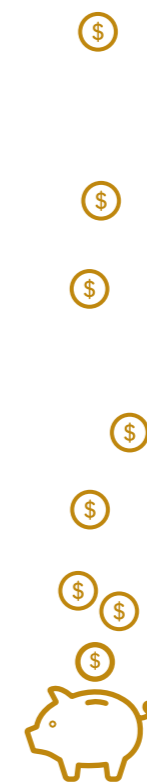
At a time when the RMA machinery is being redesigned, a failure to lower the barriers to consenting projects that will help decarbonise New Zealand's economy could literally amount to losing sight of the wood for the trees.

Author: [David Randal](#)

Financing the infrastructure deficit

“We know that climate risk is investment risk. But we also believe the climate transition presents a historic investment opportunity.”

LARRY FINK, BLACKROCK



From 2000 to 2020:

- Debt capital made available to companies carrying out renewable energy projects went from 1.71% of total infrastructure financing to 12.17%
- Debt capital made available to companies carrying out non-renewable power generation went from 61.49% to 6.06%
- Debt capital made available to companies carrying out social infrastructure projects went from 2% to 16.78%.

SOURCE: EDHECINFRA

New Zealand has an infrastructure deficit that stems from decades of underinvestment. Finding ways to fund the numerous transport projects, social housing builds, schools, hospitals and other infrastructure assets required to bridge the deficit has been a perennial challenge for New Zealand.

In the past, we have sought to fill the funding gap by the use of PPPs (public private partnerships) - where private enterprises took on the task of building and funding public infrastructure. More recently, under the current government, the central Government balance sheet has been put to work by funding the 'shovel ready' programme and numerous other infrastructure projects approved by central government.

However, an economy the size of New Zealand cannot afford to fund all of the work that needs to be done through the Government balance sheet and the PPP model has been put on ice. Now, the challenge of funding infrastructure has become even more difficult with an overlay of decarbonisation, sustainability and climate change mitigation.

The good news is that there is no shortage of private capital available to fund infrastructure projects in New Zealand or internationally.

Infrastructure is seen as an ideal investment for superannuation and pension funds, insurance companies and other investors looking for long-term stable returns. There is also a growing trend internationally for investors to move their investments out of traditional industries and into investments which can meet standards of ethical, green and sustainable development - including sustainable infrastructure.

“Sustainable infrastructure projects' are those projects that are planned, designed, constructed, operated and decommissioned in a manner to ensure economic and financial, social, environmental (including climate resilience) and institutional sustainability over the entire life cycle of the project.”

New Zealand is in an ideal position at present to capitalise on the move to ethical and sustainable investment. A number of New Zealand's infrastructure requirements could be structured as sustainable infrastructure - from solar farms and wind farms in the energy sector to upgrades of three water systems designed to provide better water quality outcomes to upgrades of transport systems to reduce carbon emissions.

And with the implementation of the Climate Change Commission's recommendations we have an ideal opportunity to make choices to promote sustainable projects that will not only achieve the country's overall sustainability and greenhouse gas reduction efforts, but will also attract private investment capital that will mean the projects can be constructed sooner with less pressure on the government's balance sheet.

In order to bridge the infrastructure deficit and to ensure that new and existing infrastructure assets are developed, retrofitted and maintained in a way that prioritises environmental and social sustainability as well as climate resilience - private capital (both equity and finance) has an instrumental role to play.

Private capital and sustainable Infrastructure - a dynamic relationship

Globally, there is a dynamic relationship emerging between sustainable infrastructure and green finance.

- On one hand, the balance sheets of financial institutions are increasingly exposed to climate change effects. The nature of lending means that the exposure of a customer to more frequent severe weather events (fire, flood, droughts) and rising sea levels can become an aggregated exposure for financial institutions. These climate change effects heighten credit, market and liquidity risks - which can destabilise a financial institution and even the broader financial system.
- On the other hand, the infrastructure deficit in New Zealand has a funding gap. The Government balance sheet has capacity constraints as to how much infrastructure it can fund.

Green finance is a tool available to financial institutions to combat climate risks in their loan and investment portfolios. Green finance can also be the source of capital to fund sustainable infrastructure - helping bridge the infrastructure funding gap.

Green finance

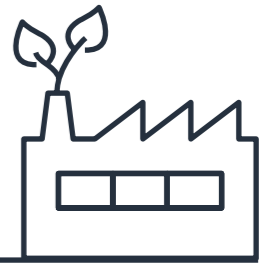
Sustainable infrastructure development in New Zealand has the opportunity to tap into two different regimes for funding - the green loan market and the sustainably linked loans market.

Green loans and sustainability linked loans are regimes governed by a framework of market standards and guidelines developed by industry bodies and market participants with a view to promoting the development and integrity of green finance.

- **Green loans** are any type of loan instrument made available exclusively to finance or re-finance, in whole or in part, new and/or existing eligible green projects. Green projects include:
 - renewable energy
 - energy efficiency (new and refurbishing buildings, smart grids, etc)
 - pollution prevention and control
 - clean transportation
 - sustainable water and wastewater management
 - green buildings.
- **Sustainability linked loans** are any types of loan instruments/facilities which incentivise the borrower's achievement of ambitious, predetermined sustainability performance objectives.



“It is becoming increasingly more difficult for developers of 'dirty' infrastructure assets to access funding for development”



A sustainability linked loan can be differentiated from a green loan as the sustainability linked loan focuses on the on-going sustainability profile of a borrower over time rather than the delivery (and maintenance) of a specific green project. It is for the borrower to set sustainability performance targets (which are agreed with the lender) by reference to key performance indicators, external ratings and/or equivalent metrics by which the borrower's sustainability profile can be tracked for the purpose of the loan.

Sustainable debt - bonds and loans raised with environmental and social purposes in mind - rose 29% to NZ\$732.1b in 2020, the greatest issuance amount ever in a single year, according to energy research group.

BLOOMBERGNEF

Banks going green

Ever since the European Investment Bank issued the first green bond in 2007, there has been an accelerating trend of banks using their position in the economy to drive efforts to mitigate climate change - both at a local level and at an industry level. Many banks have signalled their intent by choosing to sign up and be held accountable to international industry conventions.

The most notable local and international conventions include:

United Nations Finance Initiative: Principles for Responsible Banking

As of today, 240 financial institutions (including New Zealand's four largest trading banks) have signed up to the United Nations Principles for Responsible Banking which requires each bank's business strategies to be consistent with the goals of the Paris Agreement.

The Principles for Responsible Banking provides the framework for a sustainable banking system, enabling the banking industry to demonstrate how it makes a positive contribution to society. The principles embed sustainability at the strategic, portfolio and transactional levels across all business areas on financial institutions.

Signatory banks commit to taking three key steps which enable them to continuously improve their impact and contribution to society:

1. Impact analysis: identifying the most significant impacts of products and services on the societies, economies and environments that the bank operates in
2. Target setting: setting and achieving measurable targets in the bank's areas of most significant impact
3. Reporting: publicly report on progress on implementing the principles, being transparent about impacts and contributions.

United Nations Finance Initiative: Net-Zero Banking Alliance

The Net-Zero Banking Alliance brings together 53 banks from 27 countries representing almost a quarter of global banking assets (over US\$37t), which are committed to aligning their lending and investment portfolios with net-zero emissions by 2050.

Members of this alliance have agreed to accelerate and support the implementation of decarbonisation strategies and the setting of intermediate targets at 2030 or sooner.

New Mandatory New Zealand Climate-Related Disclosure Regime

In April 2021, the New Zealand Government has introduced legislation to make climate-related disclosures mandatory for some organisations. If approved by Parliament, the legislation will require around 200 large Financial Markets Conduct Act reporting entities to start making climate-related disclosures for financial years commencing in 2022, with disclosures being made in 2023 at the earliest. These requirements would extend to all registered banks, credit unions, and building societies with total assets of more than NZ\$1b.

The challenges for infrastructure in transition

While the green finance trend presents multiple opportunities for funding of sustainable infrastructure, it is also the harbinger of change for environmentally damaging infrastructure projects and practices.

It is becoming increasingly more difficult for developers of 'dirty' infrastructure assets to access funding for development - the industries in the cross hairs at the moment include oil and gas facilities, mining and fossil fuel fired power stations.

However, there is risk in transitioning away from traditional infrastructure before you have your sustainable replacement infrastructure in place. Infrastructure projects are complex and integrating sustainable and climate related factors into their design, planning, and operation adds further complexity. And the process of transition doesn't happen quickly - generally, infrastructure assets can have a consenting phase of over three years with a building phase of three to seven years. Closing down traditional infrastructure too fast can result in unintended consequences. We have seen this recently in the electricity sector where sustainable generation is growing quickly but we still need coal and gas fired plants to 'keep the lights on'. If the policy settings discourage investment in traditional generation and asset owners cannot obtain finance or find that financing for new projects is more expensive because they don't meet the criteria for sustainability, then the risks for the economy are exacerbated.

As a result, a modern economy will continue to require investment into carbon heavy infrastructure assets as part of a broader strategic movement to decarbonisation.

As private capital shifts towards sustainable infrastructure, this may leave central governments as the funders of last resort for integral carbon heavy infrastructure assets.

There is a delicate balancing act between policy settings that encourage and enable the transition to a low carbon economy and the need to manage the transition in a way that does not result in significant damage to the economy.

Authors: Peter Owles and Daniel Collins



Delivering on Environmental, Social, and Governance (ESG) has benefits in finance and beyond

In September 2021, Peter Owles and Daniel Collins sat down with Dean Spicer and Karl Nicholson from ANZ to talk about the world of sustainable finance and infrastructure in New Zealand. Here's a snapshot of the wide-ranging discussion.

The role of private finance in infrastructure in New Zealand

Q: What's your view on the role of private finance in infrastructure development in New Zealand generally? Do we have enough tools in the toolbox to facilitate financing for infrastructure?

A: Private finance has a role. If you look at the infrastructure that is performing well, we look at things like telecommunications and electricity - both of which are privately financed. Clearly, you don't want everything privately financed. However, when you're talking about billions of dollars' worth of investment that needs to be built, it doesn't make sense to restrict yourself to using one method of financing. New Zealand is a small country, and we need to be utilising everything we can to close the gap.

The tools are available. There is not anything out there that is not available in New Zealand. It's just the willingness to use them.

Green loans and sustainability-linked loans (SLL) markets

Q: Where do you see the green loan and SLL markets developing in New Zealand? Is there going to be such a tidal wave that is going to take over the market and create this huge incentive for corporates to go much greener than they are?

A: The trend is going to continue. Take financing out of the picture and you see that stakeholders have driven this whole macro-trend. Businesses today realise that they need to be able to evidence the fact that they are taking these broader issues seriously; in other words, they need to be able to factor in environmental and social concerns. This isn't going to turn around any time soon.

The interesting thing is, as a bank, when we go to capital markets and think about the questions we're being asked by investors, that bar for green finance is rising every year. The expectations of investors, in terms of the disclosure requirements and evidence that the banks and their customers are delivering on a green strategy, has been like a blow torch.

Q: And this is having an impact on capital raising?

A: Those companies that don't, or can't move with this trend towards green finance, are at the risk of finding capital hard to come by in the future. If they're unable to embrace a green strategy, they'll find that capital will become more expensive over time. But one of the things that comes up again and again is that once you complete a sustainable financing transaction, whether it's a green bond or a sustainably linked loan, that the improved stakeholder engagement has been a big plus, and often it's the internal stakeholders, the staff, who are the most engaged.

