A Zero Carbon Act for New Zealand:

Revisiting *Stepping stones to Paris and beyond*

March 2018

Parliamentary Commissioner for the Environment
Te Kaitiaki Taiao a Te Whare Pāremata

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Foreword

In July last year, my predecessor, Dr Jan Wright, delivered her final report as Parliamentary Commissioner for the Environment. In that report she recommended that New Zealand should follow in the footsteps of the United Kingdom (UK) and legislate for a process whereby progressive and permanent reductions in greenhouse gas emissions could be achieved over time.

The UK Climate Change Act 2008 enacted a long-term emissions reduction target and then elaborated a process whereby a succession of progressively lower carbon budgets are set to put the economy on a trajectory to meet that long-term target. Dr Wright described these carbon budgets as 'stepping stones' and picked up the idea in the title of her report: *Stepping stones to Paris and beyond: Climate change, progress, and predictability*.

Her report came 18 months after the Paris climate summit. In the intervening period there had been a great deal of international activity as governments set about implementing policy initiatives to deliver on the Nationally Determined Contributions (NDCs) they had offered in the course of the summit negotiations. New Zealand was no exception. Dr Wright noted that:

> *"Many have criticised our 2030 target as being not ambitious enough. For me, the bigger issue is how we chart a pathway to that target and beyond. How do we change the direction in which we are travelling and make large and lasting reductions in our greenhouse gas emissions?"*[1]

In proposing the UK formula of a legislated target and carbon budgets, Dr Wright was promoting a statutory process that would maintain pressure on policy makers to keep the long-term goal of emissions reductions at the centre of their attention. Her enthusiasm for the UK approach did not surprise me. Over the seven years that I led the environment programme at the OECD, one of the questions most frequently asked by countries wrestling with climate policy was: What is best practice? What national policy setting would you recommend that we study?

We were able to point to many interesting policy innovations at the micro level in many economies. But for an approach that tried to chart a long-term emissions trajectory and provide the policy stability needed to encourage investment in a low carbon economy, the UK's approach stood out as being exceptional.

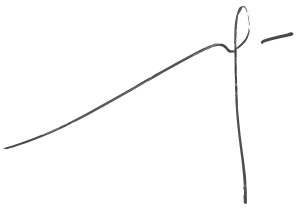
However, Dr Wright was acutely aware that implementing such machinery in the first place required a level of political commitment that was out of the ordinary. That had occurred in the 2005–2008 period in the UK when a conservative opposition party decided to take the lead in calling for a new approach. In the end, the UK Climate Change Act was adopted by the House of Commons 463 votes in favour, three against.[2] Reflecting on the New Zealand context, she expressed this reservation:

> *"I would not want such a law to scrape through in Parliament. Support across political parties is vital. Climate change is the ultimate intergenerational issue, and governments change."*[3]

Barely three months after issuing her report, Dr Wright retired and a new Government committed to implementing the broad thrust of her recommendations took office. In succeeding Dr Wright, I have had to consider whether I can usefully contribute to the building of that cross-party support which she called for. I have concluded that I can in two ways. In the first place, a large amount of material was gathered to inform the *Stepping Stones* report, not all of which was included in the report. Some of this additional material may provide useful context as policies are developed.

Secondly, now that her proposal for a Climate Commission is to be put to the test of parliamentary acceptance, it may be useful to say more about the key design features that will have to be addressed. Since the whole purpose of a UK-style legislative mechanism is to underwrite policy consistency and predictability over lengthy time periods, its consequences needed to be thoroughly debated and understood in advance. While there are many similarities between the constitutional arrangements of both countries, our emissions challenges are very different. So are the political circumstances in which reform is being attempted. In short, legislating for a Climate Commission in New Zealand will not be a simple carbon copy of the UK model.

My comments in this report build on Dr Wright's recommendations and try to highlight some of the challenges and trade-offs that will need to be considered in developing a system of legislated targets and carbon budgets that makes sense of New Zealand's particular circumstances. Some of these will no doubt be difficult to resolve. But we are better to thoroughly debate them now, and reach a durable accommodation, than legislate for a procedure that does not stand the test of time.



Simon Upton

Parliamentary Commissioner for the Environment

Wāhinga kōrero

I te Hōngongoi o tērā tau, i tukuna e te Kaikōmihana tōmua, a Dr Jan Wright, i tana pūrongo whakamutunga hei Kaitiaki Taiao a Te Whare Pāremata. I roto i taua pūrongo i tūtohu ia me whai a Aotearoa i ngā tapuwae o Peretānia. Arā, me whakature i te tukanga kia tutuki ai ngā whakahekenga kaneke, pūmau hok o ngā putanga haurehu kati mahana.

