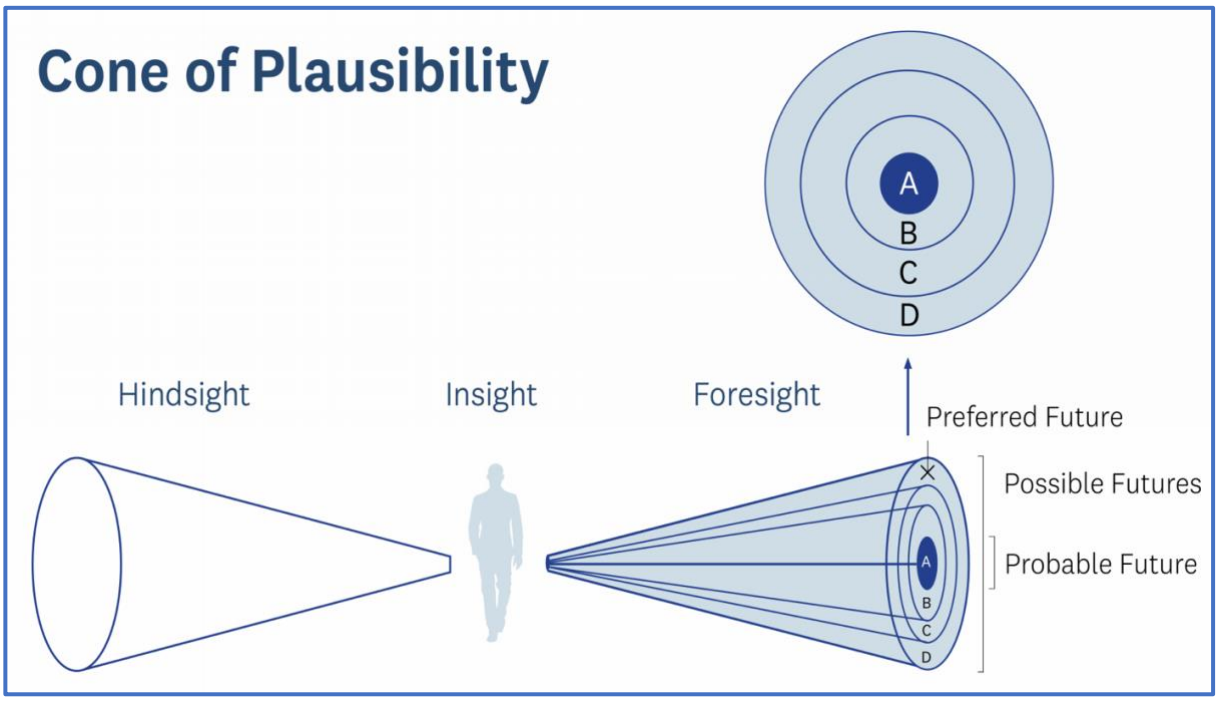


Submission

He Pou a Rangi Climate Change Commission 2021 Draft Advice for Consultation

March 2021

EXECUTIVE SUMMARY

The Institute welcomes the *2021Draft Advice for Consultation (Draft Advice).*

The Institute would like to acknowledge the clear and concise nature of the *Draft Advice*. The way the authors have structured the dense information and complex ideas is exemplary. The *Draft Advice* is very easy to read and well organised. This enabled our team to have a great deal of debate, gather our ideas and put forward a range of suggestions and high-level observations.

Thank you for making the consultation process easy to navigate; the difficult part was finding agreement amongst ourselves as to what institutions, instruments and information should be put in place to respond effectively to the grand challenge that climate change has become.

The submission is broken down into three parts, plus attachments.

Part 1 discusses what we have learned since operating in the long-term futures space, with a particular focus on the need for linkages and alignment between foresight, strategy and reporting and the trials and tribulations that exist in the climate change policy space.

Part 2 aims to respond to the six 'opinion' questions set by the Commissioners. These questions were difficult to respond to because the relevant research was not easy to find, read or have confidence in. Further, much of the research is not undertaken in New Zealand nor timely. Given this, we have attempted to answer these questions and rely on the evidence we have at hand. However, this exercise illustrated a significant lack of useful research in New Zealand, and the need to repeat research over time to show progress, i.e., what works and what does not. This becomes one of our recommendations – to build a stronger and more coherent research community and register of research material for current and future policy makers.

Part 3 briefly discusses a few specific questions of interest and study.

Parts 4 and 5 explain the Institute's next steps in terms of climate-related research and provides a few outstanding questions that the Commissioners and staff might like to reflect on as they complete their *Final Advice.*

Below we list seven high-level observations for consideration.

1. A low-emissions economy should not be the goal of the Climate Change Commission's work. In our view, a zero-carbon economy is the only moral goal for a developed country and the only legal goal for New Zealand (given the 'target for 2050' is zero 'other than biogenic methane', see s5Q of the Climate Change Response Act 2002).

2. The view that 'no emission reduction [is] too small' (found in Dr Rod Carr's 'Letter from the Chair'), in our opinion, is misguided and may act as an obstacle. The Climate Change Commission must show strategic leadership. This means identifying a wide range of public policy options that will deliver the biggest benefit for the people of New Zealand, and then working out ways of reducing the negative impact on those already challenged. In particular, the Commission needs to not only identify the big levers New Zealand can pull and when to pull them, but the levers *not* to pull (i.e. what not to focus on). The emphasis on small initiatives, although useful in terms of the team of 5 million, are not going to solve the grand structural challenges we face and may lead to confusion and a false sense of confidence in our own ability to individually bring about change.

3. The dominant narrative that emerges from the *Draft Advice* is that the transition must be 'achievable and affordable'. This narrative is based on assumptions that policymakers have made about the nature of the economy and the investment needed to achieve effective climate action. We believe such a narrative is likely to increase mitigation deterrence[1] as well as increase the public's expectations that such a pathway is possible. For example, 'achievable' implies an action is 100 percent feasible and 'affordable' implies that a solution can be bought. The commissioners need to use language carefully, so that New Zealanders understand the dilemma - that structural changes are required and that hard choices need to be made.

   Unfortunately, the assumptions and resulting narrative are likely to do little to deviate from the status quo and thus are unlikely to create the mandate required by decision makers, both in terms of the urgency and scale of change (as set out by international experts). International research and evidence demonstrate that there is a far greater need for dynamic innovation and faster action than what is proposed. Crucially, New Zealand must shift the overall narrative of climate action from one of 'cost' to one of 'opportunity' and 'responsibility'. Therefore, it is crucially important for the Commission's future advice to consider and include information on what investment options and opportunity costs are, not just about the implications for GDP.

   The Institute supports the need for faster upfront investment along with the urgent pace and scale of climate-related interventions. We believe these interventions would need to go beyond the proposed emissions budgets, the ETS or what is proposed in the *Draft Advice*.

4. The *Draft Advice* relies heavily on specific models without a lot of transparency or diversity (such as reviewing some of the dynamic and alternative internationally recognised models being explored by others). A more transparent and diverse approach would demonstrate New Zealand's commitment to best practice and illustrate a desire to seek out a wide range of expert advice. In the future, the Institute would prefer the Commission to set out clearly all the assumptions and limitations associated with the models used so that lessons can be learned, and advice tested (and therefore trusted). We also believe the Commission must be careful not to be solely dependent on a model or even a range of models; it is important not to create over-confidence in modelling, or a reliance on it.

   In addition, we believe the Commission should make clearer the distinction between climate models (which are mathematical representations of the Earth's climate system and aim to predict the climate) and scenarios (which aim to describe how the 'whole future' may develop). A simple way to make that clear is to add the word climate in front to create the term 'climate models'.

   Lastly, we believe it would be useful to develop New Zealand-based scenarios in order to explore New Zealand's unique structural and legislative ecosystem and to understand the linkages, identify the risks and opportunities and where possible, forward engage with emerging issues. Scenarios are not about projections, for example you would never complete

[1] For the purposes of this paper 'mitigation deterrence (MD)' is broadly defined as 'the prospect of reduced or delayed mitigation resulting from the introduction or consideration of another climate intervention'. (Markusson et al. 2018). See http://wp.lancs.ac.uk/amdeg/files/2018/11/Markusson-et-al-Towards_a_cultural_political_economy_of_mitigation_deterrence_by_negative_emissions_technologies_nets.pdf

> one scenario. Instead, futurists prepare a group of scenarios to explore the possible terrain; they aim to illustrate how the world might look and feel under certain constraints, tensions, technological developments or eventualities.

Overall, the Institute believes that the *Draft Advice* minimises climate-related risks (i.e., physical, financial and/or transitional risks) and overestimates the effectiveness of proposed solutions. A cautious and considered steward should have a low-risk appetite; this would mean ensuring an adequate buffer exists in case low probability high magnitude events occur and would not rely or build-in technological solutions not yet invented or tested. Prudence, discretion and a precautionary approach should drive the country's strategy, particularly when applied to a grand challenge the size, scale and complexity of climate change.

PART 1: WHAT WE HAVE LEARNED

The McGuinness Institute (the Institute) is an independent think tank based in Wellington, New Zealand. We undertake research and policy work with a particular focus on New Zealand's long-term future. Exploring the future is as much art than science.

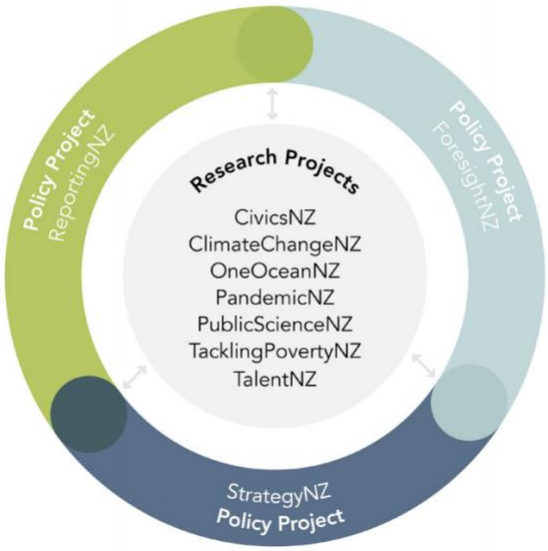
1.1 Our approach

The methodology that drives our work is shaped by the need to have an integrated, whole-system approach.

We believe that policy requires equal focus on foresight, strategy and reporting. Foresight drives strategy but is shaped by reporting. Strategy drives reporting but is shaped by foresight. Lastly, reporting drives foresight but is shaped by strategy. That is why we have three interlinking policy projects, one for each focus.

However, policy projects alone will not ensure we create value; we need to delve into complex problems in order to solve them. That is the role of our research projects. The diagram below shows how we see these two types of project; the Institute focuses on each research project, through the policy lenses of foresight, strategy and reporting. This way we can move between the specific and the general with relative ease.

You will note that one of the research projects relates directly to climate change. See our website page here.



The Institute is a strong advocate of the 'Cone of Plausibility' (see the cover of this submission). This means we aim to use foresight skills to explore possible futures before making decisions about preferred futures. This distinction is important. It is very easy in the climate change space to put all your energy into a preferred future without asking fundamental questions about the range of possible futures. We discuss this in more detail in Section 3.0 below.

1.2 About our Climate Change Project

In 2019, the Institute focused specifically on climate change. The overall aim of this project has been to explore a climate strategy for New Zealand. We hope to publish a Project 2058 report on climate change late in 2021 or early 2022.

David Attenborough recently stated in regard to climate change: 'My generation is no great example for understanding – we have done terrible things. If we are not making progress with young people we are done!' (April 2019). Our work programme aims to provide young people with a platform to enable them to amplify their thinking and have their voices heard.

Examples of past climate-related research include:

1. KiMuaNZ: Exploring Climate Futures workshop (July 2019)

The *KiMuaNZ* workshop brought together 40 young New Zealanders between the ages of 18 and 25 who have a connection with the Pacific. They shared experiences and understandings of climate change issues in order to develop different scenarios for New Zealand and our Pacific neighbours. We recommend viewing a video of the workshop here and reading the resulting booklet here. Most importantly, they shared their observations individually in the booklet.