Green financing is effectively bringing different parts of the business together. The financing piece is a proof point of the whole concept being bought to life for that business.



Today ESG is mentioned in every conversation we have with a corporate. The exception is not talking about it. Even the companies you wouldn't expect to, are coming to it. And one of the big points is that new hires are asking what is your ESG Policy? Honestly, if you don't have one it's harder to attract good people.

Financing "less green" projects

Q: What does this movement towards financing of green projects mean for projects or infrastructure maybe which doesn't tick all the green boxes, which our economy and the world's economy still need?

A: The first point is that every infrastructure project will have to be greener than it is. The reality is that banks and investors will likely still get stuck in legacy investments like coal fired projects because there's no refinance market.

The second point is every organisation including less 'environmentally friendly' projects like new roads, which do need to be financed, will have to be procured in the greenest possible way.

Incentivising banks to lend green

Q: Do you think there's more that can be done to enable banks to provide more incentive to support low carbon infrastructure or green lending?

A: We are going to get there without the Reserve Bank of New Zealand having to do anything. In our risk models, more and more risk is being built in for transition to a low carbon environment. If a customer doesn't have a transition plan, they're going to be marked down and that's happening quickly.

From a project finance perspective, we've certainly got clients who need to put more thought into their transition plan and, as a result, they are a lot harder to get credit approvals for which is the reality.

As a bank, there is an incentive in terms of greater depth of investor if you go to markets in a green format and potentially a small pricing benefit as well. So as markets develop that pricing differential will increase, as investors will expect a higher return if they're going to be financing something that doesn't meet ESG criteria.

Final comments

Q: Any final comments?

A: This is the biggest change in the industry that we've seen in the generation. Look at industries like electricity. It's turning electricity on its head, which hasn't changed for 70-80 years, and we're about to see it completely change within 10 years. You can apply that to a lot of other industries.

Four Pou drive infrastructure decisions

June McCabe, Chairman Te Waka Pupuri Pūtea, Te Rarawa.

Q: Tell us about Te Waka Pupuri Pūtea, Te Rarawa?

A: Te Waka Pupuri Pūtea is the commercial arm of Te Rūnanga o Te Rarawa. Based in Kaitaia, it is responsible for all Te Rarawa commercial assets with an estimated value of NZ\$90m including fisheries, forestry, farming, horticulture, property and a recently developed water storage lake named Te Tupe Hau - the windswept sandhills along Te Oneroa a Tōhē [Ninety Mile Beach].

Q: Tell us about Te Waka Pupuri Pūtea investment strategy and how this intersects with the movement towards green infrastructure investment?

A: Te Rūnanga o Te Rarawa maintains Ngā Pou E Whā, the Four Pou Principle, as the basis for all conduct undertaken by the Rūnanga - including its investment in infrastructure.

The Four Pou are, Te Oranga (social), Te Taiao (environmental), Te Rarawatanga (cultural) and Te Ōhanga (economic).

The Four Pou are interconnected and each Pou cannot be considered in isolation from the others. In this way, the Four Pou Principle represents a foundation upon which Te Waka Pupuri Pūtea strives to fulfil the objective: “to grow a sustainable economic base that

will support Te Rarawa whānau, hapū and iwi.”

As a Four Pou investor, we are intergenerational, long-term and any investment we make must demonstrate in our decision-making how each of the Pou will be impacted positively. It is a four-dimensional framework - it's more than just risk and reward. Some may call it ESG investing but it is more than that. It is the life and soul of the Rūnanga. It's about our relationship with the whenua and the principles of kaitiakitanga (guardianship of the land) - this closely aligns to the practice of environmental sustainability. It's about employment opportunities for the local people and economic prosperity. It's about identity - strengthening our cultural identity for our whānau, hapū, iwi.

Q: What is an example of the Four Pou in practice for Te Waka Pupuri Pūtea?

A: Lake Te Tupe Hau at Te Oneroa a Tōhē (Ninety Mile Beach), is an example of an investment that positively addresses the Four Pou.

The water storage lake provides water security and resilience for our 660ha orchard and 420ha dairy farm, ensuring sustainable businesses growth and development: Te Ōhanga along with positively impacting Te Taiao (environmental) and Te Oranga (social) through employment (economic). Finally, this project is part

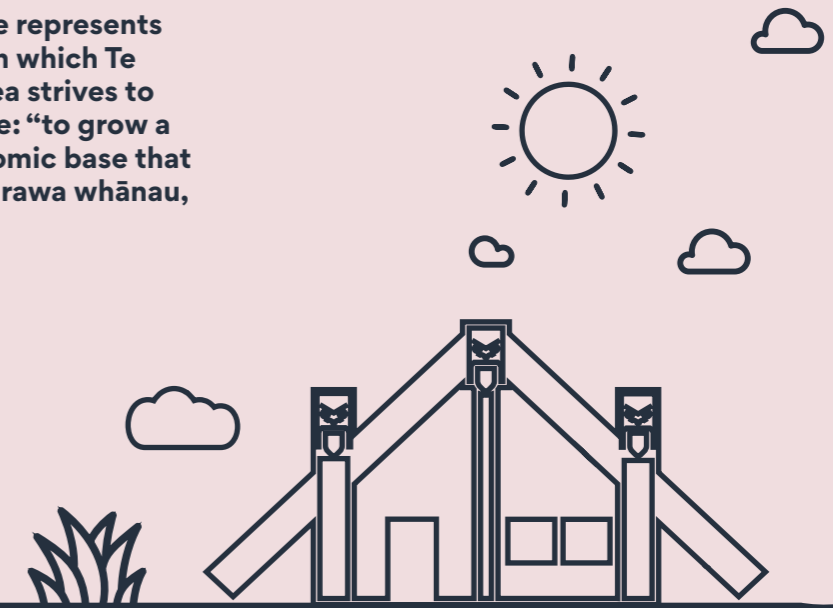
of a broader strategy to deliver the fourth Pou - Te Rarawatanga (cultural) - The investment in horticulture and Lake Tupehau strengthens our cultural identity post settlement as an iwi with vision and foresight in the area of horticulture and farming including developing Te Rarawa appellation brands.

Q: What are the challenges for Māori Inc participating in the development of New Zealand's infrastructure?

A: None of this is easy. We have a number of challenges when delivering infrastructure projects in the Far North. From the state of the existing infrastructure, access to funding, access to a skilled labour force, to the challenges of dealing with the constraints of land designated as Māori land.

Delivering outcomes often requires partnership with local and central government and, at times, having to navigate the hurdles of local government and central government. In the context of infrastructure, a genuine partnership approach to engagement is not always present. We are often asked to engage with an issue or a proposal, whether it's water quality, roading infrastructure or housing solutions, but without the resources or time that is available to the other parties. This reduces our ability to provide meaningful engagement.

Four Pou Principle represents a foundation upon which Te Waka Pupuri Pūtea strives to fulfil the objective: “to grow a sustainable economic base that will support Te Rarawa whānau, hapū and iwi.”



We also have to navigate our own people and other iwi. As we have a number of assets that are shared with other iwi, we have to be strategic in our own thinking and decisions, and we also have to work with other iwi and get everyone aligned on the way forward.

And last, but certainly not least, we must take our own people on the journey. Our own people aren't always necessarily our biggest supporters at the outset - so we need to undertake our own engagement process internally.

While it isn't easy, at Te Waka Pupuri Pūtea our Four Pou mean we know where we stand, and when they all come together, we create something to be proud of.

Q: In the Far North, how do you prioritise infrastructure projects?

A: We have so many things to do as a consequence of much under investment. In this moment in time, we haven't got the capability or capacity to do everything we need to do.

The Far North needs new roads, new three water infrastructure, new social housing - the list goes on. This means it is all about priorities and this is very much led by what the government considers to be important - as they play an important role in unlocking funding and bringing the support of central government to bear on delivering projects. However, as an

iwi investor, we contribute in the multitude of discussions and policy forums to advocate for our priorities and be a meaningful contributor to the execution of agreed projects. Te Tupehau is a demonstrable example of this.

Q: How is Te Ao Māori an advantage for Te Waka Pupuri Pūtea when thinking about sustainable practices?

A: As a Four Pou investor, we have an opportunity to view an investment through a lens which is not solely focused on economic return - we can consider broader outcomes.

It means we can try different things and learn from them - like when the iwi gave some of its water from its dairy operations to the Kaitaia town supply to stop the town running dry.

This went from idea to action in a short space of time because we didn't view the farming operation solely through the lens of capital return and cash flow. We viewed the business in its capacity to provide outcomes more broadly - including in this context, the ability to help our people and the people of Kaitaia have water security. We are innately intergenerational in how and what we do - that is Te Ao Māori.

At a glance

We invited our clients and contacts to share their thoughts on New Zealand's decarbonisation status and asked input on what the priorities should be to move towards a low carbon economy.

*Full survey results can be found in [Appendix 1](#) on page 36.

28.4% have climate plans in place and...



... **47.2%** are putting plans in place



Cost was the biggest obstacle

according to recipients to deliver low carbon infrastructure projects



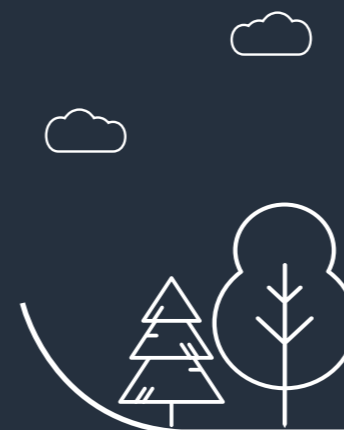
68.8%

said reducing carbon emissions is a priority within their organisation



Respondents suggest that **environmental outcomes should be a top priority**

when decisions are made about new infrastructure projects



41.7% of respondents read the Climate Change Commission report

Lack of Government incentives and strong direction were seen as obstacles to delivering low carbon infrastructure projects



68.4% of small businesses

are prioritising waste management as their main sustainability initiative



41.7% of respondents were uncertain that the new Acts to replace the RMA will be good for a lower carbon economy



7.1% of respondents had a bad feeling about the new RMA reforms

78% of respondents

think investing in railways should be a transport priority



Five emerging trends as construction begins contracting towards carbon neutrality



As we press towards carbon neutrality, currently targeted for 2050, there are five trends emerging in engineering, procurement and construction contracts in New Zealand and around the world. These trends affect all project participants - funders, project sponsors, developers/principals, contractors and others in the project supply chain.

1. Consenting to become increasingly challenging

We expect that projects will be subject to more legal challenge on environmental and sustainability grounds. We see this trend emerging overseas, for example in the United Kingdom through the challenge to the proposed expansion of Heathrow Airport - on the grounds that it is inconsistent with the United Kingdom's climate targets. We are also beginning to see this happen domestically through the Lawyers for Climate Action's challenge to the Auckland Regional Land Transport Plan on similar grounds. While we expect these challenges to be, at least initially, confined to the project consenting phase, as the climate situation worsens, there seems a real prospect that projects may remain subject to the threat of ongoing challenge.

In a contractual context, developers, contractors, and other members of the project supply chain will need to be alive to these risks and, we suggest, deal with them in their project documentation. The fundamental question is who is 'on-risk' for the time and cost consequences of delays relating to such challenges.