I whakature te Ture Panoni Āhuarangi o Peretānia 2008 i te whāinga whakaheke putanga haere ake nei. Kātahi, ka whakamārama i te tukanga e whakaritea ai ngā pūtea waro e heke ai te nui o te waro ia pūtea kia tika te rerenga o te ōhanga kia tutuki taua whāinga pae tawhiti. I kīia ēnei pūtea waro he 'tapuwae kōhatu' e Dr Wright, ā, i whakaurua taua whakaaro ki te ingoa o tana pūrongo, arā: Ngā tapuwae kōhatu ki Pārihi, ki tua atu hoki: panoni āhuarangi, te kaneke, me te āhei ki te matapae.

I puta tana pūrongo i ngā marama tekau mā waru i muri iho i te hui taumata āhuarangi o Pārihi. I waenganui i aua mea e rua, he maha ngā mahi huri noa te ao i te wā i tīmata ngā kāwanatanga ki te whakarite i ngā take kaupapa here kia ea ai ngā 'utanga ā-motu' i tukuna e rātou i te wā o ngā whakawhitiwhiti kōrero mō te hui taumata. Ko Aotearoa tētahi o aua motu. E ai ki a Dr Wright:

> *"He tokomaha ngā tāngata kua kī he ngoikore tō tātou whāinga mō 2030. Ki a au nei, ko te tino take, me pēhea tātou e whakamahere ai i te huarahi ki taua whāinga, ki tua atu hoki. Me pēhea e kōrure tā tātou haere, ā, e whakapūmau ai i te whakaheke nui o ō tātou putanga haurehu kati mahana?"*[1]

I tana marohi i te tātai o Peretānia, arā te whāinga i whakaturehia me ngā pūtea waro, i whakatairangahia e Dr Wright he tukanga ā-ture e herea ai ngā kaihanga kaupapa here kia noho pū te whāinga whakaheke putanga hei kaupapa haere ake nei. Kāore taku ohorere i tana kipakipa mō tā Peretānia tirohanga. I ngā tau e whitu i ārahi au i te hōtaka tāiao ki te OECD, ko tētahi o ngā tino pātai i pātaihia e ngā motu e āta whakaaro ana mō te kaupapa here āhuarangi ko tēnei: he aha te tikanga pai rawa? He aha te kaupapa here ā-motu e tūtohu ai koe mā mātou e tirotiro?

Ka āhei mātou ki te tohu ki te maha o ngā auaha kaupapa here moroiti whakaihiihi ki ngā ōhanga maha. Engari, mō tētahi tirohanga i whakamātau ki te whakamahere i te rerenga putanga haere ake nei, ki te hoatu hoki i te kaupapa here pūmau e akiaki ai i te haumi moni ki te ōhanga waro iti, kāore he mea pai ake i tā Peretānia tirohanga.

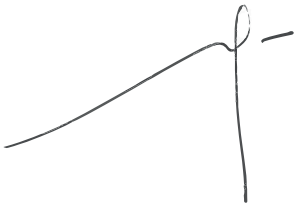
Heoi anō, i mōhio pū a Dr Wright ki te whakarite i te anga pēnei me tautoko te tino nuinga o ngā kaitōrangapū. Ehara i te mea hanga noa. I puta tēnei āhuatanga i 2005-2008 i Peretānia. I whakaaro tētahi rōpū tōrangapū āpitihana nō te taha matau kia arataki i te marohi mō te tirohanga hou. Te mutunga iho, ka whakaturehia te Ture Āhuarangi o Peretānia e te Whare o Raro e 463 ngā pōti whakaae, e toru ngā pōti whakahē.[2] E pā ana ki Aotearoa, e pēnei ana tana potau:

> *"Kāore au e pīrangi kia tata te pāhitanga o tētahi ture pēnā i te Pāremata. He mea nui te tautoko whānui a tēnā pāti, ā tēnā pāti. Ko te panoni āhuarangi te tino take tuku iho a tētahi whakatipuranga ki tētahi whakatipuranga."*[3]

Kāore i hipa te toru marama i muri i te tukunga o tana pūrongo, i rītaia a Dr Jan Wright, ā, i noho haepapa tētahi Kāwanatanga hou ki te whakarite i te tino kaupapa o ana tūtohu. Kua āta whakaaro au mēnā e āhei au ki te whakarewa i te tautoko whānui a tēnā rōpū tōrangapū, a tēnā rōpū tōrangapū i karanga ai ia. Kua whakatau au e rua ngā kaupapa e taea ai e au. I te tuatahi, he maha ngā rauemi i kohikohia hei whakamārama i te pūrongo Ngā Tapuwae Kōhatu kāore i uru ki taua pūrongo. Mā ētahi o aua rauemi pea e āwhina i te wā e whakaritea ana ngā kaupapa here.