2. Discussion Paper 2019/01 – The Climate Reporting Emergency: A New Zealand case study

This paper, found here, aimed to answer three research questions:

- What international protocols does New Zealand currently follow and to what extent do these protocols set standards or guidance for climate reporting? (See Section 7)
- How might international protocols be influenced or strengthened to improve climate reporting and how likely is it for an international climate reporting standard to be developed in the short term? This question assumes that New Zealand can influence the quality of climate reporting standards through consultation with the international standard-setters. (See Section 8)
- Given the current situation, what direct changes could New Zealand policy-makers and standard-setters make to improve climate reporting in New Zealand? This question assumes that New Zealand actively pursues other ways to strengthen climate reporting. (See Section 8)

3. Webinar with Mark Carney in conversation with Adrian Orr (Reserve Bank) and Hon James Shaw (May 2020)

On 28 May 2020, Simpson Grierson, Climate Disclosure Standards Board (CDSB) and the McGuinness Institute hosted a virtual roundtable discussion to hear the perspectives of some of the world's thought leaders on climate change and finance: Mark Carney (UN Special Envoy for Climate Action and Finance and former Governor of the Bank of England), Adrian Orr (Governor of the Reserve Bank of New Zealand) and James Shaw (Minister for Climate Change, Minister for Statistics and Associate Minister of Finance). They discussed rapid pathways to achieve New Zealand's transition to a low-carbon future, with a particular focus on the *Recommendations of the Task Force on Climate-related Financial Disclosures* (TCFD).

4. Presentations on Climate Change Reporting: How to prepare and report climate scenarios (Feb 2021) and Scenario Development (Mar 2021)

Auckland Council asked the Institute to present on how to prepare and report climate scenarios. The PowerPoint slides can be found here. This page also provides a later presentation (March

2021) to Victoria University that explores how to develop scenarios. Both are relevant in terms of the work of the Climate Change Commission.

1.3 Key lessons

Early this year, Wendy McGuinness gave a presentation to Auckland Council which outlined some key concerns and traps we have discovered while interpreting climate change research. We discuss some of these traps below.

1. The difference between 'data', 'information' and 'knowledge'

Data on its own does not create information; data becomes information only when data forms pattens (or not). In addition *information* on its own does not create knowledge, information only becomes knowledge when there is sufficient information to illustrate how the system works. Hence *knowledge* is not simply dependent on quality and timely data or relevant information – true knowledge evolves from understanding how a system operates dynamically (e.g. how it responds to new stimuli). Knowledge often comes from observing a system over a long period of time and is passed on from one generation to another. Climate change is relatively new and we are still very much at the data stage. We need to focus on the quality and timeliness of the data we have and to collect, sort and chronicle data for current and future generations – so that we can benchmark progress or what does not work.

2. The difference between 'strategy' and 'foresight'.

Strategy deals with the means to an end; it is hard work. It focuses on 'how' and the 'goal' – in particular how to reach the goal. *Foresight* is creative, playful and explorative and focuses on 'what if'. We find that, in the climate space, not enough effort is put into foresight.

3. The difference between 'probable futures', 'preferred futures' and 'possible futures'.

The Cone of Plausibility (on the cover) makes the distinctions clear. We find that, in the climate space, the narrative quickly goes to the preferred future and not enough time is spent on the possible futures. A trick that futurists talk about is the trap of talking yourself into a preferred future. Some futurists refuse to go into the preferred future space due to the way it creates bias and blind spots. Basically it can trap you into thinking only about the goal (and how to get there) and you fail to seek out new conflicting information that might make you change your goal or allow you to pivot to find an optimal position and in some cases better position from where you started. The risk in the climate space is that many people and communities have (or are in the process of) developing a preferred future (e.g. the status quo or a green utopia), when in practice we need to keep a very open and curious mind. We find in the climate space the tension arises because people are trapped in a preferred future. The Commission will need to work hard to focus the debate on probable and possible futures, particularly at this early stage of policy development.

4. The difference between 'probability' and 'magnitude'.

People tend to not take into account low-probability high-magnitude events. New Zealand has three of these in recent years: the Christchurch earthquakes, Whakaari / White Island and the terrorist attack. Some experts argue we are simply not wired to consider and prepare for low probability outcomes – the majority outcome tends to rule – even if we are dealing with something like a 60/40 ratio, we tend to plan for the 60 and forget the 40 percent chance exists.

This means we need to work hard to ensure that low-probability events are taken into consideration and uncertainty over those probabilities are at best – a broad estimate. We find in the climate space, we need to work hard to ensure ow-probability possibilities are discussed early in the process.

5. The difference between 'models' and 'scenarios'.

This distinction is important and is, in our view, leading to confusion in the climate change space.

- *Models* are about assumptions and tend to be financial in nature and identify probable outcomes. A model contains a great deal more logic and aims to be transparent. They are more science than art.
- *Scenarios* are explorative narratives that are, to a degree, made up. They are used to explore possible futures and are iterative – exploring connections and relationships as you move through the scenario. See our worksheet (Attachment 3) on how to develop climate change scenarios attached. They are more art than science.

Models often inform scenarios (they are an input) whereas scenarios can identify areas of study that might lead to new models or changes in assumptions of existing models. They can and often work together but they are tools that have very different purposes. We find that, in the climate space, people frequently mix up models and scenarios; for example in our view the IPCC scenarios are really models.[2]

In 2008, the Institute undertook some scenario work which used climate change and genetic modification as a way to explore the future: *Report 6 – Four Possible Futures for New Zealand in 2058 (updated April 2009).*[3] It includes some quite detailed timelines for each of the four scenarios: The journey from 2008 to 2058 – which might be of interest. To illustrate the difference between what a model can tell you verses a scenario – the lessons learnt from this scenario work identified the following things to watch – to indicate which of the four worlds we might be moving towards:

- A fortress mentality versus a desire to work with others, both between individuals and between countries.
- Disparities in wealth, health, education and technological adoption within societies and between countries.
- The type of leadership style, in particular whether it is proactive and forward thinking or complacent and reactive.
- The extent to which privacy and secrets are accepted norms in government, or whether transparency and public accountability are the more common ethic. (page 47)

Importantly, long-term strategies that rely on modelling alone can be severely flawed, and should be avoided because they fail to take into account low-probability events and fail to imagine how the timing of events bring about different outcomes. The Institute challenged 36 young people at a youth workshop to develop and design a card game that enabled people to learn that the timing of the card (how the cards are played) lead to major changes in

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2 See https://www.carbonbrief.org/explainer-the-high-emissions-rcp8-5-global-warming-scenario

3 See *Report 6 – Four Possible Futures for New Zealand in 2058 (2008 and 2009)* at https://www.mcguinnessinstitute.org/publications/project-2058/

outcomes.[4] We suggest that in the climate change space, scenarios have an important role to play and the Commission should create a space and place for scenario development.

6. The difference between 'types of research'.

Being clear about the different types of research available for the country to invest in will be important not just from an input perspective but also in terms of what gaps/opportunities exist that require further research. We define three different types of research below:

- Primary versus secondary research
  Primary research is gathering new data rather than relying on already existing data. *Secondary research* is where you are not the author and you have decided to rely on the work of others to build your knowledge. The Institute, for example, does a mixture of both primary and secondary research.

- Non-targeted (broad) research versus targeted research
  Targeted research is where a researcher focuses on a specific issue that has often emerged from broad research. *Non-targeted* is a grant or gift that enables the recipient to undertaken research without strings.

- Basic versus applied research
  Basic research (also called pure research or fundamental research), is driven by curiosity or interest in a scientific question. It aims to improve scientific theories and prediction of phenomena. It is a major means of generating new ideas, principles and theories and is often academic in nature. In contrast, *applied research* is designed to solve a specific practical problem, it is often commercial in nature rather than to acquire knowledge for knowledge's sake.

We find that, in the climate space, not enough effort is put into examining and differentiating between the different types of research that are needed. No one seems to be managing the research that currently exists or identifying research gaps. Instead, we are seeing technology-based silver-bullet solutions (applied targeted research) rather than social solutions.

As an example, we note that the *Draft Advice* mentions 'targeted research and development of technologies such as genetic engineering' – see excerpt below in Time-critical necessary action 4 (page 119).

> **1. Review current arrangements and develop a long-term plan for ~~targeted~~ research and development of technologies ~~(including evaluating the role of emerging technologies such as genetic engineering)~~ and practices to reduce biogenic emissions from agriculture.**

And progress indicators such as:

> **1. Government to have, by 31 December 2022, developed a long-term plan for funding research and development to support reductions in biological emissions from agriculture.**

[4] See https://www.mcguinnessinstitute.org/upcomingevents/workshops/foresightnz-workshop-2/

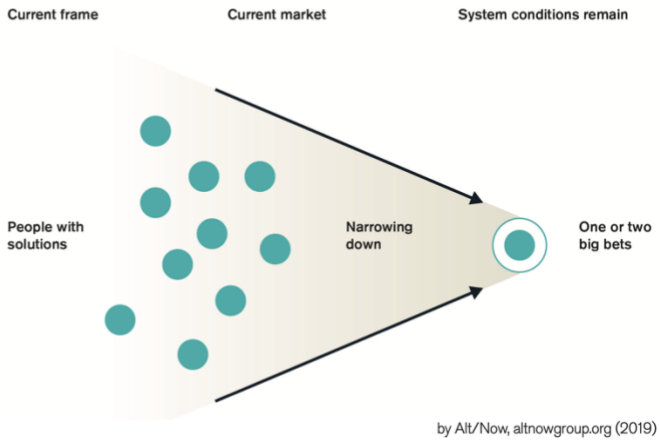
2. Government to have, by 31 December 2022, reviewed and amended processes and regulatory regimes for new emissions reducing technologies and practices.

The Institute was involved with the GM debate during the Royal Commission.[5] The narrative at that time was that the tool was the solution (i.e. a silver-bullet) and many scientists were keen to undertake GM research. Today we hear very little about GM and we would be concerned if the Commission reignites investing in a tool (for a tools sake) rather than investing in a desired outcome. The risk with the language used in the report is that researchers might focus on the tool rather than the outcome. So we suggest the removal of 'GM' and 'targeted' in 1 (as it is prescriptive). This will ensure a broader and wider exploration of the problem – and keep the focus on reducing biological emissions.

The Institute supports the mission-led approach being proposed by Mariana Mazzucato through her work on mission-orientated strategies.[6] Using her language, the grand challenge is climate change, one of the resulting missions is biogenic methane reduction and one of the projects to help achieve the mission is better research. We think the *Draft Advice* could easily be rewritten using this language and be so much stronger as a result.

We are also taken by this paper[7] and the resulting graphs it contains. It makes a distinction between two forms of innovation – Figure 3 shows the old model and Figure 4 is the new model and the one we are advocating – a more mission-led approach to innovation:

Figure 3: The funnel approach to venture development

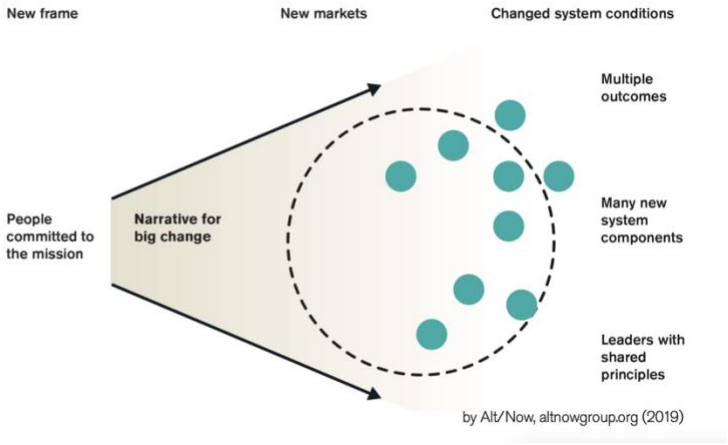


5 See *Report 16 – An Overview of Genetic Modification in New Zealand 1973-2013: The first forty years*, at https://www.mcguinnessinstitute.org/publications/project-2058/

6 See the Webinar Mission Aotearoa footage from 30 March 2021; the PowerPoint and video on our website event page, under Mission Aotearoa here: https://www.mcguinnessinstitute.org/mission-aotearoa-mapping-our-future To learn more about this approach, you may like to read the following papers here: Missions: A Beginner's Guide, Innovation Policy and Strategy for Post-COVID Economic Recovery, and Strategic Missions and Policy Opportunities for State-owned Enterprises

7 Image produced by Jennie Winhall, Alt Now 2019 for the policy paper "The Impact Entrepreneur: Building a New Platform for Economic Security in Work", Royal Society for the Encouragement of Arts, Manufacture and Commerce, Authors: Rowan Conway, Charles Leadbeater & Jennie Winhall. September 2019. https://www.thersa.org/globalassets/pdfs/reports/impact-entrepreneur-report.pdf

Figure 4: The amplifier approach to venture development



Our 2021 work programme

In 2021, we also hope to publish a number of research reports, including a *Project 2058* report on climate change.