2. Extension of performance warranties and guarantees

We envisage funders, project sponsors and developers/principals requiring contractor warranties and guarantees extending beyond conventional performance and 'design-life' requirements, like defect-free operation, to include operational compliance with carbon neutral requirements. The practical effect of these requirements is likely to markedly increase the potential liability of contractors and designers - a risk that they will, without doubt, price into their tender response. Like any emerging regulatory requirement, this will likely result in a more complex and refined contractual treatment of liability allocation to failure to comply with environmental regulatory requirements together with variation mechanisms to respond appropriately to changes in law and client requirements during the design and construction stages.

On a similar, but more practical point, we expect to see developers/principals placing more emphasis on buildings designed and developed in a way that supports multiple long-term tenancy options. This recognises that the construction of a new building has a significant carbon footprint and seeks to mitigate that footprint by optimising the longer-term use of the building. As a result, we expect to see developers/principals requiring, as part of their request for proposal process, that buildings be designed with ease of adaptability or retrofit in mind.

3. Requirements of funders, project sponsors and developers

Funders, sponsors and developers are already under ever-increasing public and regulatory scrutiny in relation to setting, and delivering against, environmental and sustainability requirements for projects. In addition, as part of their wider environmental, social and corporate governance objectives, public sector organisations and businesses (particularly listed companies) are increasingly setting their own targets. These requirements and targets will relate not only to the completed project but also to materials and methodologies used during construction, which must be then passed-down the project supply chain by funders, sponsors and developers.

Contractually, this will be achieved through the conventional mechanisms of design consultancy agreements and construction contracts. We also expect a role for "third party agreement" provisions under which, for example, certain sustainability requirements of a funder, sponsor or developer are passed down to the main contractor, with the expectation that the main contractor will comply with these requirements as if they were a primary contractual counterparty. It is a natural extension that the contractors, and their subcontractors and suppliers, will be evaluated against a client's carbon-neutral requirements and targets as part of competitive tender processes.

At a practical level, we are already seeing innovation with construction materials and methods, such as:

- Processes such as off-site construction
- Emerging materials such as mass timber and carbon capture concrete and energy capture and storage tools, such as solar panelling or batteries
- Incentivisation of more efficient use of plant and machinery and transition from diesel fuelled plant and machinery
- Prioritisation of locally sourced equipment and labour

- Improved logistics and planning to minimise site deliveries
- Undertakings to formally offset of carbon emissions.

We are also aware of overseas funders and project sponsors using financial incentives for developers to deliver projects within certain pre-determined sustainability targets - for example, through a reduction in the cost of borrowing for the developer/principal.

4. Additional relief for extreme weather events

Similar to what has occurred recently with COVID-19 related matters, we expect that contracts will become more sophisticated in allocating risk for extreme weather events - given the frequency of extreme weather events is predicted to rise dramatically. We doubt that it will be a realistic 'solution' for clients to simply allocate the risk to the contractor and expect the contractor to price or insure against the risk.

5. Widening of 'applicable law' and provisions to explicitly respond to environmental and sustainability concerns

The increased focus on environmental and sustainability requirements and targets is likely to result in contractual

performance frameworks customised to incentivising compliance and innovation in this area - as has occurred with workplace health and safety. Financial incentives and abatements could provide a basis for this contractual framework.

On this same point, we expect tendering developers/principals, contractors and other members of the project supply chain to have to demonstrate, at a granular level and as part of their tender response, that they are familiar with the applicable environmental and sustainability-based legislation.

Authors: [Tom Bennett](#) and [Ed McGimpsey](#)



Industrial manufacturers face challenges in cutting emissions



“Innovation can and should play a central role in New Zealand’s transition to a low-emissions economy. It is the closest thing to a “silver bullet” to enable humanity to meet the challenge of avoiding damaging climate change.”



Government slow to pursue carbon capture, utilisation, and storage

As all parts of the New Zealand economy take steps to decarbonise and lower emissions, the construction sector faces significant obstacles to doing its part. The largest construction sector emitters are iron, steel, cement, and aluminium. Their industrial processes contribute approximately 4.34% of overall New Zealand emissions plus, to a lesser extent, the emissions from process heat.

For this sector to decarbonise, they need new technologies to fundamentally change their manufacturing processes. While there are technologies being developed, they are a long way from being commercialised, and in some instances, these technologies may not be viable in New Zealand because existing production facilities may be unable to accommodate them.

Other than the emissions price, innovation and technological change are what matter most for long-term emissions reductions. In its August 2018 report *Low-emissions Economy*, the Productivity Commission points out that:

“Innovation can and should play a central role in New Zealand’s transition to a low-emissions economy. It is the closest thing to a ‘silver bullet’ to enable humanity to meet the challenge of avoiding damaging climate change.”

However, the speed, extent and type of technological change that reduces emissions and the impact of those changes on the economy, is highly uncertain.

In the manufacture of construction materials, emissions are largely generated from industrial processes. The Commission examined these industries and found that barring technological breakthroughs, opportunities to significantly reduce emissions from iron, steel, cement and aluminium production remain limited, though there is a higher potential for breakthrough technology in the production of cement than for other industrial processes.

Decarbonisation options

The limited decarbonisation options available to iron and steel manufacturers are a good example. Most emissions from the production of iron and steel result from the production of iron. Coal is used as a reducing agent in the manufacture of iron. CO₂ is created by heating and drying concentrated iron sand and coal; and converting the oxide in iron sand into iron.

Today there are only limited opportunities to directly reduce emissions from iron and steel production. Technologies do exist that use hydrogen produced from renewable electricity as the reductant to convert magnetite sands into iron. However, it will be 20-30 years before a commercially viable alternative product is manufactured. Recycling steel is a possible means of reducing emissions but this is outside the manufacturing process.

The same applies to cement. A core input to cement is lime. To produce lime, limestone is baked at high temperatures (ie, higher than 1000°C). This process releases CO₂. There are carbon emissions reducing technologies being developed including a process to recombine CO₂ released during lime calcination with calcium hydroxide to recreate limestone; and a magnesium-based cement has been invented that requires less heating than lime-based options. None of these initiatives are immediately available.

Carbon capture, utilisation, and storage

Given the limited opportunities for reducing emissions from these industrial processes, other technologies such as carbon capture, utilisation, and storage (CCUS) will need to be used. The International Energy Agency (IEA) says that these technologies will play an increasingly important role in reducing emissions, in heavy industries where the full elimination of emissions is difficult to achieve. The IEA says that CCUS is particularly important for cement and will be central to efforts to limit the process emissions that occur during cement manufacturing.

CCUS covers two concepts - carbon capture and storage (CCS) which involves capturing, compressing, transporting and permanently storing carbon dioxide emitted from large point sources; and carbon capture and utilisation (CCU) which involves capturing carbon and converting it into viable commercial products, such as construction materials, chemicals, and fuels.

CCU has the benefit of making carbon capture more economical, by generating revenue from the sale of captured CO₂. However, converting it consumes a great deal of energy, most prominently hydrogen, leading to high costs and strong demand for zero-carbon electricity.

The Productivity Commission considered CCS a potentially viable option for several large single-point emitters in New Zealand (eg steel, aluminium and cement). Some New Zealand emitters immediately cautioned against relying on it as a significant mitigation strategy, raising concerns around practicality, environmental risks and economic viability.

The Government has largely been slow to focus its efforts on CCS to date and has not taken up the Commission's recommendation to develop new legislation to regulate CCS in New Zealand. In its Final Advice to the Government, the Climate Change Commission has suggested that investigating the potential of other options to remove emissions from hard-to-abate industries, such as CCS or bioenergy combined with CCS, could be worthwhile but has ruled out relying on CCUS because it is an expensive, emerging technology that has not progressed beyond the concept and research stage in Aotearoa.

All of which leaves our industrial manufacturers almost no where to move when it comes to making their contribution to achieving New Zealand’s net-zero emissions target by 2050.

Author: [Bassam Magzhal](#)

A trifecta of tax levers to drive decarbonisation

It is evident that as the country moves towards decarbonisation, there are going to be changes in our legal system and our tax system. Society will have to accept this and factor it into the way that we operate. A key Government focus is reducing and eliminating carbon emissions in New Zealand. It is unsurprising then that tax is part of the equation when talking about how decarbonisation could be achieved.

The tax system is often used as a lever to manipulate a behaviour that is seen as desirable, and that politicians/society want more of, such as charitable giving, or to discourage a behaviour that is seen as harmful or detrimental and that politicians/society want less of, such as smoking.

If the tax system is used as part of the answer to climate change, then we believe that the most appropriate way to do this is to engage the trifecta of tax levers - incentives, disincentives and tax neutrality - to stimulate or reduce behaviours as necessary.

Many Government departments have already been tasked with consulting on various options for decarbonisation. This includes the Ministry of Transport who released a consultation document *Hikina te Kohupara* in May 2021 on options to accelerate the transport system towards decarbonisation. Part of the discussion is on potential changes that could be made to the tax system, including:

- A rise of tax on petrol - something that would make owning an internal combustion engine vehicle more expensive and therefore less attractive, while also being fairly cost effective to administer as the systems are already in place to collect such a tax
- A reduction in the level of GST on zero emission vehicles, which could increase demand for these vehicles
- A reduction in the cost of FBT on certain zero emission vehicles, which could make these vehicles more attractive to some businesses who provide vehicles to employees.

For businesses in the infrastructure industry, the tax system could also be utilised to both discourage carbon output and encourage a move towards decarbonisation of all products and processes used in infrastructure projects from creating roads to building and powering our homes, schools and hospitals.

Three levers

There are generally three ways that this could be done. The most talked about levers are incentives and disincentives. The third, lesser talked about, lever is tax neutrality - essentially ensuring that tax rules do not apply in an unexpected way to certain transactions and that would ultimately encourage the behaviour being discouraged or, that penalises the behaviour being encouraged.

Tax incentives

Tax incentives are designed to encourage more of a certain behaviour. In this case, the behaviour wanted is for businesses to stop emitting carbon and to move towards a zero-emission operating model. A tax incentive to encourage such behaviour could be more tax deductions for zero emission businesses, or a special tax rate on private investments in carbon neutral or carbon zero projects (this would encourage investment funding to be directed at climate friendly projects rather than ones that are not). While it is not strictly a tax being managed through the traditional tax system, the recently announced clean car

“A key government focus is reducing and eliminating carbon emissions in New Zealand. It is unsurprising then that tax is part of the equation when talking about how decarbonisation could be achieved.”



discount operates in many respects like a tax rebate that is run through the central Government (while the clean car fee will operate like a tax disincentive). This discount makes it cheaper for New Zealanders to buy electric and low emission cars.

While tax incentives appear to be a good thing, there are always questions as to whether the tax system is the appropriate place to be spending Government funds.

Tax disincentives

The most well-known tax disincentive relating to decarbonisation is a carbon tax. Such a tax is charged on the carbon output of a business and could significantly increase the cost of using products or processes with even a moderate level of carbon emissions. Such a disincentive is intended to make the use of non-zero emission products and processes unattractive and encourage business away from them in favour of zero emission options.

However, in many cases, the technology has not yet caught up with the products and processes needed to operate that industry. For example, there are not readily available carbon neutral or carbon zero replacements for heavy vehicles that are needed for many infrastructure projects.

Tax neutrality

In the current context, it may also be appropriate to review the tax system to ensure that tax is not a handbrake or impediment for the infrastructure industry to move towards decarbonisation. For example, a carbon tax could have an unintended consequence of making infrastructure projects more costly, while reducing the amount of money the industry has to move towards zero emission operations.

One way to ensure that there is tax neutrality could be to phase in carbon tax on industries, products or processes that cannot readily be decarbonised or replaced with a zero-emission alternative. This would allow the industry time to engage in more research and development to move towards decarbonisation instead of applying an immediate tax penalty, increasing operating costs and subsequently reducing the amount of funds available for decarbonisation efforts.

Constant adjustment needed

Whether changes to the tax system have the intended effect is not always clear in the short term - for example, the recent tax changes introduced to address the housing crisis do not yet appear to have immediately brought down house prices. In the longer term they might.

Even if new incentives, disincentives or special allowances for certain products or processes are introduced, as we move closer to achieving decarbonisation, the need for such changes will likely reduce. This means that as we move closer to being a zero-emission country, the levers are likely to be adjusted to meet the needs that exist at that future point in time.

Authors: [Tony Wilkinson](#), [Fiona Heiford](#) and [Maria Clezy](#)

Climate-related disclosure - the first step not the last

The Financial Sector (climate-related disclosure and other matters) Amendment Bill will amend the Financial Markets Conduct Act 2013 (FMCA) by creating a new Part 7A, "Climate-related disclosures for certain FMC reporting entities with higher levels of public accountability". In effect, large financial institutions (like banks, credit unions, building societies and insurers) and publicly listed entities will be defined as "climate reporting entities" (entities) and will be required to prepare "climate statements".

The Bill requires climate statements to be prepared in accordance with "applicable climate standards". The Government has indicated that these applicable climate standards will be created by the External Reporting Board and will be based on the recommendations of the Michael Bloomberg-led Task Force on Climate-related Financial Disclosures (TCFD), which have become widely adopted globally as best practice in climate disclosure.

What is forward-looking scenario analysis?

The cornerstone of the TCFD recommendations is the use of forward-looking scenario analysis. While such analysis can be complex and somewhat speculative, it is an established method for developing strategic plans that are

flexible and robust enough to suit a range of future states. Many financial institutions that will become subject to these new disclosure requirements will already be familiar with the use of forward-looking scenarios, as they are part of the supervisory stress tests currently undertaken by the Reserve Bank of New Zealand.

Scenario analysis involves an entity designing a number of hypothetical climate scenarios based on plausible, climate-related external events. Scenarios should not be exclusively favourable, and should also be based on events that, in the entity's assessment, could actually occur and have an impact on their business. For example, it is not useful to design a scenario based on a bushfire in California if the entity has very limited assets, business activities, customers or suppliers in California.

Climate scenarios should be designed based on risks and opportunities presented in different "scenario pathways". Examples of scenario pathways include:

- A pathway where the world is successful in limiting warming to under two degrees. Note the TCFD strongly recommends this pathway be used and therefore it is possible that such a scenario could become mandatory under applicable climate standards.

- A pathway consistent with New Zealand's National Defined Contribution (NDC) - New Zealand's NDC is currently consistent with two to three degrees of warming by 2100
- A business-as-usual pathway - this pathway would lead to at least three degrees of warming by 2100
- Other pathways based on an entity's understanding of expected future market trends in its industry and the impact of those market trends on the speed of the transition to a zero emissions economy.

Once the climate scenarios have been designed, entities should assess the impact that those scenarios are expected to have on things like asset valuations, increased liabilities to manage an event, changes to revenue, cash-flow constraints, business continuity capability, access to finance, impact on capital expenditure, impact on market share, impact on employees and other costs associated with an event.

How will scenario analysis and the resultant disclosures continue to develop?

The TCFD recommendations acknowledge that, especially in the early stages of preparing climate statements, the scenarios themselves

and the assessment of the impacts of those scenarios can be more qualitative and rely more on descriptive, written narratives, rather than a quantitative analysis. It is expected that over time, as entities gain more practice in climate scenario analysis, learning from other disclosures and drawing from better quality data, that the disclosures will become more sophisticated, as will an entity's ability to quantitatively analyse the impact of scenarios.

The reduced liability of directors for non-complying climate statements in the Bill, which requires that the entity and its directors knowingly fail to comply with applicable climate standards, suggests that Government is aware of the need to facilitate a 'learn by doing approach'.

What should be disclosed?

The TCFD recommendations focus on disclosing the implications of the climate scenarios on the four following core components of an entity's business:

Strategy

Stakeholders want access to information that enables them to set expectations about the future performance of the Entity - in the short, medium and long term. In order to set those expectations, stakeholders need to understand which climate-related risks and opportunities are expected to impact an Entity's activities, strategy and financial planning over those timeframes.

Risk management

Stakeholders should understand how an Entity identifies, assesses and manages climate risks and whether those processes are integrated into existing risk management procedures to understand an Entity's risk profile. Scenario analysis will help an Entity highlight any need for risk management in areas where a risk of lost revenue, increased cost, lower asset values, higher liability, business disruption or restricted access to finance or underwriting activities has been identified.

Governance

Stakeholders have an interest in understanding the process of how the climate risks and opportunities of the entity are assessed and managed by senior management. The outcome of these disclosures is that stakeholders will be able to better understand whether climate risks and opportunities receive appropriate attention from the board of management.



Metrics and targets

This section should draw from the Entity's strategy and risk management processes and describe how the Entity's success in its implementation of those strategies and risk management processes is measured. This helps stakeholders better assess the entity's risk-adjusted returns, its ability to meet ongoing obligations, its exposure to climate risks and its progress in managing and adapting to climate risks and opportunities, and compare it against its competitors.



“It is also well accepted that, in addition to the physical risks of climate change, the mis-pricing of climate risk is a fundamental threat to the global financial system and, by extension, to the economic health of society.”



Just the first step in climate related regulation or the end of the line?

The Bill may represent the most tangibly consequential piece of climate law in New Zealand's history. It has been established that climate risks are mis-priced in almost every aspect of the financial system, and that such mis-pricing results in the misallocation of resources and exposes stakeholders to risks that are not sufficiently understood, non-diversifiable and affect almost all industries.

It is also well accepted that, in addition to the physical risks of climate change, the mis-pricing of climate risk is a fundamental threat to the global financial system and, by extension, to the economic health of society. Indeed, the NZ Super Fund in its own TCFD climate disclosures released in October 2020 identified banking as one of five investments that presented the greatest physical climate risk to its fund.

Investors and other stakeholders understand that, just as with any other risk, climate risks must be measured and disclosed in order to be understood - and only then can informed decisions be made relating to how to respond to those risks and how to efficiently allocate financial resources. They also understand that a

standardised framework, as proposed by the Bill, is an efficient way to provide stakeholders with information that is relevant and comparable, and therefore can be better understood and can meaningfully influence decisions.

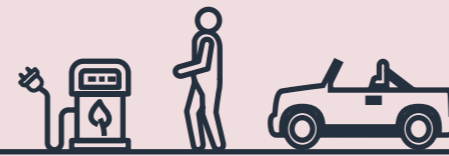
These disclosures are not only commercially valuable for external stakeholders. Engaging in the scenario analysis that underpins the disclosures will help directors and senior managers understand what risks the entity faces and what opportunities can be capitalised on.

In our experience, most entities believe financial statements add genuine value to their business by identifying what the business has done in the past and what it has the capacity to do in the future. Climate statements have the potential to add that same value to entities who engage meaningfully with the spirit of the process.

There is a real possibility that climate change could revolutionise government policy in the next ten years, which will surely flow through to financial regulation in some form. It is still too soon to tell whether climate change will result in a revolution of financial regulation, but we think it is clear that it will form a substantial part of the ongoing evolution of financial regulation, and we expect to see more

financial regulation to address climate change risk in the pipeline over the next five years.

Authors: [Scott Abel](#), [Lara Wood](#) and [Simon Jensen](#)



Does New Zealand have what it takes to reduce its emissions?



The Climate Change Commission's recent report focuses on gross emissions reductions to achieve New Zealand wide net-zero emissions by 2050 using a combination of technology and behaviour change.¹ The Commission is clear that displacing fossil fuel use with electricity is an essential part of the transition and will require major expansion of the electricity system. Internationally, renewable energy technology such as wind and photovoltaic solar (PV) is also being used to decarbonise economies. This is because, internationally, most electricity is generated by fossil fuels, coal and gas in particular. New Zealand has a different starting point, with an already high proportion of renewably generated electricity (80%-85%). Most carbon dioxide emissions in New Zealand come from our transport fleet, especially private vehicles, and high and low temperature heating, such as industrial processes, food processing, and building heating.

Recent research we conducted with colleagues at the University of Canterbury estimated that New Zealand would need to increase its electricity generation by around 120% to convert private vehicles to electric, replace low temperature heating, and replace existing fossil fuel electricity generation.² We also estimated that this would almost meet New Zealand's 2030 Paris Agreement Nationally Determined Contribution (NDC). While the actual number might not be as high as this, due to the use of biomass for heating, clearly, this is an inconceivably large amount of new generation in under a decade to deliver a low carbon infrastructure. Even if this development was as to occur by 2050 to meet net-zero 2050, it is still an enormous expansion in three decades.

Technical challenges in meeting this expansion include:

1. Developing enough renewable electricity generation
2. Transporting it from the renewable generation sites to users with appropriate transmission infrastructure
3. Ensuring sufficient energy supply from renewable generation between years as renewable resources vary from year to year
4. Ensuring generation and transmission capacity is available when needed to supply peak demand for electricity (or peak demand is managed)
5. Integrating an increasing range of new technologies like electric vehicles and PV into distribution networks that connect our homes and businesses without congesting the networks.

One of the most difficult of these challenges to solve is (3), ensuring sufficient energy supply from renewable generation. Being a country in the Pacific Ocean, New Zealand is too remote to allow interconnection with any other country. Therefore, it must have sufficient cover to provide energy in years when resources are low - low hydro inflow years being a particular challenge. As we approach 100% renewable electricity generation, this becomes even more of a challenge and is a particular priority. In moving towards greater renewable electricity for our energy needs, security of supply becomes even more critical. Ensuring security of electricity supply is critical if we are to successfully convert to an extensive electric vehicle fleet and electric process heat to reach our low carbon goals.

Author: [Dr Allan Miller, ANSA™](#)

¹ He Pou a Rangi Climate Change Commission 2021. Ināia tonu nei: a low emissions future for Aotearoa, 31 May 2021.

² Ian Mason, Harry Gates, Henna Chua, and Allan Miller 2017. Transitioning New Zealand to Renewable Energy, 2017 Electricity Engineers Association (EEA) Conference & Exhibition 2017, 21 - 23 June, Wellington.

Promoting decarbonisation - what is required for effective reform?

From the Three Waters programme, expectations of the Climate Commission, to uncertainty around the cost of projects and the repealing of the Resource Management Act 1991 (RMA), wholesale legislative change looms large for local councils. However, with their balance sheets stretched, their capacity to adapt remains low. For that reason, local authorities require clear guidance for dealing with greenhouse gases and climate change. Without it, New Zealand risks building long-term infrastructure that is not in line with our climate change obligations.

The Three Waters programme is one of the most consequential pieces of reform in decades. The reforms involve the merging of 67 local government-owned water service bodies into four independently governed entities. The model sets the platform for significant investment into our drinking water, wastewater, and storm water networks. The entire programme, which comprises of 461 projects, is forecast to require as much as NZ\$160b over the next 30 years.