The Institute is currently completing a series of working papers that we had hoped to include as part of this submission, however, due to unforeseen circumstances these will now be available in late April. The three working papers in this series are:

1. Working Paper 2021/01 – Timeline of Climate Change Institutions and Instruments since 1980. Note: We have attached a draft map to illustrate the type of work we are undertaking.
2. Working Paper 2021/02 – Tentative List of Government Department Strategies as at 31 December 2020
3. Working Paper 2021/03 – Analysis of Independent Bodies' responses to Climate Change
4. Working Paper 2021/04 – Reporting the off-shore mitigation costs of the Nationally Determined Contribution

Essentially, this series of three papers acts as our evidence base, which we will use to develop our thinking and recommendations in response to all of the climate-related work that is unfolding this year. The results will be brought together and published under a Project 2058 report. The series of papers will be in final draft by the end of April.

PART TWO: WHAT WE THINK: ANSWERS TO THE SIX BIG ISSUES

The 'six big issues' put forward by the commissioners generally call for an opinion rather than evidence. This means that although the goal has been to support our opinion with research, we have had to seek out and rely on international research – which means risks exist in terms of gaps in New Zealand research and risks in applying international research to New Zealand conditions.

This means there are risks that we do things 'that feel right' without understanding the true implications on current and future New Zealanders. So although we have some sympathy for the dilemma faced by the Commission, we also raise a red flag in terms of the inherent risks that such an approach will deliver. This observation simply reinforces the need for a stronger and more connected research community.

Given the above disclaimer, our answers to the six questions are as follows:

1. **Do you agree that the emissions budgets we have proposed would put Aotearoa on course to meet the 2050 emission targets?**

   No. The Institute believes that the two economy-wide models (your page 12) being relied upon are likely to be problematic. We have concerns over a lack of transparency over assumptions, that they may be unable to model non-linear dynamic change[8], and that a reliance on only two models could lead to errors. Further we have concerns that the international climate models are complex, and that New Zealand would need a high-level of expertise to recalibrate international models to align with New Zealand's unique environment.[9]

   Why is this important?
   Faulty models may result in action being deferred to later budget periods, may risk creating mitigation deterrence, and may limit opportunities for future generations. International evidence, research and literature are increasingly arguing for the application of new macro-economic modelling approaches for climate change policy and have moved away from CGE modeling.[10]

   Concerns over who is making the assumptions and setting the values
   Assumptions inform models, and models inform narratives and the subsequent actions taken. The dominant narrative that has emerged from the *Draft Advice* is that the transition is 'achievable and affordable', inferring some sort of sacrifice or cost that Aotearoa has the means to pay for. It is important to make explicit the limitations and biases that exist in this type of thinking. There is an evidence gap and, therefore, more research is needed to determine whether this narrative should more accurately be that the transition is 'an opportunity to improve economic activity' whilst also delivering on long-term wellbeing. In the Institute's opinion, Aotearoa must shift the overall sense of climate action from being

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8 Example of dynamic modelling https://www.theccc.org.uk/publication/sixth-carbon-budget/. See also Table 7 European Systemic Risk Board Analysis Working Group Sustainable finance project team report.

9 This comment comes from a conversation Wendy McGuinness had with an expert on Climate Change at LSE in 2019.

10 Computable general equilibrium (CGE) modelling 'is a globally popular analytical tool, recognised as the "gold standard" for informing policy formulation and analysis through scenario simulation.'. See https://www.nzae.org.nz/cge/what-is-cge-modelling/

seen as a 'cost' to being seen as an 'opportunity' and a 'responsibility'. Economic perceptions must also change. Shifting thought from a status quo-based economy to a more prosperous one will continue to grow the ability to get citizen engagement and buy-in to the transformative policies that will be needed. The work of ClimateKIC in the United Kingdom demonstrates methods of identifying and supporting the types of innovation required to realise a decarbonised and sustainable economy.[11]

It seems the assumptions which underpin the Commission's models focus on the pathway of economic growth and efficiency, and do not relate to more pragmatic international assumptions that avoid placing further burden onto future generations. Examples of this idea can be seen in the works of Mariana Mazzucato – which explore what smarter and cleaner directions of economic growth look like.

The dominant narrative of mitigation (i.e. emissions reduction + offsetting) is enforced by the assumptions, models and recommendations of this report. In the Institute's opinion, Aotearoa's current macroeconomic modelling limits the imagination of policymakers in relation to the role of innovation and new industries that could be critical to achieving a net zero economy. Instead, Aotearoa should focus on decarbonisation. To achieve such transformation and climate-resilience, the assumptions must focus on risk and opportunity instead of cost and benefit (i.e. growth and efficiency). This will enable public investment to shift focus to shaping markets rather than adjusting and solving market failures (as so well-articulated by Mariana Mazzucato). This type of thinking can be seen in the UK's sixth carbon budget.

Models reflect the assumptions made by the modellers. Therefore, arguably, policymakers are not imagining new industries, or else this would have been seen as an important assumption which would have been reflected in the model. More practically, perhaps the problem could be that policymakers do not feel like they have the permission or ability to include new industries in models. We need to get to the place where policymakers are doing the work required to imagine new futures and new industries. However, this must be a process that is inclusive of iwi and hapū, businesses and other citizens. There is a need to approach modelling inclusively to better understand the perspectives and impacts across society.

Concerns over what sits in and/or sits outside of the model

The Commission noted in its *Draft Advice* that:

> While our modelling is able to look at existing industries, there will also be **new industries** that arise as a result of the low emissions transition and from regional development that our modelling is not able to foresee. For example, there are opportunities to create new jobs associated with the circular economy, such as using wood waste for biofuels, and new industries, such as hydrogen. (Bold added] (page 95)

This raises the question of whether it is appropriate to use a model to consider new industries? Given the high likelihood that new industries will play a role in the economy in 2050, or potentially earlier, the question that follows is: why were new industries not included in the modelling, and how we can get to a position where they are? This is often referred to as structural economic change.

[11] WHAT IS EIT CLIMATE-KIC? https://www.climate-kic.org/who-we-are/what-is-climate-kic/

We need to break away from linear or equilibrium based economic modelling to enable this. Research demonstrates that again, dynamic or agent-based models are seen by many as the most appropriate way to model and understand structural economic change.

Concerns over what economic options are modelled
An example of this is regenerative agriculture. Whilst there are significant uncertainties regarding this approach, it may be useful for the Climate Change Commission to model the widespread adoption of this approach, given its potential to reduce emissions significantly? Given the competitiveness challenges to the meat and dairy sector from alternative proteins (such as cell-based agriculture) that are largely produced offshore, it may be worth exploring models where Aotearoa tries to aggressively compete globally through significant investment?

Concerns over what emission accounting frameworks are modelled
The Institute believes that the Commission should revisit the evidence presented in the PCE's 2019 Farms, forest and fossil fuels report, and consider splitting out negative emissions from gross in its reporting or, at a minimum, presenting these different scenarios.[12]

Concerns over two few economic models
Over reliance on models and modelling is a well-known risk.

Concerns over a lack of scenarios
Scenarios should feed into the models and the models should feed into scenarios – they should work alongside each other to help test and inform decision-making. It appears as though no scenario work has yet to be completed by the Commission. Our view this adds a further risk and a missed opportunity.

2. **Do you agree we have struck a fair balance between requiring the current generation to take action, and leaving future generations to do more work to meet the 2050 target and beyond?**

No. We believe the recommendations are likely to place an unfair burden on future generations. This is because the recommendations seem optimistic in terms of what they can deliver and there is little in terms of a buffer against unforeseen circumstances.

Policymakers seem to lag materially behind the expectations of Ministers. The analysis of government department strategies (GDSs) found low levels of climate change action articulated within existing strategies. See the discussion in Attachment 4. Although this research is still in progress, it is clear there is very little discourse on trade-offs between generations or possible impacts on current or future New Zealanders, or indeed an understanding that the economy needs to pivot in order to reach the 2050 target.

[12] 'Farms, forests and fossil fuels: The next great landscape transformation?', Parliamentary Commissioner for the Environment, 2019 https://www.pce.parliament.nz/publications/farms-forests-and-fossil-fuels-the-next-great-landscape-transformation

3. **Do you agree with the changes we have suggested to make the NDC compatible with the 1.5C goal?**

No. As outlined in answer to questions 1 and 2, the Institute believes that more ambition, urgency and effort is required to ensure Aotearoa not only contributes but contributes in a timely, effective and moral manner. New Zealand is a small, agile and wealthy country – we must work harder to be the example. Further, COVID-19 has decimated many countries around the world, which further places a moral pressure on New Zealand and New Zealanders to lift our game.

It is unclear whether the suggested changes to the NDC will be enough to be compatible with the 1.5C goal (while also ensuring that mitigation deterrence is avoided). The Institute believes that the suggested changes lack foresight, alternative modelling and scenario development. The Commission should consider reviewing the scenario work developed by the Productivity Commission as part of the 2018 Low-emissions economy report. These scenarios "vary in the extent and type of technology changes that reduce emissions, and the impact of those changes on the structure of the economy".[13]

We do not support the buying of international carbon credits in 2030, to in effect balance the books. Instead, we believe we need to react and change our behaviour now. The buying of carbon credits in 2030 is in reality a 'fine for bad behaviour'. We would prefer to see those funds remain in New Zealand, even if this meant paying dairy farmers not to farm cattle (and therefore not to pollute the atmosphere). It is possible we are already too late to develop and implement technological solutions. We must socialise this liability though better reporting (see Attachment 1), explore scenarios (Attachment 3), define a range of policy solutions and model what these solutions might deliver.

4. **Do you agree with our approach to meet the 2050 target that prioritises growing new native forests to provide a long-term store of carbon?**

No. Although we understand why this is an attractive option in that no key player will complain, the reality is that it leads to mitigation deterrence – it does not address the core of the issue nor structural or systems emission reduction. Policymakers need to be pragmatic and understand that offsetting and carbon capture through forests is a short-term fix and simply passes on an even bigger problem to future generations. Priority of investment should be given to active system change and dynamic innovation – this should be funded through ETS hypothecation (discussed further in Q6).

If growing native forests is going to be progressed, it should be done so in such a way that provides nature-based solutions[14] and strengthens biodiversity – where long-term carbon storage is a positive externality rather than the sole purpose of short-term sequestration. In

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13 'Low-emissions economy' Productivity Commission, 2018 https://www.productivity.govt.nz/assets/Documents/4e01d69a83/Productivity-Commission_Low-emissions-economy_Final-Report.pdf

14 Nature-based Solutions (NbS) are defined by IUCN as 'actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits'. See https://www.iucn.org/commissions/commission-ecosystem-management/our-work/nature-based-solutions

this regard, we support the uptake by the Commission of evidence raised in the 2019 PCE report and, in particular, the advice from Dr Edward Hearnshaw, who recommended:[15]

- Develop two separate targets for the second half of the century: a zero-gross target for fossil emissions, and a reduction target for biological emissions based on the advice of the new Climate Commission.
- Allow access to forest sinks as offsets only for biological emissions.
- Develop the tools needed to manage biological sources and sinks with a landscape approach that embraces water, soil and biodiversity objectives.