The scale of the reform is enormous, so care must be taken to ensure that development is not stifled. From 31 December 2021, significant provisions of the Resource Management Amendment Act 2020 come into effect. These changes remove the prohibition (in sections 70A and 104E) on local

authorities having to regard the effect of greenhouse gas discharges on climate change, during both planning and consenting. In other words, for consenting applications lodged after 31 December, they must factor in their actual and potential impact on climate change.

The RMA also requires local authorities to consider both emissions reduction and national adaptation plans when preparing policy statements, regional and district plans. The former may include policies and strategies for meeting emissions budgets that have been notified. Meanwhile, a national adaptation plan sets out the Government's objectives for adapting to the effects of climate change, including how those objectives will be met. The Government was due to release an emissions reduction plan by December this year; however, that deadline has now been pushed back until May 2022. Operating in a policy vacuum will cause significant uncertainty and delay at a time that we need to be acting.

A two-pronged challenge is now emerging: how does the sector respond to the effects of climate change while also delivering a reduction in greenhouse gas emissions? For councils, wastewater plants often rank as their biggest emitters. The Climate Change Commission

recognises that certain industries are critical to the Three Waters programme, particularly steel and concrete. As it stands, both are irreplaceable cogs of the three waters upgrades. Nonetheless, if New Zealand is to meet its target of net-zero emissions by 2050, then industry is going to have to change its designs and the building material it uses. Although some low carbon alternatives exist right now, institutional barriers exist, such as price, the need for certification of new technologies (which is important for insurance and tender selection) and a need to implement innovations in the manufacturing process. From that, the real question is what can be done now and what can be delivered?

This requires flexibility and engagement with national and regional institutions responsible for a wide range of topics, including architecture, design, civil engineering, construction, certification processes, insurance, trades, and building code formation and enforcement.

Within local government, decisions on infrastructure are dictated by the levels of service they deliver to ratepayers. Councils have a legislated requirement to do so, be it for wastewater, rubbish collection or roads. To change those levels of service, councils must consult with ratepayers, meaning a balanced approach to decision-making to

“The RMA also requires local authorities to consider both emissions reduction and national adaptation plans when preparing policy statements, regional and district plans.”



“The Three Waters programme is one of the most consequential pieces of reform in decades. The reforms involve the merging of 67 local government-owned water service bodies into four independently governed entities.”



manage (political) risks. Councils also largely work in the 'here and now'.

Despite having a 20-year investment horizon, the immediate imperatives are the annual and three-year long-term plans. The result is that, in many cases, councils' default is to adopt a tried-and-true approach to infrastructure. Tried-and-true means that it works, has a track-record of doing so and can be readily maintained. But, in many instances, the more carbon friendly alternatives can not only be uneconomic but also untried. Transactional simplicity and certainty (with reduced political risk and reduced cost) are critical drivers.

While the Climate Change Commission has signalled its support for innovation, there is still no clear guidance available for councils and key stakeholders. Then there are the capital costs, as the long-term business case needs to be there to drive new investment in alternative materials. This is further complicated by work to repeal the RMA with the Natural and Built Environments Act (NBA), which the Environment Select Committee is due to report back on this month. As touched on in [previous articles](#), it is imperative that the NBA be drafted in a way that encourages flexible land use and/or development within key environmental limits. Greater clarity must be provided on the strategic priorities themselves,



“New Zealand cannot put its climate commitments on ice while the NBA systems and frameworks are developed. A flexible system is needed...”

and not leave that to the Minister or Courts to determine.

An enormous amount of investment is required to bring the Three Waters programme into being.

When substantive planning eventually commences, care needs to be taken to ensure that the economic and financial objectives align with New Zealand's climate regulations and commitments. Without this alignment, New Zealand risks locking in long-lived assets that trap us into old ways of doing things. Furthermore, as the regulatory environment becomes more prescriptive, there is also the risk of creating stranded assets that have low economic value in the future.

As a result, New Zealand cannot put

its climate commitments on ice while the NBA systems and frameworks are developed. A flexible system is needed, one that effectively utilises existing systems, encourages innovation and new technologies, efficiently knits together existing plans and systems and offers infrastructure and process adaptability in the future.

Author: David Allen



Decarbonising the land transport system

The daily commute has taken on a whole new meaning in these pandemic times, but it's set to be unrecognisable by the end of the decade.

Parliament declared a climate emergency in December 2020 and committed the Government to taking urgent action to reduce net greenhouse gas emissions (other than biogenic methane) to zero by 2050.

The transport sector currently accounts for around 20% of New Zealand's total greenhouse gas emissions, with most coming from road transport and 67% of those coming from the light vehicle fleet. Transport emissions need to "fall quickly, and significantly" to achieve this ambitious target.¹

The Climate Change Commission Final Advice delivered on 31 May 2021 paints a stark picture of the magnitude of transformation required to the land transport system and identifies two crucial areas of focus for the transport sector:

- Transformation of the vehicle fleet - phase out imports of internal combustion engine light vehicles by the early 2030s, accelerate uptake of electric and zero-emissions cars, buses and trucks
- Reduce reliance on cars and demand for travel - by supporting and substantially increasing funding

for walking, cycling and public transport, including by smart urban development, and increased working from home.

The Commission's advice will inform the Government's first three emissions budgets and the mandatory Emissions Reduction Plan (ERP) that will establish the policy framework required to meet the budgets. The ERP was originally due in December 2021 but has been delayed to May 2022 to align it with the Government's traditional budget announcement and to give stakeholders time to engage when COVID-19 alert levels allow. The delay is disappointing given the forthcoming COP26 Climate Summit in November.

While we wait for the ERP, however, we do have visibility of various Government workstreams that are feeding into it, including the Ministry of Transport's *Hikina te Kohupara - Kia mauri ora ai te iwi - Transport Emissions: Pathways to Net-zero by 2050*, released in May 2021 for public discussion. The three key themes of *Hikina te Kohupara* build on the work of the Climate Change Commission:

- **Avoid** emissions by changing the way we travel - shaping our towns and cities to make it easier, safer and more attractive for people to access

what they need by public transport, walking and cycling

- **Shift** to cleaner vehicles - decarbonise the light vehicle fleet, stimulate demand for and increase supply of clean vehicles and investigate biofuels
- **Improve** the efficiency of supply chains - rail electrification, switch some freight movements from road to rail and coastal shipping.

Electrification of the vehicle fleet, together with the integration of transport with land use planning, are critical strategies given the scale of the challenge we face and the limited time available. We've already seen substantial funding committed to electric vehicle (EV) subsidies, and the ERP will no doubt include a range of further regulatory and financial incentives to accelerate EV uptake as fast as possible. But integration of transport with land use planning will require a longer-term horizon, and much of what is possible will be shaped by the new legislative framework expected to emerge from the reform of the Resource Management Act 1991 (RMA).

The transport-land use integration challenge

The Government's ambitious reform programme aims to deliver three new statutes by late 2022 to implement the paradigm shift signalled by the Resource Management Review Panel (panel) that reported in 2020.²

The panel recommended a new system for environmental protection and resource management which focuses on delivery of outcomes through setting targets and non-negotiable limits to enhance, protect, restore and improve the natural and built environment.

Three core pieces of legislation will replace the RMA. Drafting of the Natural and Built Environments Act (NBA) is well advanced, with an early purpose and principles Exposure Draft released for comment in early 2021. The Strategic Planning Act (SPA) and a new Climate Adaptation Act (CAA) are following closely behind.

The NBA will provide for land use and set environmental limits and outcomes which then guide the development of regional spatial strategies under the SPA, while the CAA is proposed to specifically respond to the complex issues associated with managed retreat and funding of adaptation measures.

Where does a low-carbon land transport system fit into this new framework? The NBA Exposure Draft provides an early glimpse.

The panel recommended that emissions-reduction outcomes be included in the NBA purpose and principles, to ensure the promotion of land and resource use activities that will mitigate emissions or sequester carbon.

The NBA Exposure Draft at section 8 would deliver on that direct recommendation, as well as seeking urban form outcomes that support emissions reduction:

8. To assist in achieving the purpose of the Act, the national planning framework and all plans must promote the following environmental outcomes:
 - ...(j) greenhouse gas emissions are reduced and there is an increase in the removal of those gases from the atmosphere
 - (k) urban areas that are well-functioning and responsive to growth and other changes, including by—
 - (i) enabling a range of economic, social, and cultural activities; and
 - (ii) ensuring a resilient urban form with good transport links within and beyond the urban area.

Other provisions enable the proposed new national planning framework (NPF) to prescribe environmental limits and require it to include provisions "directing" the outcomes listed in section 8. The NPF can direct that provisions be given effect to through consolidated plans (replacing the current regional and district plans) or through new regional spatial strategies. In some cases, the NPF may provide for provisions to have direct legal effect without being incorporated into a plan or a regional spatial strategy.³

If these provisions survive the final drafting process, they will give the Minister for the Environment (who develops the NPF) extensive powers to mandate urgent, far-reaching land use and emissions control regulation.

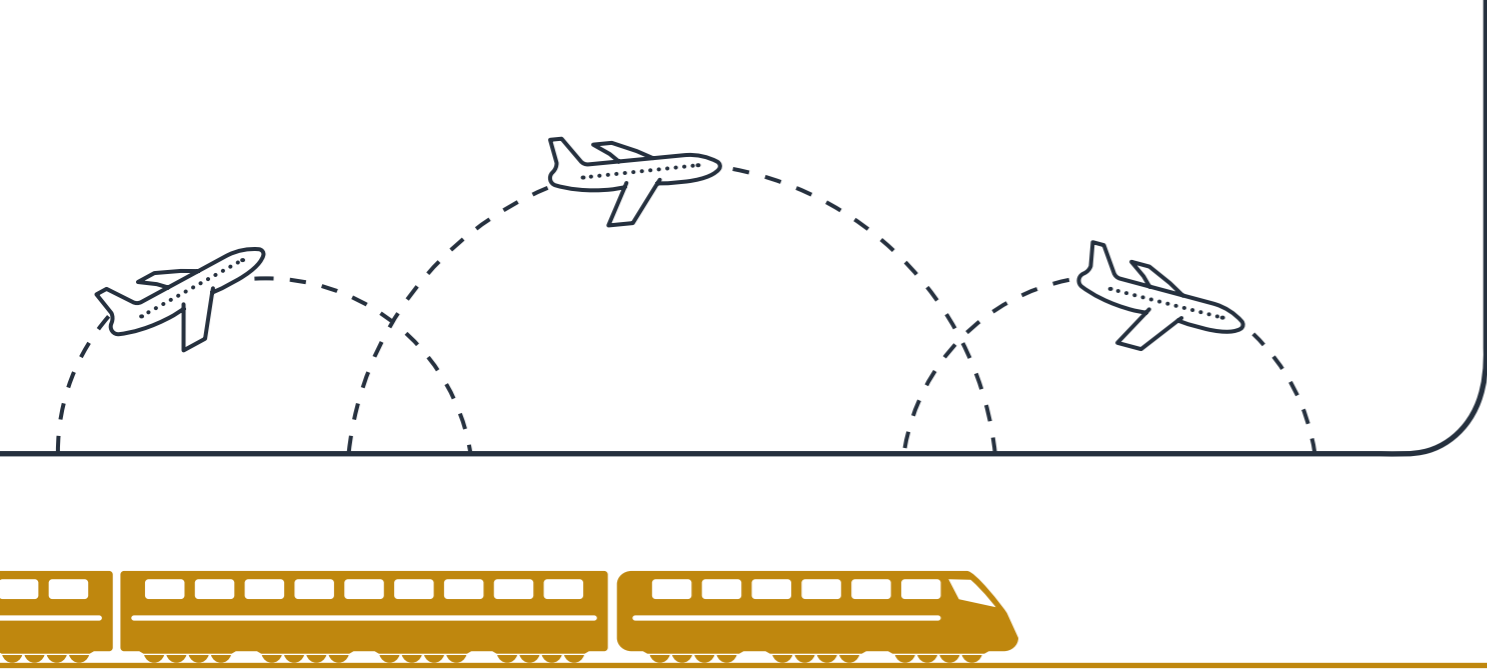
The key challenge is that, while the land transport system is dynamic, evolving in response to performance deficiencies and changing policy drivers, that evolution is the product of complex, lengthy processes that will not yield easily without further legislative change.