5. What are the most urgent policy interventions needed to help meet our emissions budgets?

The most urgent policy intervention is investment to amplify innovation and system transformation – moving from the funnel approach to the amplifier approach (see Figures 3 and 4 earlier).

New Zealand must invest in ways that effectively decarbonise our economy. A logical starting point toward decarbonisation would be to shift away from the systemic dominance of private vehicles toward more considered and innovative mass transit modes of transportation (e.g., fast rail, rail freight and improved urban form) and promote intensive city living. The following recommendations could be implemented in the short-term to develop momentum in this regard:

1. Action a Climate Vote (there are strengths and weaknesses to this approach, but given the urgency we support this idea)
2. Clear guidance on national priorities (see Footnote 22)
3. Conditionality of investment (e.g. sustainable procurement).[16]
4. Improved access and government commitment to sustainable finance.[17]
5. Public sector reporting on climate-related financial disclosures.[18]
6. Implement ETS hypothecation for use in emission reduction programmes or returned to the public as targeted subsidies or grants.
7. Require parties building properties over a certain size to quantify carbon that will be used in the building and to explain what practices they have implemented to reduce carbon emissions. These reports could go to the relevant Council, Climate Change Commission or even the Infrastructure Commission – so that we learn by doing.
8. Create incentives/improve alignment that brings about an increase in intensive, green and vital urban living by provide additional funding to local councils that have a certain level of intensity to support services back into those areas (e.g. parks, festivals etc) – so that we reward good behaviour.

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15 See https://www.pce.parliament.nz/publications/farms-forests-and-fossil-fuels-the-next-great-landscape-transformation

16 Socialising the risks and rewards of public investments: Economic, policy and legal issues. https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/socialising_risks_and_rewards_final.pdf

17 'World Economic Outlook, October 2020: A Long and Difficult Ascent', International Monetary Fund, 2020, https://www.imf.org/en/Publications/WEO/Issues/2020/09/30/world-economic-outlook-october-2020

18 Climate Change Response Act 2002 https://www.legislation.govt.nz/act/public/2002/0040/latest/DLM158584.html

The Commissioners appear not to have taken on board the challenge that the Intergovernmental Panel on Climate Change (IPCC) has set out, namely, to undertake rapid, far-reaching and unprecedented transformation of socio-technical systems. Instead, the *Draft Advice* seems to have taken a more reductionist approach such as 'reducing emissions' or 'developing targeted technological solutions'. Organisations such as Climate-KIC are developing new instruments and ideas such as 'transformational capital'. These new approaches take a complex systems perspective and align more with the Living Standards Framework rather than say GDP.[19] We believe we need to be more experimental in the social and environmental areas and were possible build linkages through the system so that bad behaviour leads to penalties or a loss of social license and good behaviour leads to applaud and a stronger social license.

6. **Do you think our proposed emissions budgets and path to 2035 are both ambitious and achievable considering the potential for future behaviour and technology changes in the next 15 years?**

No, as explained earlier the Institute believes that faster and more urgent ambition is needed, and that there is a significant risk to future generations if action is deferred.

Behavioural and technological change is dependent on system change. Aotearoa requires more ambitious and dynamic innovation in order to be able to pivot. There must be serious consideration toward the exploration and implementation of nature-based solutions moving forward. Climate-resilience must be holistic and should not solely rely on technological innovation. Robust natural systems must be treated as a critical component. This type of thinking aligns with the UK's Sixth Carbon Budget.[20]

The achievability of the proposed emissions budgets (plus further required technological and innovative change) is highly dependent on significant investment. To this end, the Institute recommends that such projects should be funded through ETS hypothecation. The auction of emission units in the ETS will generate an estimated $2.5 billion for government over the next five years. In contrast to New Zealand, the majority of emission pricing revenue around the world is set aside for use in emission reduction programmes or returned to the public as targeted subsidies or grants.

Government already relies on hypothecation to pay for other long-term priorities, why not climate change? The National Land Transport Fund, which pays for the National Land Transport Programme of infrastructure spending, is made up of revenue collected from fuel excise, road user charges, vehicle registration, licensing and tolls on roads. ETS revenues, through hypothecation, should be set aside in long-term climate programmes and managed by agencies or spent annually at budget time. Examples of potential uses for ETS revenues include:

- extending existing programmes such as the State Sector Decarbonisation and Government Investment in Decarbonising Industry funds, or
- establishing new programmes to subsidise electric vehicle purchases, paying for public transport infrastructure or funding low-carbon research.

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19 'Transformation Capital: Systemic Investing for Sustainability', Climate-KIC, 2020, https://www.climate-kic.org/wp-content/uploads/2020/08/Transformation-Capital-Systemic-Investing-for-Sustainability.pdf

20 'Sixth Carbon Budget' Climate Change Committee, 2020, https://www.theccc.org.uk/publication/sixth-carbon-budget/

Significant work has already been done by the Ministry for the Environment on scoping out and socialising a hypothecation regime in Aotearoa. This work should be finalised, with a first batch of investments ready to be announced alongside the release of the Emission Reduction Plan.

PART THREE: SPECIAL QUESTIONS

Although there are many specific questions we would like to have had time to answer, we have selected the following three which we consider deserve an immediate response.

Consultation question 6: Coordinate efforts to address climate change across government:
Do you support enabling recommendation 2 [Break down of emissions budgets]: Is there anything we should change and why? – p. 40

Attachment 4: Government Department Strategies Index 2020 Preliminary Analysis sets out the preliminary research after reviewing the content of 2020 government department strategies in operation as at 31 December 2020.

While there has been some improvement in the mention of climate change strategy, the level of change indicates that there is currently not enough momentum in the public service to engage with climate change and deliver meaningful outcomes in order for New Zealand to achieve on our 2050 target. More work must be done by Ministers to ensure the public service consider climate change when preparing and publishing strategies. Solutions to this should be explored in the *Final Advice*. The Institute would be happy to explore these solutions at a time that is appropriate to the commissioners or the staff. Here are a few ideas.

1. Ask Ministers to require all 202 GDSs to be reviewed by department staff to ensure climate change is taken into account – and republish accordingly.
2. Ask Ministers to require all heads of departments to write a strategy document describing how they are embedding climate change considerations and actions across all their roles and functions. There are clearly two aspects: What they are doing in terms of their own footprint (internal) and what they are doing to propel New Zealand forward (external). From our understanding there is work that is being undertaken with an internally perspective, but as indicated by the GDSs, the energy and foresight to drive the wider systems change required is missing. The GDS are shown in the 2020 strategy wheel at the end of Attachment 4 and each 2020 GDS can be found on our website here.[21]

Consultation question 12: Our path to meeting the budgets
Do you support the overall path that we have proposed to meet the first three budgets? Is there anything we should change, and why? – p. 70

We are unsure whether we have all the correct instruments and institutions in place. Attachment 2: Timeline of Climate Change Institutions and Instruments since 1980 (Draft), aims to provide clarity over where we have come from and where we might need to go. It makes clear that gaps do exist and will need to be required. For example:

- A new institution is needed to chronicle and make available New Zealand research.
- A new institution is needed to improve native plantation.
- A new instrument to record and support the cost of off-shore mitigation on an annual basis.

[21] See https://www.mcguinnessinstitute.org/policy-projects/strategynz/gdsindex/

- Scenarios need to be developed. See for example, Attachment 3: TCFD 'Strategy Exercise'.

Consultation question 23: Do you support our recommendations on reporting on and meeting the NDC? Is there anything we should change, and why? – p. 166

The Institute considers it is time for the liability to be reflected in the financial accounts of government. To this end we are currently preparing a working paper – see our OIA to the New Zealand Treasury on disclosure of the cost of off-shore mitigation (attached). This working paper aims to provide a wider context that might help the Commission make draw some conclusions to Question 23.

PART FOUR: NEXT STEPS

The Institute hopes to complete the following five working papers by mid-May. We would appreciate the opportunity to meet with the Commissioners and/or staff to discuss this research before they are published.

1. Working Paper 2021/01 – Timeline of Climate Change Institutions and Instruments since 1980

2. Working Paper 2021/02 – Tentative List of Government Department Strategies as at 31 December 2020

3. Working Paper 2021/03 – Analysis of Independent Bodies' responses to Climate Change

4. Working Paper 2021/04 – Reporting the off-shore mitigation costs of the Nationally Determined Contribution

5. Working Paper 2021/05 – National priorities of the New Zealand Government from 2006 to 2021[22]

[22] This working paper aims to update of an earlier piece of work. See Appendix 2 of https://www.mcguinnessinstitute.org/wp-content/uploads/2016/08/20150401-Working-Paper-201402-Web.pdf

PART FIVE: REFLECTIONS

The Institute would like the Commission to consider the following questions before finalising their advice:

1. Can the influence of mitigation deterrence be empirically demonstrated as a consequence of allowing offsets under the ETS? If yes, what does that tell you about your *Final Advice*.

2. Are we designing policies to manage distributional impacts or are we just doing analysis to understand the distributional impacts of policies we have already designed?

3. Is the Commission at risk of trying to be everything to everyone or could it suggest/create a space and place for another organisation – so that the Commission can focus on meeting its specific obligations under the Climate Change Response Act 2002?

4. What instruments and institutions are required to ensure your *Final Advice* can be measured and verified?

5. Does the *Final Advice* ensure the polluter pays, and if not why not?

6. If your advice was implemented, would New Zealand still need to purchase carbon credits in 2030 to meet our NDC obligations?

7. Do you believe the NDC target (to reduce greenhouse gas emissions by 30 per cent below 2005 levels by 2030) and the resulting budget is well understood by the general public? If not, what could be put in place to ensure the implications of failing to meet the resulting budget are understood by most New Zealanders?

8. What is the Commission's risk appetite? Is there an adequate buffer? Is there a contingency plan?

9. What is the impact if your *Final Advice* is wrong?

Thank you for your interest in our work. If you have any questions or queries, please do not hesitate to contact us.

We will forward our primary research, being our four Working Papers mentioned above, in late April.

ATTACHMENTS

Attachment 1: OIA to the New Zealand Treasury on disclosure of the cost of off-shore mitigation

Attachment 2: Timeline of Climate Change Institutions and Instruments since 1980 (Draft)

Attachment 3: TCFD 'Strategy Exercise'

Attachment 4: Government Department Strategies Index 2020 Preliminary Analysis

Attachment 1: OIA to the New Zealand Treasury on disclosure of the cost of off-shore mitigation

Subject: Disclosure of the cost of off-shore mitigation of the Nationally Determined Contribution (Our OIA 2021/09)

Attention: Dr Caralee McLiesh

Dear Caralee,

Disclosure of the cost of off-shore mitigation of the Nationally Determined Contribution (Our OIA 2021/09)

The McGuiness Institute has read and prepared a submission in response to the Climate Change Commission's *2021 Draft Advice for Consultation*.

We are in the process of completing a working paper exploring how to report the emerging off-shore mitigation costs in a transparent manner through the existing financial reporting framework. The working title is: *Working Paper 2021/04: Reporting the off-shore mitigation costs of the Nationally Determined Contribution.* To this end, we have included below excerpts from the *Draft Advice* that are relevant to this OIA overleaf:

The Institute strongly advocates the TCFD reporting framework and for the New Zealand Treasury (in addition to publishing a whole-of-government set of financial statements) to also produce a whole-of-government annual report. This is normal practice for entities that have a public good disclosure requirement (e.g. NZX listed companies).

We suggest the potential cost of off-shore mitigation now deserves to, at least, be a note in the financial statements, as it is now less than 10 years away. To not include it, in our view, would not be in the public interest. We also suggest the annual report should disclose climate-related financial disclosures in the form of a full TCFD report.