Whether for roads or climate-friendly modes such as shared use paths and rapid transit corridors, planning for land transport infrastructure commences with a Treasury-mandated business case process. These business cases

¹ Hikina te Kohupara - Kia mauri ora ai te iwi: Transport Emissions: Pathways to Net-zero by 2050 May 2021, Ministry of Transport

² Resource Management Review Panel New Directions for Resource Management in New Zealand (Ministry for the Environment, June 2020)

³ NBA Exposure Draft, section 15



identify network needs and build the case for investment by setting investment objectives, identifying constraints, developing corridor options, undertaking multi-criteria analyses, and ultimately selecting preferred alignments. Climate change resilience and low-emissions outcomes can be infused into this process, and there are signs that these factors are already influencing investment decisions.

The investment decision-making process occurs within the planning and funding cycle set up by the Land Transport Management Act 2003 (LTMA), with national and regional land transport plan processes identifying long-term priority funding requirements. Compelling business cases can wait years to have funding confirmed for identified priorities before moving into an implementation phase. Those priorities have already started to shift in the wake of clear commitments to low-carbon transition, but amendments to the LTMA may also be required to give greater impetus in the short to medium term.

The introduction of spatial planning under the SPA should also assist with transport and land-use integration.

Spatial planning as a concept seeks to make strategic, integrated decisions about a region's development.

Spatial planning is vision-driven, not issues-driven, and focuses on the 'where of things' rather than providing a development control rule book. For example, it will identify the broad pattern of existing and future urban development, areas that should be protected from development, areas that are subject to constraints (eg due to natural values or cultural importance), indicative future infrastructure corridors and opportunities to make better use of existing infrastructure networks. The regional spatial strategies developed under the SPA will be an important means of identifying climate change mitigation measures at a strategic level.

Each region is expected to undertake spatial planning (the process) and develop a regional spatial strategy (the output). Regional spatial strategies will be required to have a 30-year outlook, informed by longer-term data as appropriate, such as 100-year projections for climate change, and will also need to give effect to the environmental outcomes set out in section 8 (or its ultimate equivalent) of the NBA.

For land transport infrastructure, the benefit of a spatial planning lies not so much in where infrastructure corridors or locations are indicatively shown, but in the process of building consensus around the need for them and their

strategic importance.

Once everything is 'on the board', the key players are then able to agree relative priorities, and the work of integrating land transport networks for all modes with smart urban growth can begin in earnest.

This has never been more important; as we gather momentum towards a zero net carbon future, business case processes will need to ensure timely delivery of inputs to regional spatial plans, and infrastructure providers will need to lead and anticipate, rather than respond to, changing community priorities.

Meanwhile, how to assess emissions in a consenting process?

With its main focus on the vehicle fleet and land use/transport integration, the Climate Change Commission did not recommend any measures to influence emissions that are enabled by infrastructure. Until recently, the RMA expressly prevented decision-makers from considering the impacts on climate change of any greenhouse gas emissions generated by proposals seeking consent. That situation has now changed: the RMA has been amended so that, from 31 December 2021, the prohibition will no longer apply.⁴ The removal of section 104E

will create some uncertainty regarding the methodology of assessment to be applied to potential emissions for the purpose of obtaining consents or designations for land transport projects. The transition over time to a low emissions vehicle fleet, and EVs in particular, poses some complex challenges for effects assessment associated with enabled or induced carbon.

With its key role in prioritising investment in, and delivery of, transport infrastructure under the Government Policy Statement for Land Transport 2021, Waka Kotahi is developing a methodology for measuring construction, operational, enabled and end-of-life carbon emissions from the land transport system. Based on international best practice, the methodology is part of a broader workstream on emissions profiling within Toitu Te Taiao, the Waka Kotahi Sustainability Action Plan.⁵

“Once fully implemented, this methodology will be critical in helping us baseline our current land transport emissions, support our understanding of the transport contribution required to reach net-zero greenhouse gas emissions by 2050 and assist infrastructure decision-making to achieve required emissions reduction outcomes.”

This is already being used to guide Waka Kotahi project delivery and will be critical to preparing for the next phase of transition to a low carbon land transport system with completion of the RMA reform process.

The Climate Change Commission believes we are well-equipped to face the challenge:⁶

“We have demonstrated there are multiple ways to achieve our recommended emissions budgets. We have tested their sensitivity using a series of possible paths outlining different rates of technology and behaviour change to 2035. These show the budgets are flexible and resilient to unexpected change.”

...

“Our analysis shows the transition can begin in earnest. The technology and tools the country needs to get there exist today - Aotearoa does not need to rely on future technologies. The evidence has shown the transition is affordable, brings many other benefits, and opens up new economic opportunities. Our consultation demonstrated that the transition has broad support from people across Aotearoa.”

The land transport system has a critical role to play in our transition to a low-emissions, net-zero carbon future.

The impending reform of the statutory framework used to plan for, authorise and deliver transport projects has the potential to deliver real momentum to that transition.

Author: [Jennifer Caldwell](#)

⁴ Namely sections 70A and 104E will be repealed

⁵ Evaluating whole-of-life infrastructure carbon emissions, Hume, Marquardt & Lindberg, paper to Transportation 2021 Conference, May 2021

⁶ Climate Change Commission Final Report, Executive Summary

Will your bach or business be underwater in 100 years?



“To be able to plan and move forward, the new Act will need to give guidance on engagement with the community and decision-making regarding responses to coastal hazard risks for existing development.”

As climate change brings higher temperatures, rising sea levels and accelerated coastal erosion, tens of thousands of coastal homes and baches in New Zealand could be left at risk and uninsurable. Despite the best efforts of governments around the world to reduce emissions, the reality is that coastal hazards and the risk they pose to people, communities and the environment will remain a pressing issue.

In February 2021, the Government announced its intent to repeal and replace the Resource Management Act 1991 (RMA) with three new acts governing land and the environment. One of these acts is set to be the Climate Change Adaptation Act, which is signalled to address the complex issues associated with managed retreat from the coast, including the funding and financing of that process.

While the details of the proposed act are still under wraps, councils, businesses, and homeowners will be looking to the new legislation for greater certainty and direction on the longer-term risk management of coastal hazards for New Zealanders.

Internationally, many countries rely heavily on 'hard protection' structures to hold back the sea. The Netherlands have used sea walls for centuries, while Japan is currently building structures as high as 14 metres and 400 kilometres

in length to protect its coastal communities.

In New Zealand, hard protection is discouraged as a matter of national policy. The New Zealand Coastal Policy Statement 2010 (NZCPS) saw a shift in coastal hazard management away from hard protection toward promoting and encouraging alternative strategies.

The NZCPS requires local authorities to identify areas that could be affected by coastal hazards over at least 100 years. They must then implement a planning regime that avoids development or change in land use that increases the risk of harm and adverse effects from coastal hazards in these at-risk areas. At the same time, they are required to encourage any development or change in land use that reduces the risk.

While the NZCPS recognises that hard protection may be the only practical means of protecting significant existing infrastructure and built resources, other strategies are promoted.

There is strong policy support for protecting, restoring and enhancing natural defences that protect coastal land uses and sites of significant biodiversity, cultural, historic heritage or geological value. Natural defences can include beaches, wetlands, coastal vegetation and dunes. New Zealand has seen several initiatives to bolster natural defences including beach sand replenishment, sand dune protection,

and vegetation planting along the coast. There is no policy support at all for sea walls outside areas of significant existing development.

Adapt or managed retreat

In some locations, none of these strategies may be sufficient to protect homes, amenities and infrastructure, particularly in 100 years. Responses beyond protection mechanisms, such as adaptation or managed retreat, are options for existing development in hazard prone areas.

Adaptation involves making changes to ensure existing assets are more resilient to the risks posed by natural hazards. Examples include building on poles and stilts to lift floor levels, innovative flood-proofing solutions such as designs and materials that allow seawater to enter during a storm event and then drain naturally with no damage to the structure, or redirecting flood waters to avoid existing development.

Managed retreat is to remove or relocate existing development and infrastructure from at risk areas over time. As the policy direction is only to encourage managed retreat, there is significant uncertainty about whether managed retreat ought to be implemented and enforced at all.

It is also unclear who is responsible for making decisions, when managed retreat might be appropriate, what tools

are available to make managed retreat a reality, and ultimately who is to pay for everything that is involved in the process. Even then, we cannot simply relocate all existing communities, infrastructure and services to other locations.

Guidance in these areas will be essential in the new Act.

No new development in at-risk areas

If you are thinking about building a new holiday home on the beach, you might have to think again or plan for a longer walk to the sea. When it comes to new developments, the main thrust of the NZCPS is to locate new developments away from coastal hazard areas.

As desirable as that patch of land may be, if it is at risk within the next 100 years you may not be able to build there.

The NZCPS also presents challenges for our roading and three waters infrastructure which are often located in the coastal environment.

There are options that could enable new development in coastal areas while reducing the risk of harm and adverse effects from coastal hazards, but in some instances the relevant NZCPS directions are somewhat at odds. For example, reclamation could raise up new land along New Zealand's coasts to unlock land for development and

lower exposure to coastal hazard risk for existing developments.

While reclamation could reduce risk for both new and existing development, such an approach can be inconsistent with Policy 10 of the NZCPS which directs councils to avoid reclamations unless strict criteria can be satisfied. The high threshold set by the NZCPS means reclamation is unlikely to be an available option except in rare situations.

To be able to plan and move forward, the new Act will need to give guidance on engagement with the community and decision-making regarding responses to coastal hazard risks for existing development. It will need to identify the options that may be available to address coastal hazard risks and guidance as to when they may be appropriate.

When it comes to managed retreat, we need to see viable funding and compensation mechanisms. This includes qualifying criteria, a clear delineation of responsibility for funding and responsibility for the works.

Climate change is here. The threat to homes, property and infrastructure is real. Everyone affected is looking to the Government for direction on the next steps.