To help us complete the working paper, we would appreciate answers to the following questions:

1. Is the New Zealand Treasury considering publishing a TCFD report for the New Zealand Treasury? Please explain with reasons.

2. Is the New Zealand Treasury considering publishing a TCFD report for the whole-of-government? Please explain with reasons.

3. Is the New Zealand Treasury considering publishing an annual report for the whole-of-government? Please explain with reasons.

4. Is the New Zealand Treasury considering publishing a note or placing a liability in the financial report for the whole-of-government on the emerging cost of off-shore emissions mitigation? Please explain with reasons. Our working paper explores the accounting-related reasons for why this approach is necessary (given existing financial reporting standards). We focus in particular on materiality and prudence.

5. Is it correct to interpret the liability (as outlined in Table 8.4 of the Climate Change Commission's *Draft Advice*) as being 564mt CO_2e x $10b (between 5.8b and 11.5b). If yes, would this mean a liability of approximately $564,000,000,000? Can you provide the range of liability the New Zealand Treasury estimates and a range of figures.

Thank you in advance for considering a response to the above questions. We would also appreciate the opportunity to meet with you in person at a time of your convenience.

Best wishes,

Wendy

Wendy McGuinness
Chief Executive

Relevant excerpts from the *Climate Change Commission's Draft Advice*:

Question 23: Do you support our recommendations on reporting on and meeting the NDC? Is there anything we should change, and why? – p. 166

Table 8.4 – p. 158

Table 8.4: Possible economic costs of offshore mitigation used to meet an enhanced NDC

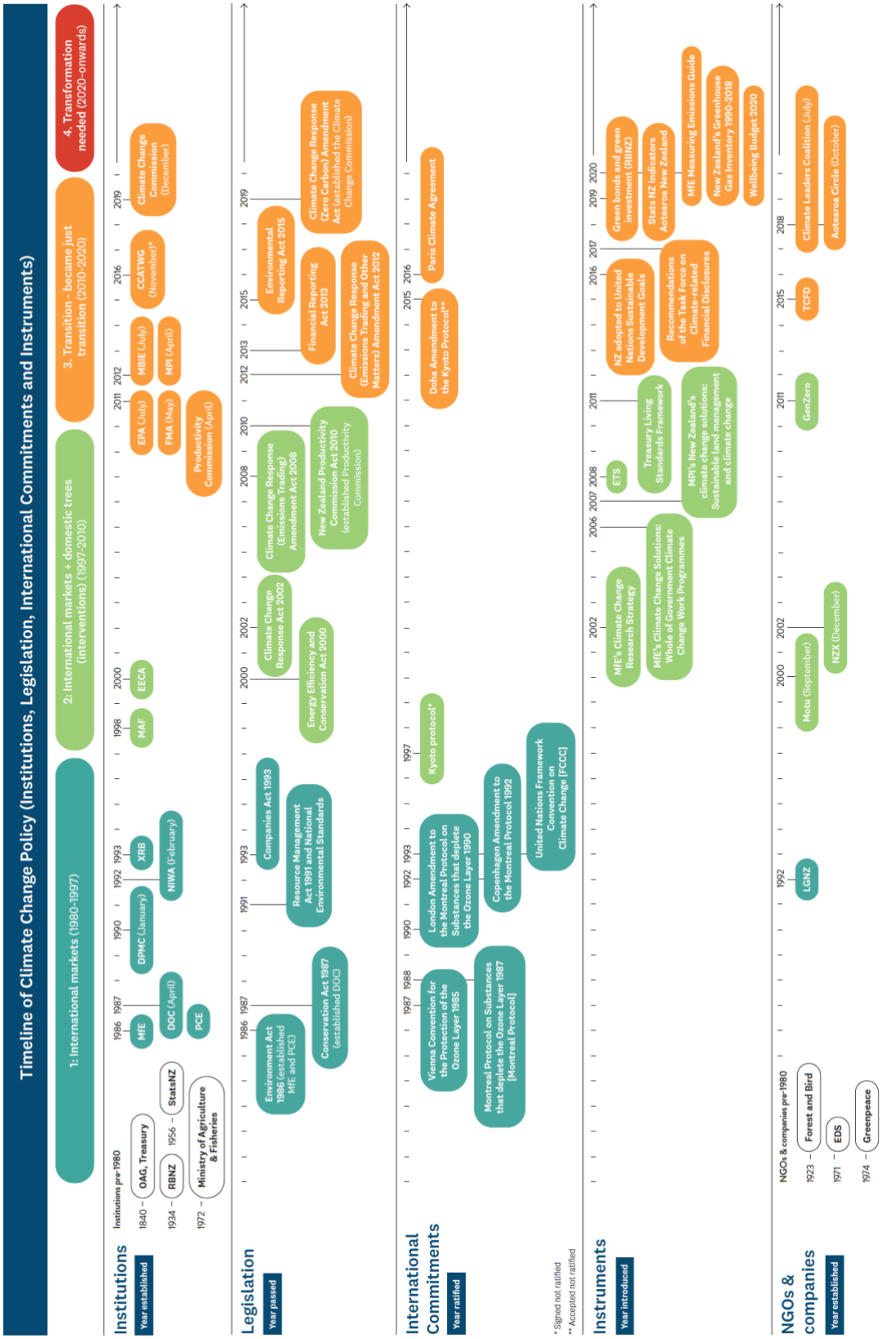
	Price ($/tonne)		
Multiplier for terms of trade	*$30*	*$50*	*$100*
No multiplier	$1.9b	$3.2b	$6.4b
1.8 multiplier	$3.5b	$5.8b	$11.5b

Note: Estimates of the possible multiplier to account for terms of trade effects vary. Here we have used 1.8 based on work done by Infometrics to assess the impact of possible NDCs in 2015 – *A general equilibrium analysis of options for New Zealand's post-2020 climate change contribution.*

This raises concerns that the Government may fail to adequately plan for obtaining offshore mitigation, adding to regulatory uncertainty and increasing the risk that a potentially large amount of offshore mitigation will need to be purchased towards the end rather than spread across the entire target period. This in turn increases the chance that the NDC may not be achieved. – p. 165

There appears to be a domestic reporting gap. Given that the Government intends to require a range of businesses to disclose climate change risks in their financial reports, it is not unreasonable to expect the Government to do the same. We therefore consider that the Government should hold itself accountable for meeting the NDC through regular transparent reporting, including the disclosure of any fiscal risks that may arise from the purchasing offshore mitigation and its strategy for managing those risks. – p. 165

Attachment 2: Timeline of Climate Change Institutions and Instruments since 1980 (Draft)



Attachment 3: TCFD 'Strategy Exercise'

TCFD 'Strategy' Exercise

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Prepared for the TCFD October workshops.

1. **Resources required:**
   1. A brief overview of each of the three climate scenarios that we will be using for this exercise, based on three IPCC representative concentration pathway (RCP) trajectories: RCP 2.6, RCP 6.0 and RCP 8.5.*
   2. Copies of New Zealand business strategies and annual reports from relevant industries published in the public arena.

2. **Method:**

   Task 1: Exploring worlds
   On an A2 sheet, redraw Figure 2 below with a larger centre circle. In each band of the circle, starting with the middle and working your way out, list the opportunities (left) and risks (right) that arise under each of the scenarios. Use the scenario overviews provided as Resource 1 to familiarise yourself with the characteristics of each scenario. [15 minutes]

   Task 2: Disclosures
   Choose an industry from the ones provided in Resource 2. Familiarise yourself with the industry using the examples provided and then prepare a material disclosure that addresses points (a), (b) and (c). [15 minutes]

   Task 3:
   Discuss and share observations with the rest of the group and then report back to the workshop. [30 minutes]

Figure 1: Climate Trajectories in the Cone of Plausibility

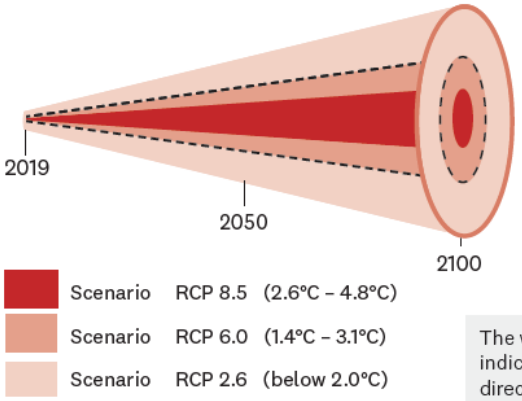
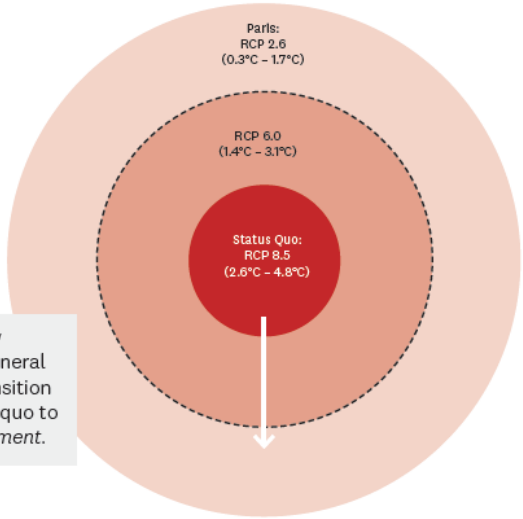
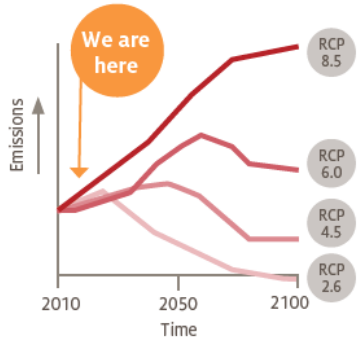


Figure 2: Cone of Plausibility as at 2100



The white arrow indicates the general direction of transition from the status quo to the *Paris Agreement*.

Scientists use the RCPs to model climate change and build scenarios about the impacts. You can use these scenarios to plan for the future.



If we follow the RCP 8.5 pathway, **more adaptation** will be needed.

If we follow the RCP 2.6 pathway, **less adaptation** is needed.

RCP 8.5 leads to much greater temperature increases, and this means greater impacts and greater costs. To adapt to these changes will also cost more. A balance must be struck between the cost of impacts and the cost of adaptation.

(CoastAdapt, n.d.)

* 'The name "representative concentration pathways" was chosen to emphasize the rationale behind their use. RCPs are referred to as pathways in order to emphasize that their primary purpose is to provide time-dependent projections of atmospheric greenhouse gas (GHG) concentrations [not emissions]'. (IPCC, 2007)

'The goal of working with scenarios is not to predict the future but to better understand uncertainties and alternative futures, in order to consider how robust different decisions or options may be under a wide range of possible futures.' (IPCC, 2019)

Task 2: Disclosures

Complete a), b) and c) for your chosen organisation: .....

TCFD Core Element: Strategy	**Disclose the actual and potential impacts of climate-related risks and opportunities on the organisation's businesses, strategy and financial planning, where such information is 'material'.**
a) Describe the climate-related risks and opportunities the organisation has identified over the • short, • medium, and • long term.	
b) Describe the impact of climate-related risks and opportunities on the organisation's • businesses, • strategy, and • financial planning.	
c) Describe the resilience of the organisation's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	

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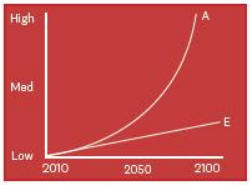
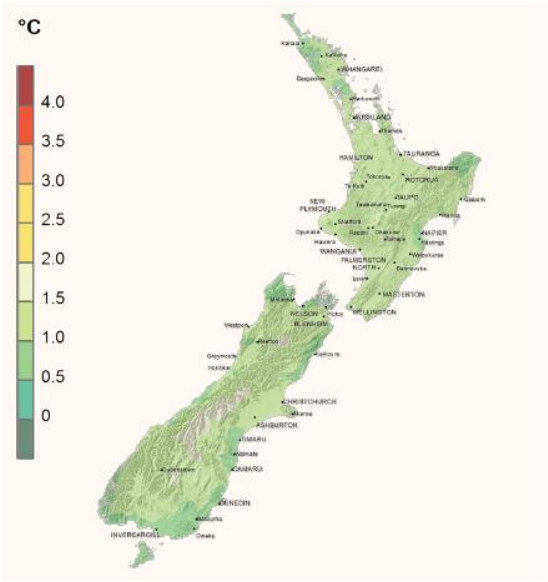
Resource 1: Brief Overview of Scenario RCP 8.5

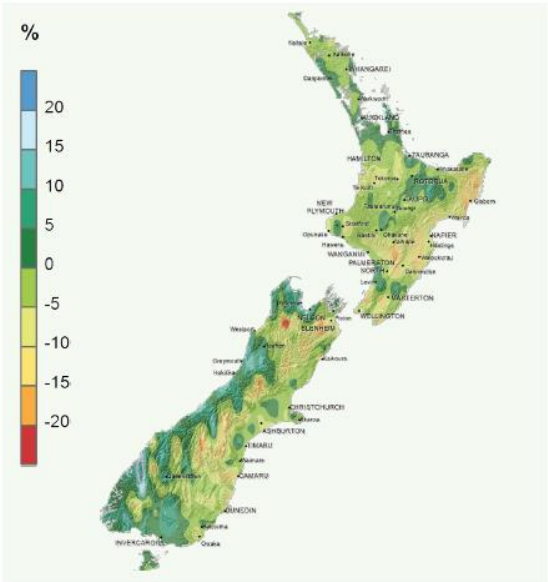
Effort to curb emissions (E)	Effort to adapt (A)	Energy generation	New technology	Transport	Representative Concentration Pathway	Temperature (average increase by the end of the 21st century relative to 1986-2005)	Sea level (average rise by the end of the 21st century relative to 1986-2005)	Extreme weather
		 Coal-fired power	N/A	 Cars, trucks	RCP 8.5	 2.6 °C–4.8 °C	 0.63 m	 Large increase

Temperature Change Between 1995 and 2055

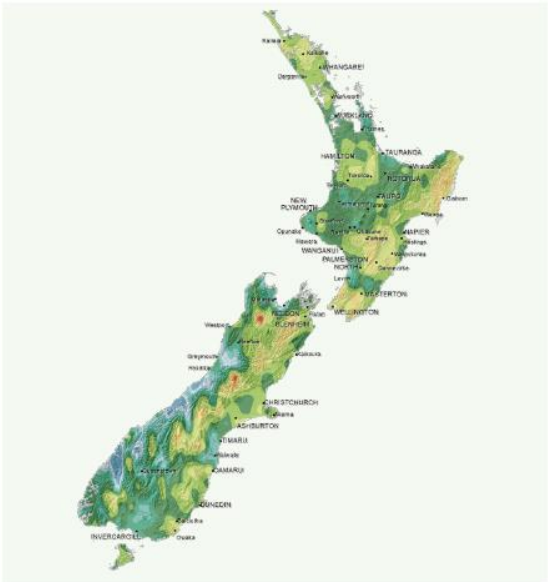


Temperature Change Between 1995 and 2090

Rainfall Change Between 1995 and 2055



Rainfall Change Between 1995 and 2090



Note: The New Zealand maps (above) are from NIWA's *NZ Climate Change Maps* – which use data from the IPCC's *Fifth Assessment Report* (AR5) based on three representative concentration pathways (RCPs): RCP 2.6, RCP 6.0 and RCP 8.5. As explained on the additional information section of NIWA's Our Future Climate New Zealand website, RCPs 'provide an indication of the rate and amount of global greenhouse gas emissions over the coming decades'. These projections use the climate model BCC-CSM1.1 and indicate the potential impacts of climate change in New Zealand. Our infographic has been inspired by CoastAdapt's *Climate Change Infographic*.

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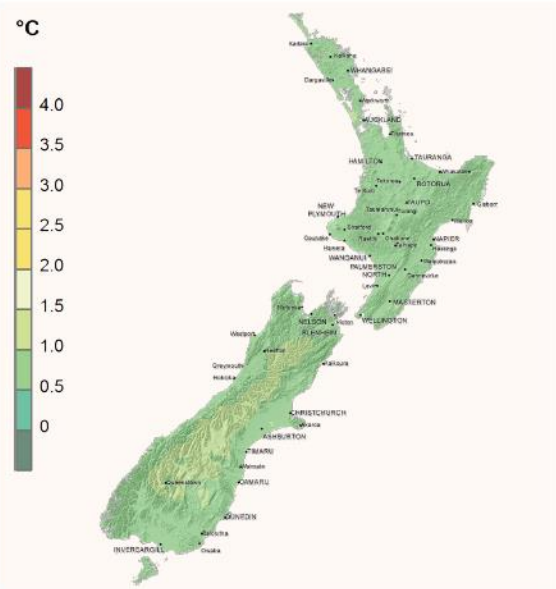
Resource 1: Brief Overview of Scenario RCP 6.0

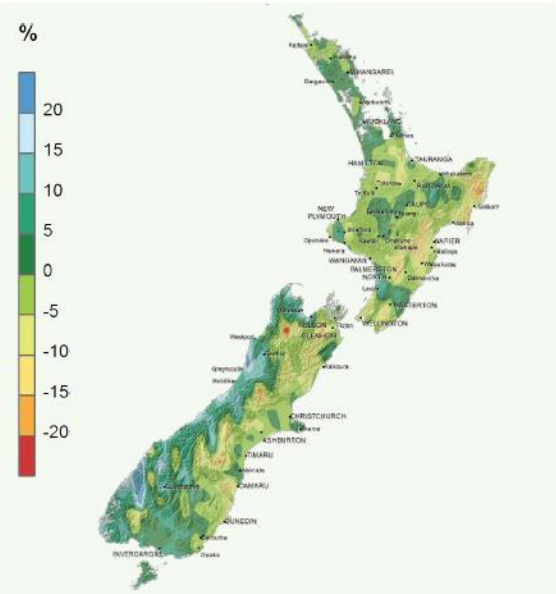
Effort to curb emissions (E)	Effort to adapt (A)	Energy generation	New technology	Transport	Representative Concentration Pathway	Temperature (average increase by the end of the 21st century relative to 1986-2005)	Sea level (average rise by the end of the 21st century relative to 1986-2005)	Extreme weather
High / Med / Low; 2010 / 2050 / 2100; A, E		Mix	N/A	Mix	RCP 6.0	1.4 °C–3.1 °C	0.48 m	Moderate increase

Temperature Change Between 1995 and 2055



Temperature Change Between 1995 and 2090

Rainfall Change Between 1995 and 2055



Rainfall Change Between 1995 and 2090

Note: The New Zealand maps (above) are from NIWA's *NZ Climate Change Maps* – which use data from the IPCC's *Fifth Assessment Report* (AR5) based on three representative concentration pathways (RCPs): RCP 2.6, RCP 6.0 and RCP 8.5. As explained on the additional information section of NIWA's Our Future Climate New Zealand website, RCPs 'provide an indication of the rate and amount of global greenhouse gas emissions over the coming decades'. These projections use the climate model BCC-CSM1.1 and indicate the potential impacts of climate change in New Zealand. Our infographic has been inspired by CoastAdapt's *Climate Change Infographic*.

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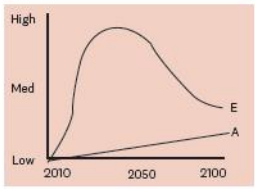
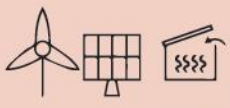
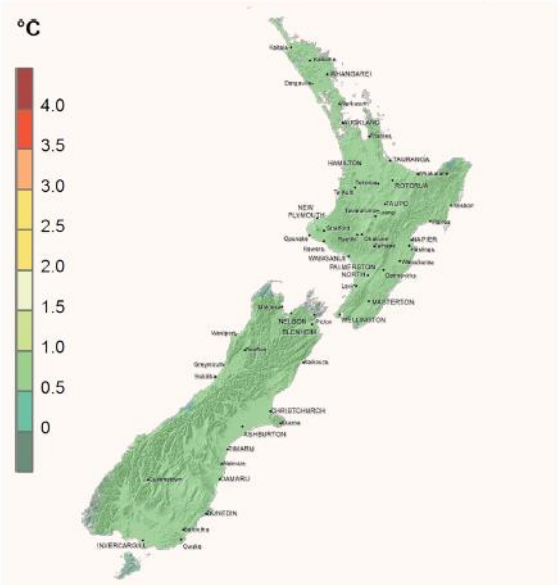
Resource 1: Brief Overview of Scenario RCP 2.6

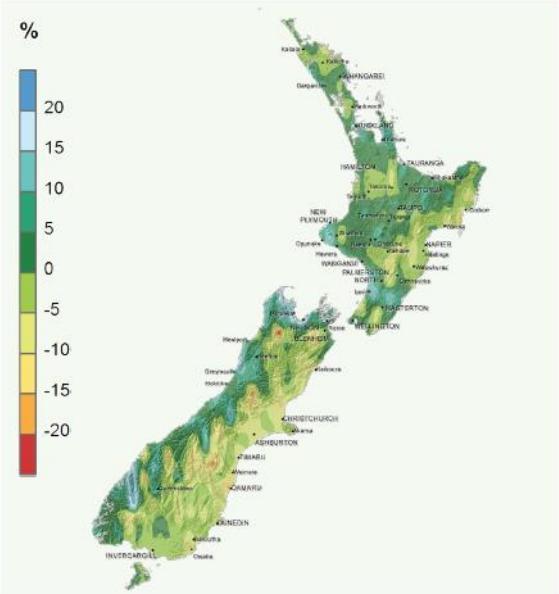
Effort to curb emissions (E)	Effort to adapt (A)	Energy generation	New technology	Transport	Representative Concentration Pathway	Temperature (average increase by the end of the 21st century relative to 1986-2005)	Sea level (average rise by the end of the 21st century relative to 1986-2005)	Extreme weather
		 Renewable	Emissions capture	 Bicycles, public transport, e-cars		 0.3 °C–1.7 °C	 0.4 m	 Small increase

Temperature Change Between 1995 and 2055



Temperature Change Between 1995 and 2090

Rainfall Change Between 1995 and 2055



Rainfall Change Between 1995 and 2090

Note: The New Zealand maps (above) are from NIWA's *NZ Climate Change Maps* – which use data from the IPCC's *Fifth Assessment Report* (AR5) based on three representative concentration pathways (RCPs): RCP 2.6, RCP 6.0 and RCP 8.5. As explained on the additional information section of NIWA's Our Future Climate New Zealand website, RCPs 'provide an indication of the rate and amount of global greenhouse gas emissions over the coming decades'. These projections use the climate model BCC-CSM1.1 and indicate the potential impacts of climate change in New Zealand. Our infographic has been inspired by CoastAdapt's *Climate Change Infographic*.

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Resource 2: Examples of Business Strategies and Annual Reports from Relevant Industries

Agriculture, Forestry and Fishing

- Beef + Lamb New Zealand. (May 2018). *Environment Strategy and Implementation Plan 2018-22*. https://beeflambnz.com/sites/default/files/levies/files/Env-strategy-Imp-plan.pdf.

Construction

- Fletcher Building. (2019). *Annual Report 2019*. https://fletcherbuilding.com/assets/4-investor-centre/annual-reports/2019-annual-report.pdf.

Electricity, Gas, Water and Waste Services

- Watercare. (January 2019). *Watercare's Climate Change Strategy: Mitigation and adaptation*. https://wslpwstoreprd.blob.core.windows.net/kentico-media-libraries-prod/watercarepublicweb/media/watercare-media-library/sustainability/climate_change_strategy.pdf.