Authors: [Cedric Carranceja](#) and [Jenna Silcock](#)

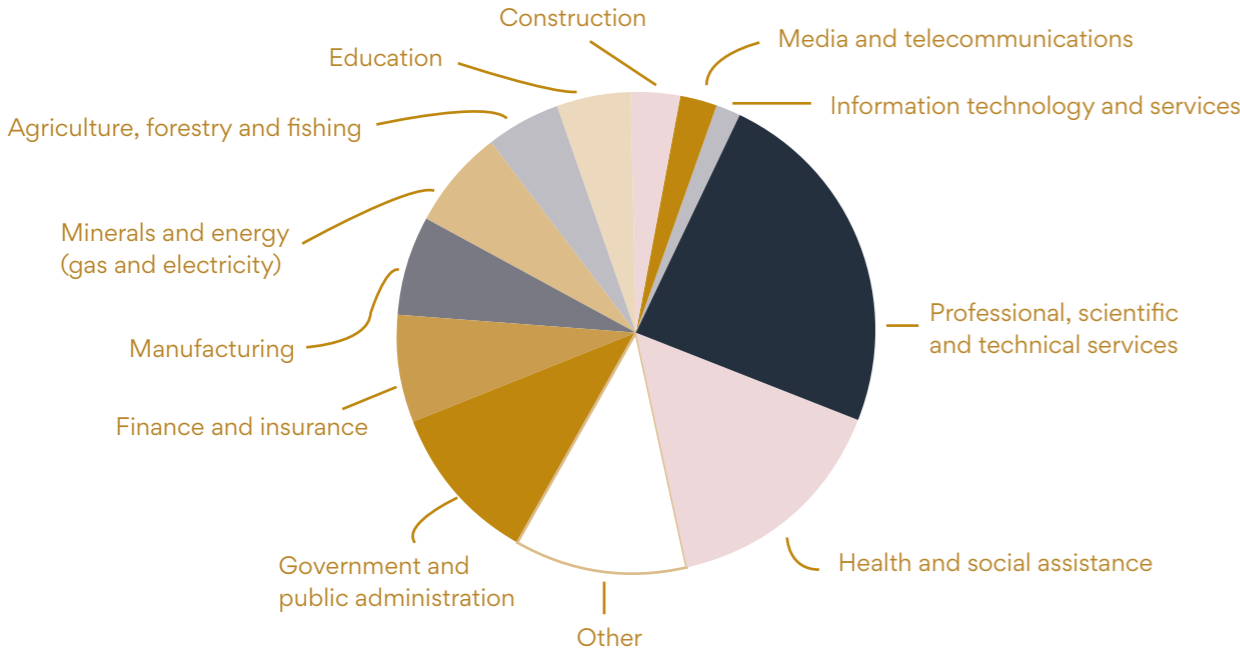


Appendix 1

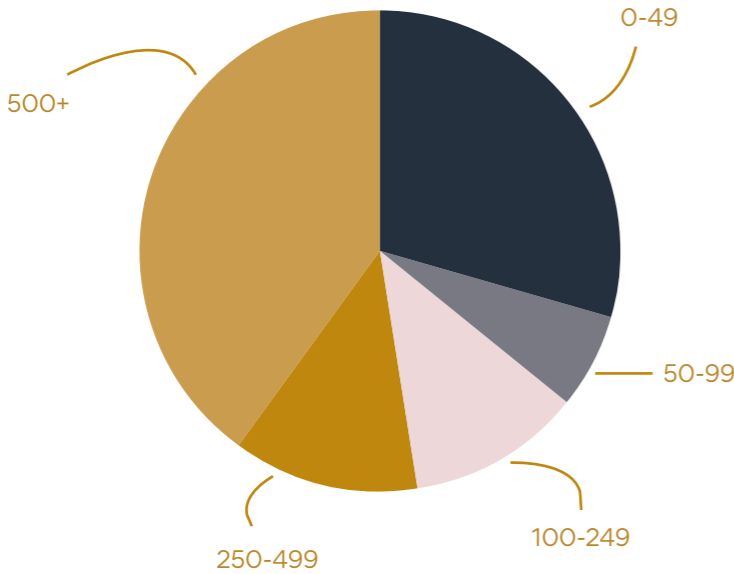
Survey - your thoughts on decarbonising infrastructure

The below statistics are from our findings in a survey the Buddle Findlay conducted asking clients and contacts to share their thoughts on New Zealand's decarbonisation status and asked input on what the priorities should be to move towards a low carbon economy.

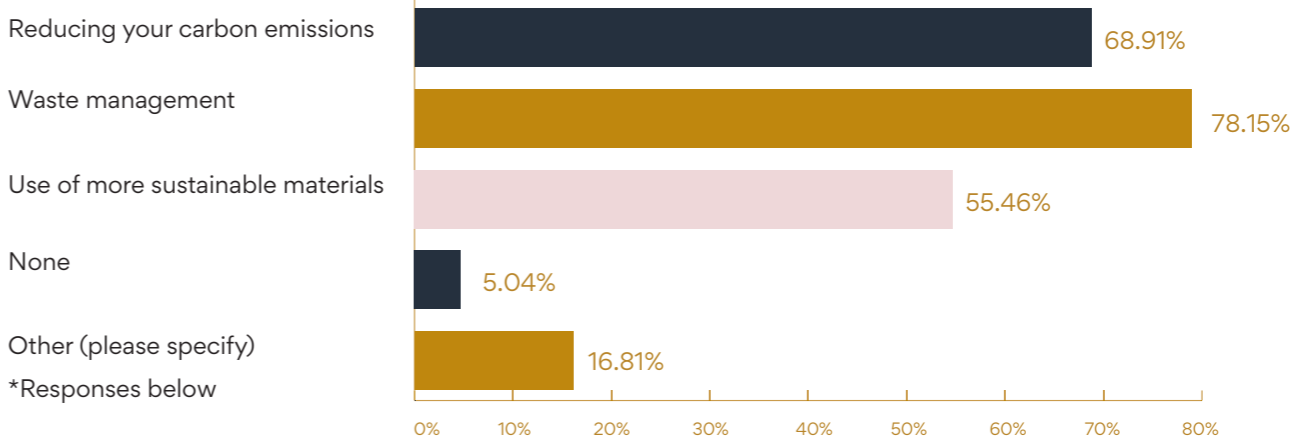
What industry do you work in?



How many employees does your organisation have?



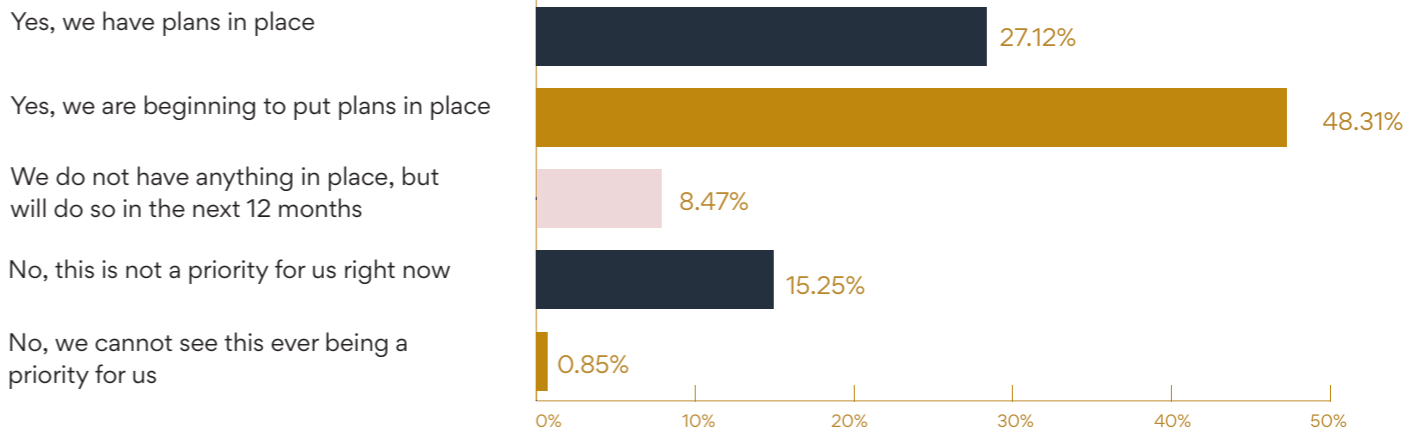
Which sustainability initiatives are you already prioritising within your company?



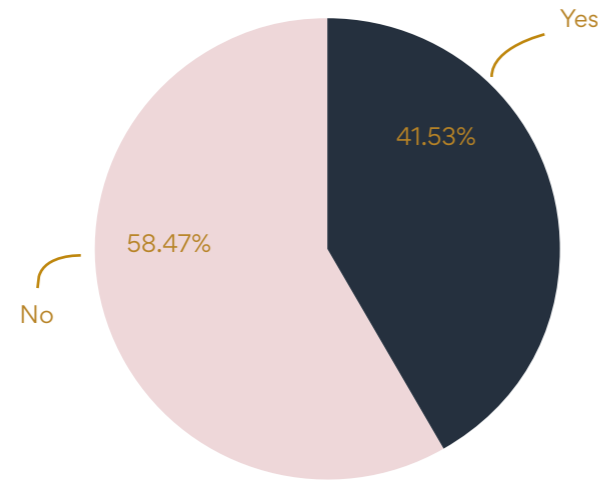
Other (please specify)

- Carbon calculations
- Breeding low methane sheep
- Afforestation
- Paperless, digital meetings rather than face to face
- Industry collaboration with a view to sharing data and policy ideas
- Leasing highly sustainable premises
- Reducing power consumption
- Reducing water usage in manufacturing
- Investment in low emission alternatives for the sector
- Helping our client with sustainable solutions
- Better travel, building performance
- Sus-linked loans and green loans
- Sustainable procurement policies
- No waste management available, no vehicles available for EV, so have to purchase petrol
- Sustainability science around foods and ecosystems
- Reducing carbon footprint inherent in our product (cars)
- Don't know
- Hiring and building internal capability to provide increased sustainability services to our clients
- General environmental 'do the right thing' stuff such as reducing water use, plastic use etc
- Solar power.

Are you taking action within your business to address climate change and towards net carbon-zero 2050?



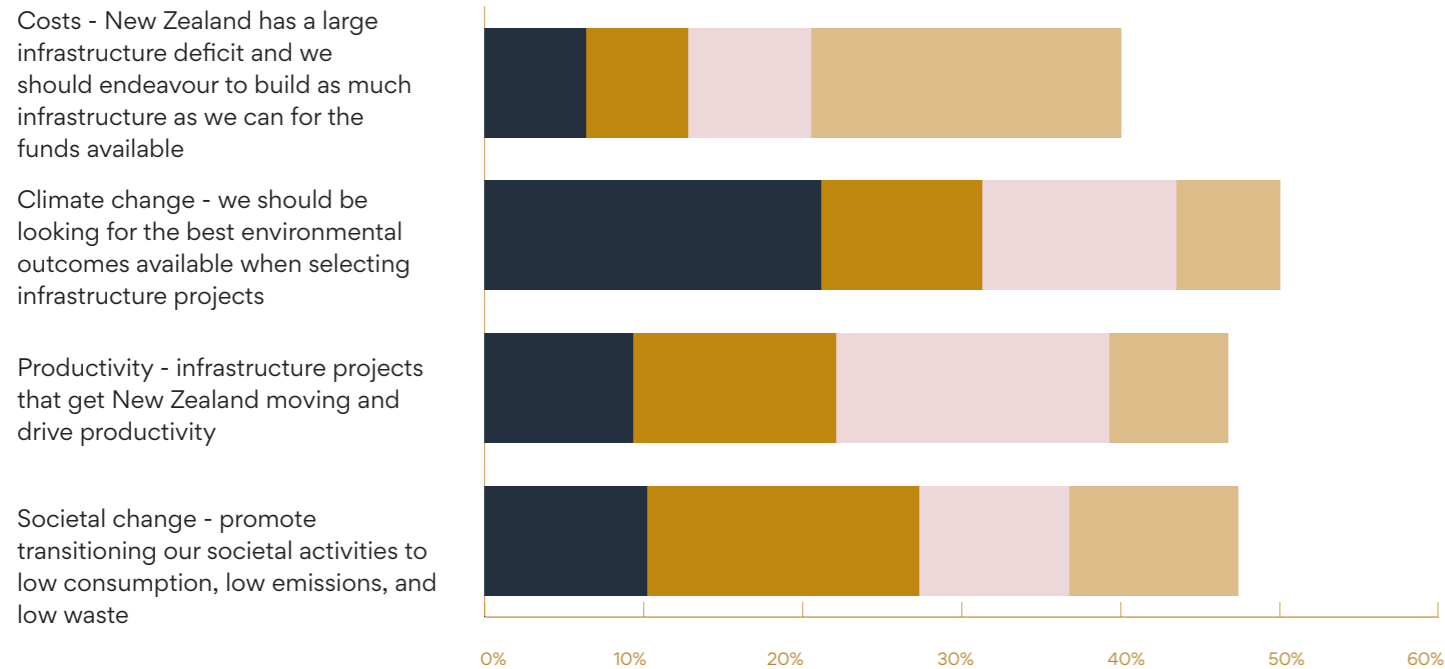
Have you read the Climate Change Commission report?