Financial and Insurance Services

- NZ Super Fund. (March 2019). *"How We Invest" White Paper: Climate Change Investment Strategy*. https://nzsuperfund.nz/sites/default/files/documents-sys/Guardians of NZ Super - Climate Change White Paper March 2019.pdf.
- Reserve Bank of New Zealand. (December 2018). Reserve Bank Climate Change Strategy. https://www.rbnz.govt.nz/financial-stability/climate-change/strategy.
- Wesptac NZ (prepared by EY). (April 2018). *Climate Change Impact Report*. https://www.westpac.co.nz/assets/Sustainability/Westpac-NZ-Climate-Change-Impact-Report.pdf.

Mining

- New Zealand Oil & Gas. (2019). *Annual Report 2019*. https://www.nzog.com/dmsdocument/430-nzog-2019-annual-report.

Public Administration and Safety

- Ministry of Defence and NZDF. (November 2018). *The Climate Crisis: Defence readiness and responsibilities*. https://www.defence.govt.nz/assets/Uploads/66cfc96a20/Climate-Change-and-Security-2018.pdf.
- Committee on Climate Change (UK). (May 2019). *Net zero domestic emissions infographic*. https://www.theccc.org.uk/wp-content/uploads/2019/05/CCC-Net-Zero-Infographic.pdf.
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- Auckland Council. (July 2014). *Low Carbon Strategic Action Plan: The aim of the plan* [download all]. https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/topic-based-plans-strategies/environmental-plans-strategies/docslowcarboncopy/low-carbon-strategic-action-plan-full.pdf.

Transport, Postal and Warehousing

- Air New Zealand. (2019). *Annual Shareholder Review 2019*. https://indd.adobe.com/view/fa56c6c2-d4cd-4101-b2e8-600cdd75535d.

Attachment 4: Government Department Strategies Index 2020 Preliminary Analysis

A: Introduction

This work is a repeat of research the Institute undertook in 2019. The results below are preliminary and should be treated as work in progress. Learn more about the Government Department Strategies (GDS) by visiting the *GDSIndex* pages[23] on our website and the research reports here.[24] This includes the Institutes definition of a GDS, the methodology and a table of each GDS in operation with a pdf.

The work fits under both our *StrategyNZ* project and our *ClimateChangeNZ* project.

Note: This research is still work in progress. The final results will be published in a Working Paper in late April or early May 2021.

B: Key Observations to Date

We note there has been an increase in the mentions of climate change.

Government Department Strategies (in total)

- The number of GDSs in operation as at 1 January 2018 and as at 31 December 2020 has increased significantly – an increase of 54 GDSs, meaning the tool of a GDS is increasingly been used to bring about change (54/202 [37%], 2020 202, 2018 148).
- The number of explicit mentions of climate change is still very low (2020 37/202 [18%], 2018 21/148 [14%].
- The number of mentions (explicit and implicit) of climate change in GDSs has increased (2020 62/202 [31%], 2018 36/148 [24%]), but still very low considering even a light mention has been interpreted as implicit.
- The difference of 26 (62-36) is largely due to the Economic Development and Infrastructure Sector (2020 15, 2018 7), who published 8 new GDSs that mention climate change. See Figures 5 and 6.
- The split between explicit and implicit mentions remains about the same (2020 60/40 and 2018 58/42).
- Of the 80 new GDSs published between 1 January 2019 and 31 December 2020, only 31 of the 80 (39%) mention climate change.

Departments

- Climate change has been mentioned in one additional department: Ministry of Social Development (2020 14, 2018 13).

Sectors

- Climate change has been mentioned in one additional sector: Social Services and Communities Sector (2020 8, 2018 7).

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23 See https://www.mcguinnessinstitute.org/policy-projects/strategynz/gdsindex/

24 See https://www.mcguinnessinstitute.org/publications/working-papers/

Although the number of mentions of climate change has improved, it is important to note that our interpretation of explicit mentions and implicit mentions have been interpreted very generously.

Given the extensive and pervasive impact climate change is likely to have on strategy over the next 5 to ten years, the level of uptake is disappointing.

Arguably the goal would be for all, or at least most GDSs published in the next two years to be 100% explicit in mentioning climate change (notably in the last two years only 39% of new GDSs mentioned climate change).

This seems low given the current narrative being advocated by government. For example, the zero target in the Climate Change Response Act 2002, the announcement of a climate emergency and the December 2020 pledge by New Zealand government to be carbon-neutral by 2025. There seems a time lag between what Ministers want and government departments are delivering. See discussion in PART 3: SPECIAL TOPICS.

C: Research Findings to Date

1. Analysis of Government Department Strategies

a) There was an increase in the uptake by government departments in terms of taking on board climate change challenges and action when implementing government department strategies (31% in 2020 [62 of 202] GDSs discuss climate change; in 2018 it was only 24% [32 out of 148]).

b) Even those GDSs that do discuss climate change in their strategies, the quality of discussion has not significantly changed between 2018 and 2020. See Figures 1 and 2 below.

- 69% in 2020 did not mention climate change (76% in 2018).
- 18% in 2020 explicitly mentioned climate change (14% in 2018).
- 13% in 2020 implicitly mentioned climate change (10% in 2018**).**

Figure 1: 2020 GDSs [out of 202]
Quality of Discussion on climate change

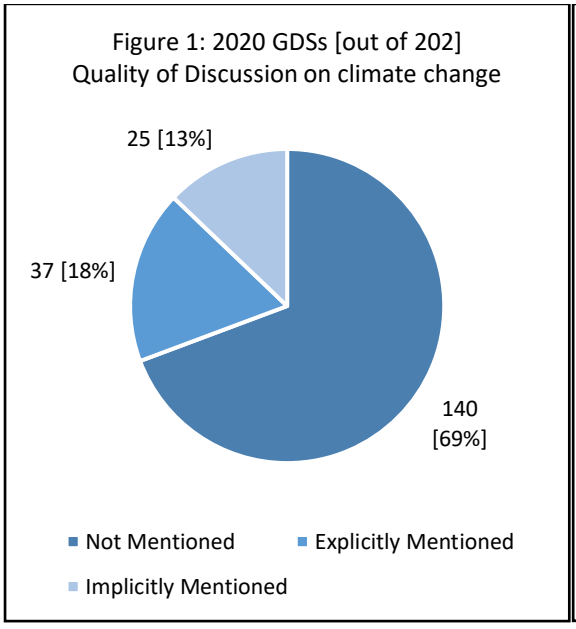
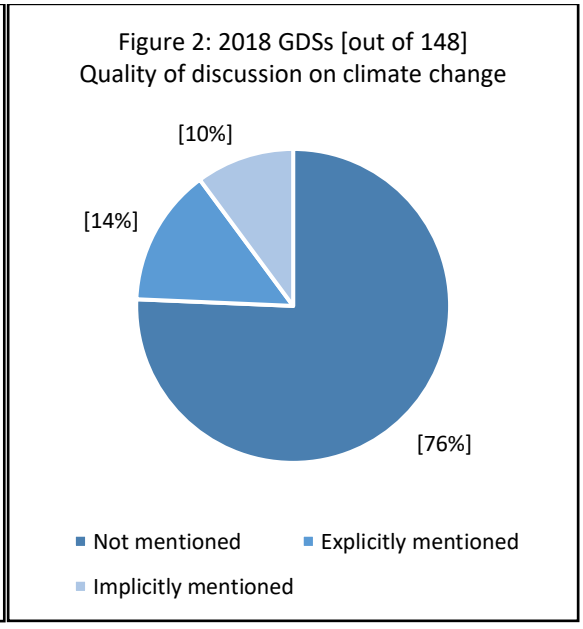


Figure 2: 2018 GDSs [out of 148]
Quality of discussion on climate change



2. Analysis of Government Departments

An analysis of the 32 government departments was undertaken at the middle tier, with a focus on the number of departments that mention climate change in their GDSs. See Figures 3 and 4 below. Note: A small number of departments do not currently have a GDSs in operation as at 31 December (2020 5, 2018 4).

a) 14 departments in 2020 mention climate change in their GDSs, an increase of 1 (13 in 2018).
b) As 5 departments do not publish any GDSs, this means the remaining 13 departments (who publish GDSs), never mention climate change.
c) This means, as at 31 December 2020, over half of New Zealand's government departments do not mention climate change in publicly accessible GDSs [13] or do not publish GDSs at all [5].

Figure 3: Government Departments that mention Climate Change 2020 [out of 32]

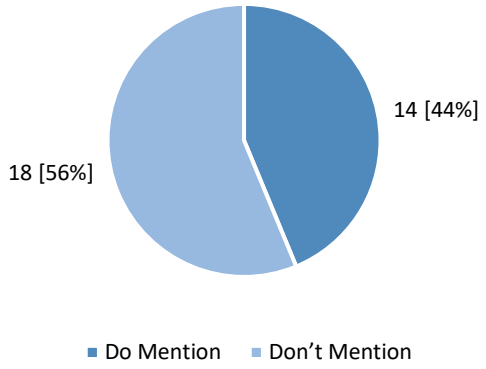
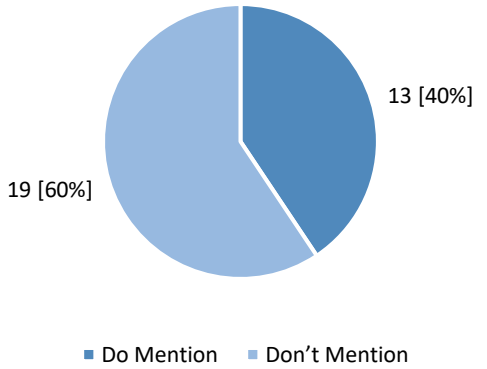


Figure 4: Government Departments that mention Climate Change 2018 [out of 32]



3. Analysis of Sectors

Government sectors tie together the departments and their respective strategies. Looking at strategy documents and departments as derivatives of government sectors illustrates which sectors are working hard to address climate change within their public available strategic documents.

Figure 5: 'Number of GDS' that mention climate change by sector in 2020 [62]