The delivery of low carbon infrastructure (infrastructure that generates fewer carbon emissions) often requires a trade-off between environmental impacts and other objectives.

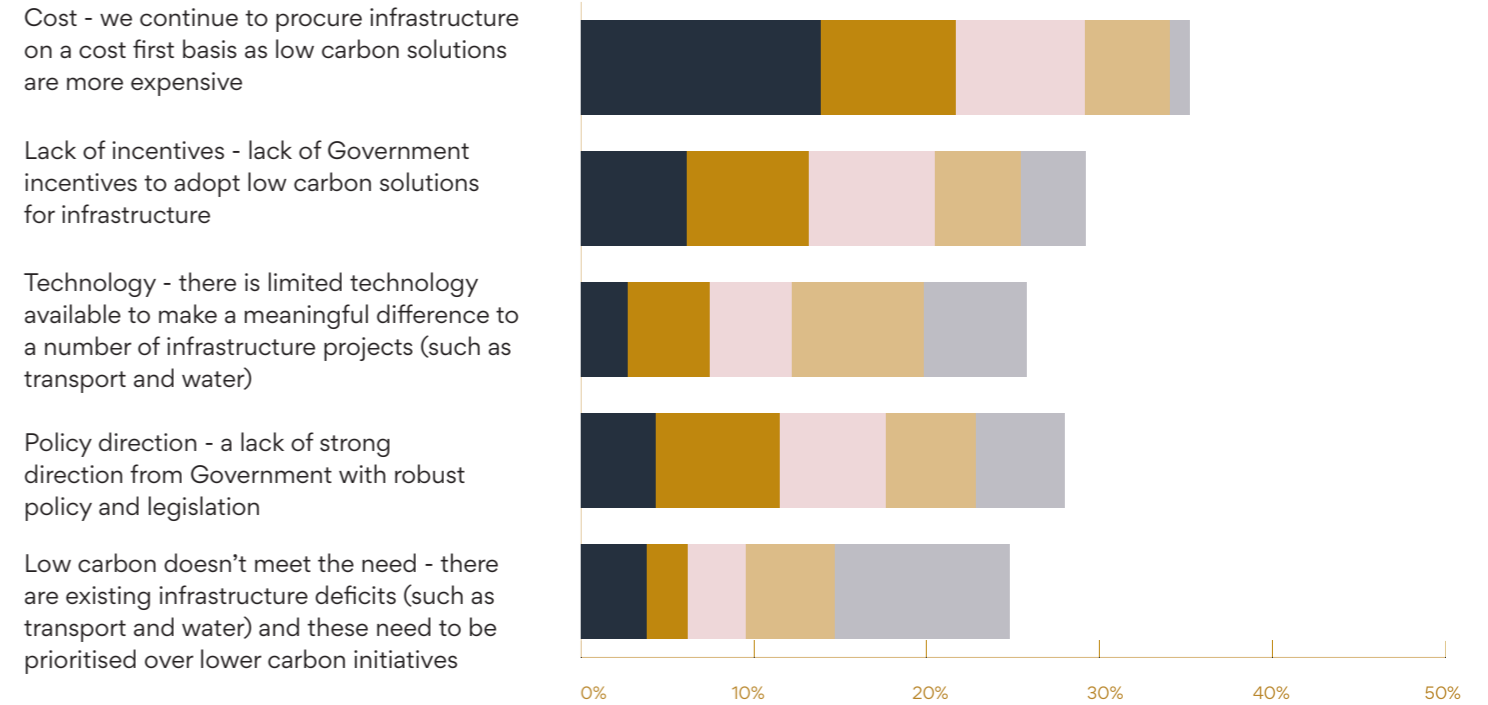
In the New Zealand context, what do you think should be prioritised when making decisions about infrastructure projects? Please rank your answers in order of priority.

Rank- (high priority) - Rank 4 (lowest priority)
Key: Rank 1 Rank 2 Rank 3 Rank 4

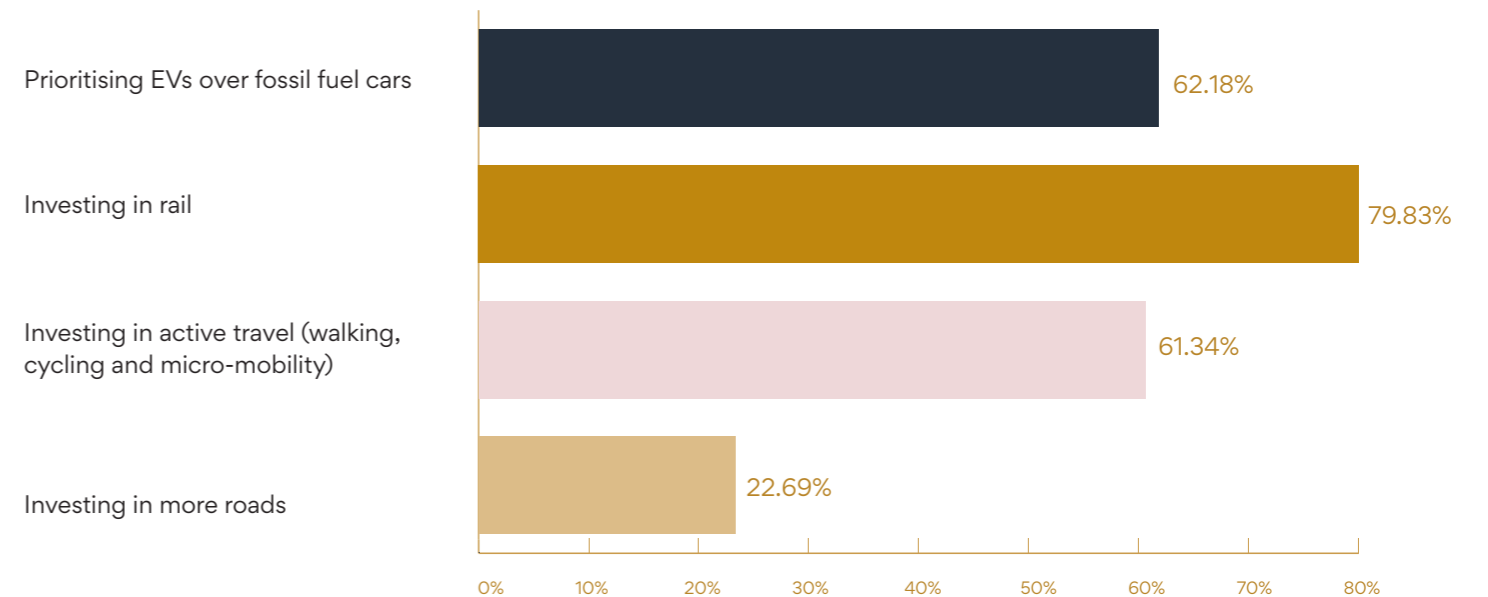


What do you consider to be the biggest obstacles to delivering low carbon infrastructure projects? Please rank your answers in order of priority.

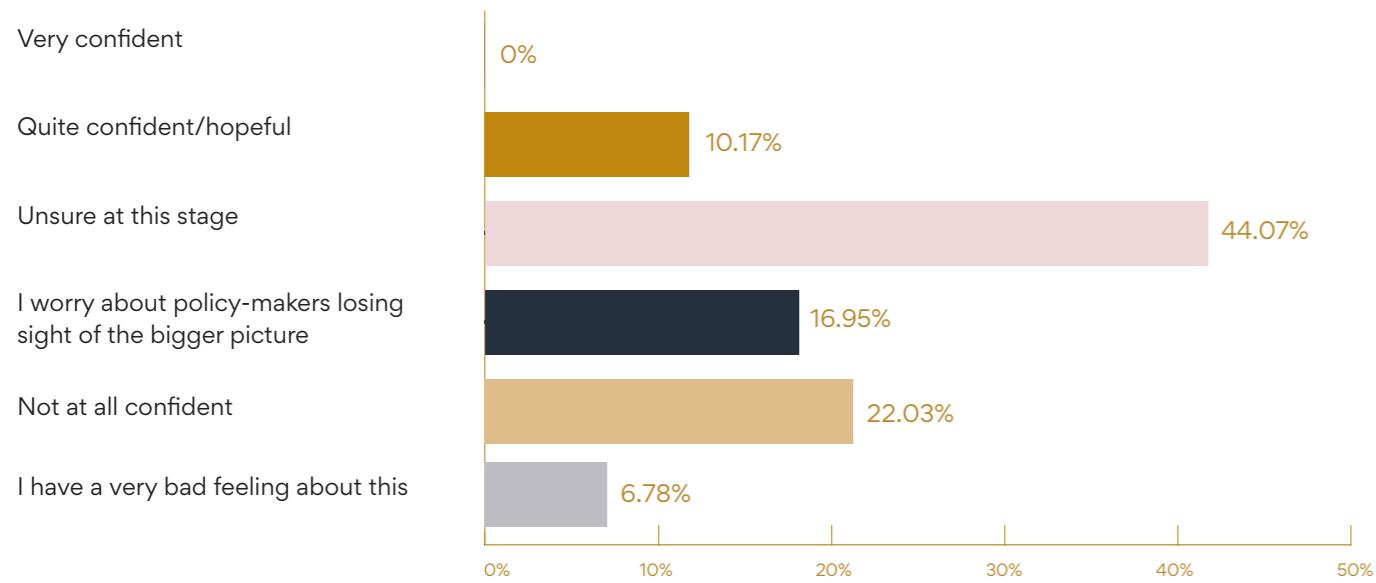
Rank- (high priority) - Rank 5 (lowest priority)
Key: Rank 1 Rank 2 Rank 3 Rank 4 Rank 5



What do you think the Government should prioritise when designing New Zealand's future transport needs? Select those that you agree with.



How confident are you that the new Acts to replace the RMA will support good outcomes in terms of a lower carbon economy?



Buddle Findlay certified as carbon neutral for 2019 and 2020

Buddle Findlay is now certified carbonzero. With the worldwide aim to avoid more than 1.5°C change in global temperature, Buddle Findlay is committed to playing its part in the effort to achieve net-zero emissions by 2050.



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