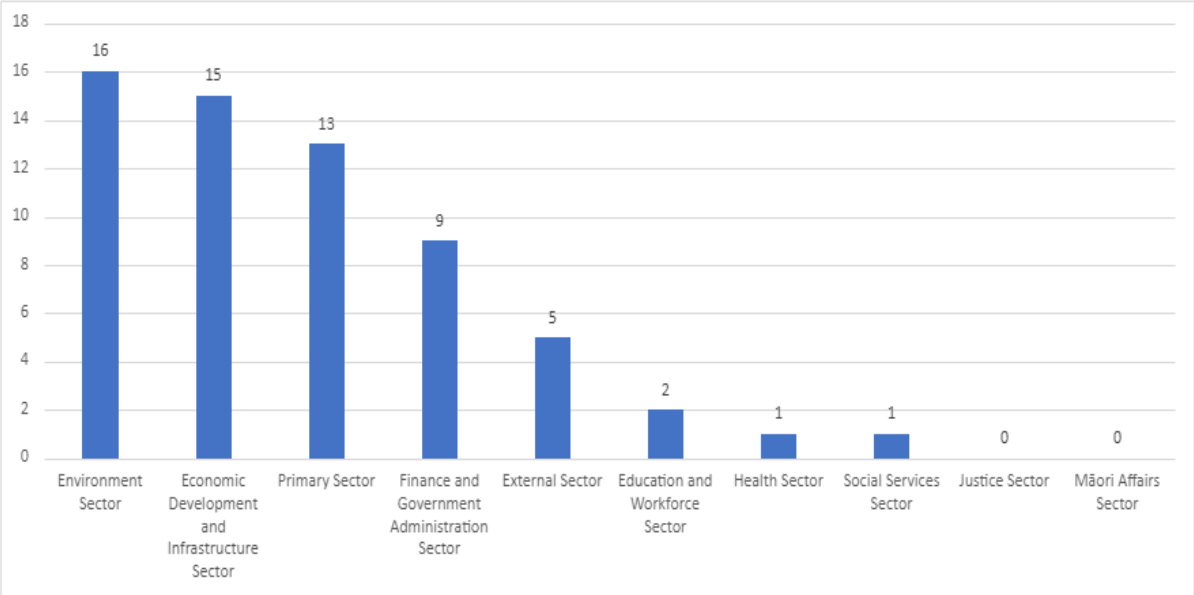
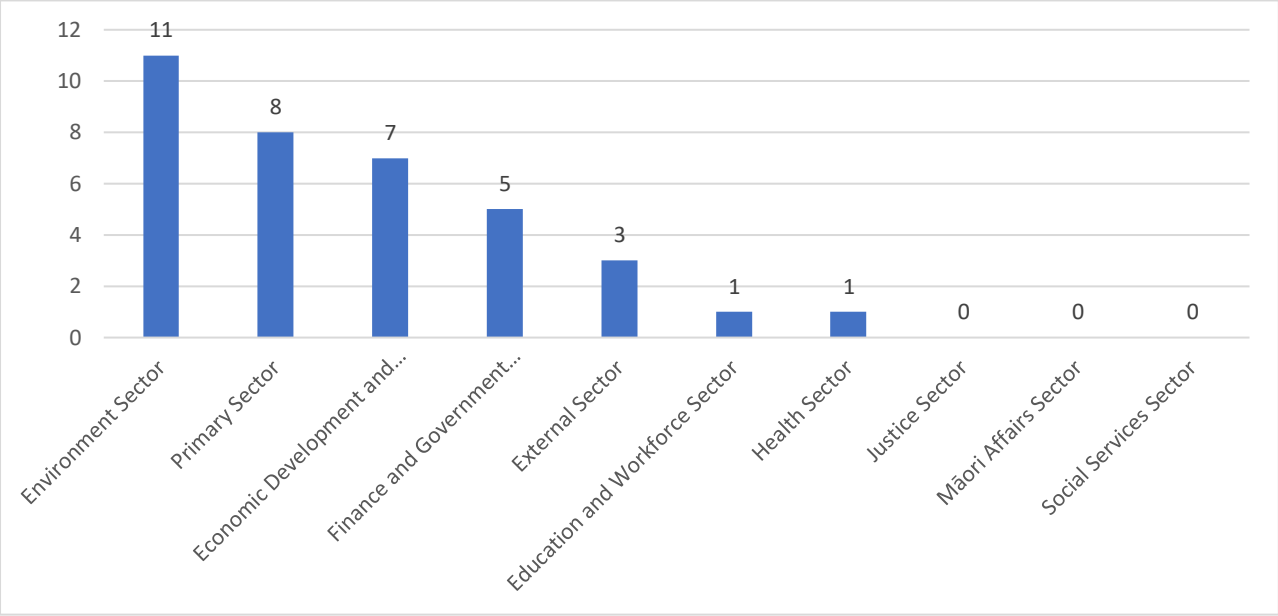


Figure 6: 'Number of GDS' that mention climate change by sector in 2018 [36]



An analysis of the ten government sectors was undertaken at the inside tier, with a focus on the number of departments within each sector and how many of these GDS documents refer to climate change.

a) Figures 5 and 6 show that the major improvement in sector reporting on climate change is being led by the Economic Development and Infrastructure Sector (2020 15, 2018 7), with 8 new GDSs mentioning climate change. Next is the Environment Sector (2020 16, 2018 11), with 5 new GDSs mentioning climate change.

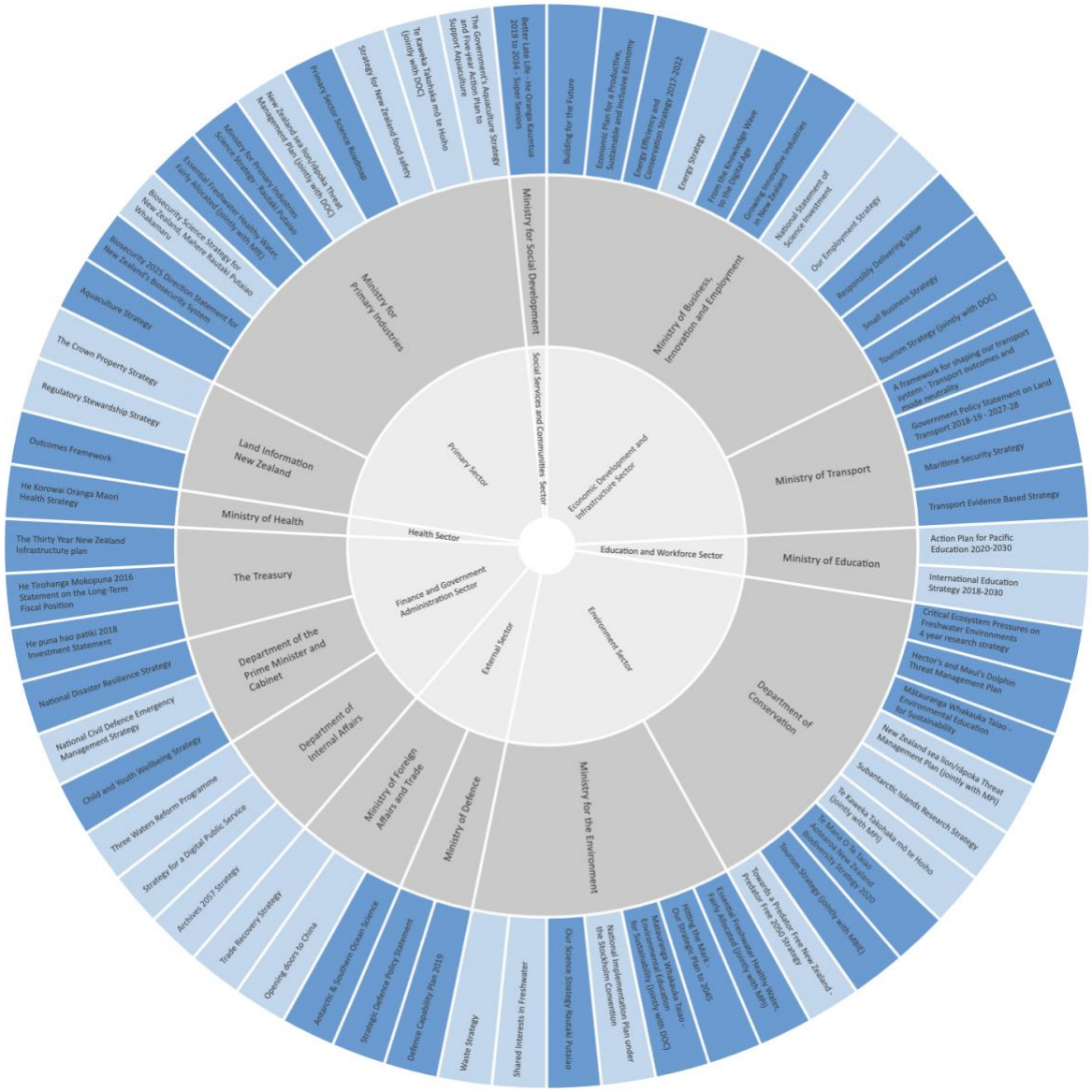
b) Eight out of ten sectors in 2020 included some level of climate change discussion in their respective department's GDSs. In 2018, it was seven out of the ten sectors.
c) In 2020, the sectors with the smallest mentions of strategy surrounding climate change were the Health Sector and the Social Services Sector (1 each).
d) In 2020, neither the Justice Sector or Māori Affairs Sector have GDSs that mentioned climate change.

4. Analysis of the climate change strategy wheels (comparing 2020 with 2018)

When looked in totality, using our strategy wheels in Figure 7 and 8, the research results are easier to assess and understand. Put bluntly, although the number of strategies have increased significantly, the number of mentions do not indicate the level of increase one would expect.

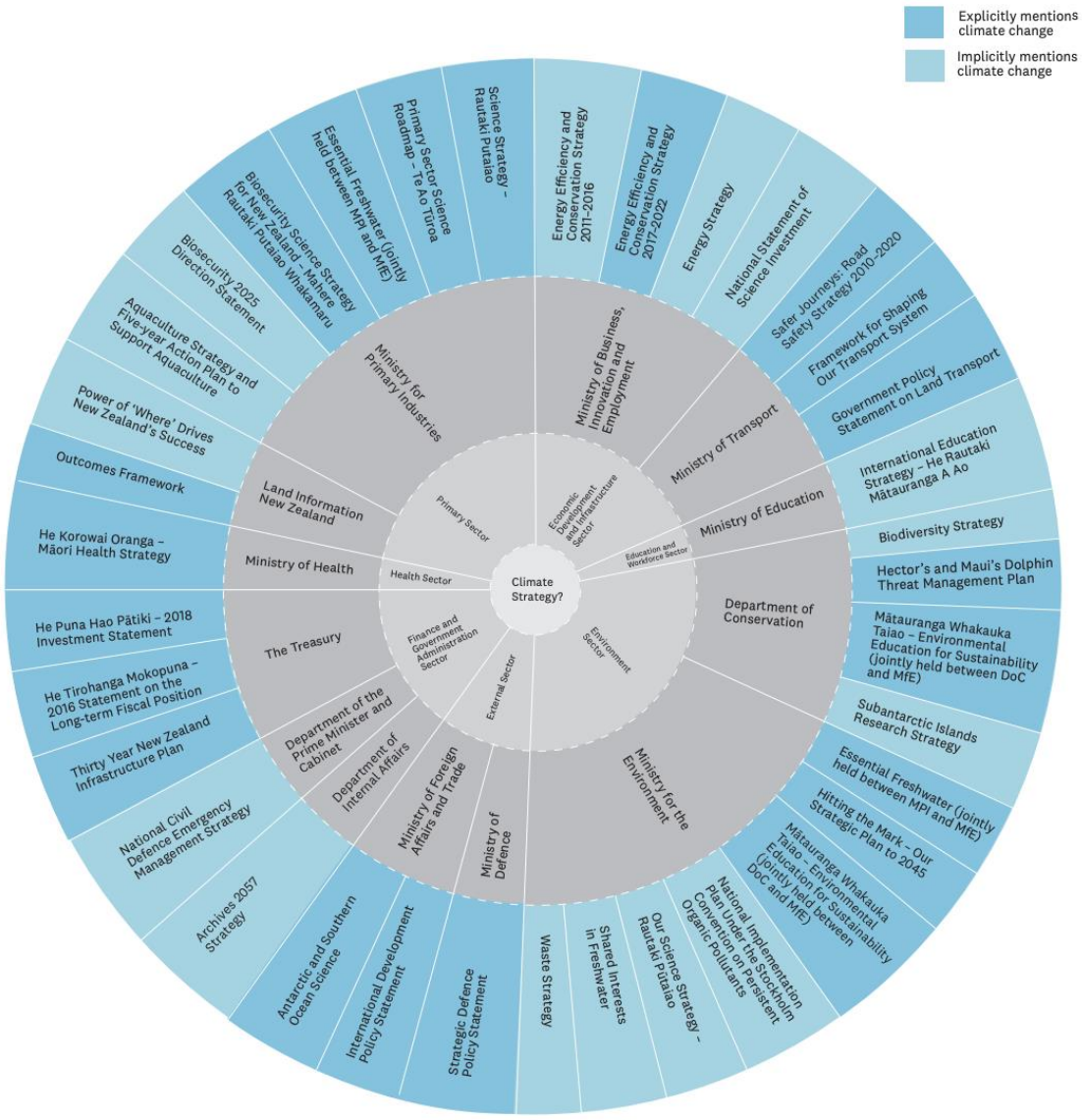
a) In 2020, 58 GDSs mention climate change (either implicitly or explicitly). Of the 58, 52 (89%) were published after 2010.
b) In 2018, 36 GDSs mention climate change (either implicitly or explicitly). Of the 36, 30 (83%) were published after 2010.

Figure 7: Climate Change Strategy Wheel 2020 [62]



	Explicitly Mentions Climate Change	Implicitly Mentions Climate Change
	37/62 [60%]	25/62 [40%]
Key	37/202 [18%]	25/202 [12%]

Figure 8: Climate Change Strategy Wheel 2018 [36]



	Explicitly Mentions Climate Change	Implicitly Mentions Climate Change
	21/36 [58%]	15/36 [42%]
Key	21/148 [14%]	15/148 [10%]

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