Tuarua, i te mea ka whakamātauria tana tūtohu mō te Kōmihana Āhuarangi e te Pāremata, he pai pea ki te kōrero mō ētahi o ngā āhuatanga hoahoa kia whakaarohia. Nā te mea ko te tino take o te tukanga ture pērā i tā Peretānia hei tūāpapa kia ōrite ngā kaupapa here, kia āhei hoki te matapae haere ake nei. Me mārama rāwa, me taupatupatu rawa ngā tukunga iho. Ahakoa he tini ngā ōritetanga o ngā whakahaerenga ture kāwanatanga o ngā motu e rua, he tino rerekē ā tātou wero mō ngā putanga. He tino rerekē hoki ngā āhuatanga tōrangapū i te wā e whakamahia ana te whakahoutanga. Nā, ehara te whakature i te Kōmihana Āhuarangi i Aotearoa i te tārua noa iho o te tauira o Peretānia.

Kua noho aku kōrero i roto i tēnei pūrongo i runga i ngā tūtohu a Dr Wright, ā, e whakamātau ana ki te miramira i ētahi o ngā wero me ngā whāritetanga hei whakaarotanga mō te whakarite i te pūnaha whakature i ngā whāinga me ngā pūtea waro e tika ana mō Aotearoa. Kāore e kore he uaua te whakaea i ētahi o ērā. Heoi anō, he pai ake te āta wānanga ināianei, kia pūmau ai te whakaaetanga i te whakature, i te tukanga e pāhekeheke ai.



Simon Upton

Te Kaitiaki Taiao a Te Whare Pāremata

Part 1

What's different about New Zealand?

Inevitably, the context in which New Zealand seeks to establish a Climate Commission is different from that which prevailed a decade ago in the United Kingdom (UK). In one important respect – the negotiation of the Paris Agreement in late 2015 – the case for serious long-term action has only strengthened. But beyond that we need to be aware of the differences that exist between two very different-sized economies with very different emissions profiles and different political dynamics. We also need to be able to take stock of some of the lessons that can be learnt from the UK's experience. In this section, I have sought to tease out some of these differences, as well as reflect on the experience of the UK over the first decade of the Climate Change Act's implementation.

1.1 The policy-making context

New Zealand's approach to climate change policy since the mid-1990s has not lacked for sophistication. Over the course of nearly a quarter of a century New Zealand has explored both carbon taxes and emissions trading schemes (finally adopting the latter in 2008). It has played a major role both domestically and internationally in developing the means to account for forest sinks, and it has been keenly engaged in international conversations on emissions trading.

A common theme throughout – from both governments and businesses – has been the need to achieve emissions reductions at the least cost. New Zealand has seen itself as a very small, exposed trading nation whose competitiveness should not be put at risk. To this should be added a preference for market-based instruments that stems back to the economic reforms of the 1980s. This context explains, at least in part, some or all of the following features of New Zealand's approach to climate policy:

- There has been a dominant view that price-based mechanisms will incentivise changes more efficiently than politicians developing sectorally specific policies.
- There has been a clear view that all sectors and all gases should be priced equally, that all reductions and removals are of equal worth, and for that reason it doesn't matter where or in what sequence emissions occur. In other words, our policy has been built on an assumption that all gases are fungible. Notwithstanding this, agricultural emissions have been consistently left out of any attempts to price emissions because they are viewed as particularly difficult to deal with.

- It has been accepted from the outset that sequestration of carbon in trees is a valid offset for emissions. The rationale for relying on forest sinks in the short to medium term has been justified on the basis that it would provide a bridge to the emergence of emissions reduction technologies that in the short term are not cost effective. There has been less acknowledgement that forest sinks are limited and cannot provide a truly permanent solution.
- The estimated economic cost of emissions reductions at home has justified extensive reliance on offshore credits to meet international commitments – more so than most other countries.

From the outside, New Zealand's policy record on climate change reads very much as one of developing sophisticated policy tools but not being prepared to deploy them in a way that will 'bite'. While the policy efforts of successive governments over a 20-year period finally settled on the centrality of an emissions trading scheme (ETS) as a core policy tool, there was no agreement on a long-term national goal or a process for progressively moving towards it.

The ETS has been operated with muted price signals and consequently had little effect. Measures taken in 2009 eliminated any meaningful cap and diluted by half the requirement to surrender emission permits. This removed the signal to investors and businesses that they needed to plan for future carbon price increases, and instead created uncertainty. Instead of an expected growth in afforestation, there was deforestation over the period.

In other words, policy has been 'dialled back' waiting for the rest of the world to move. Strong economic and population growth saw emissions rise almost continuously over the period. As a result, the path dependency of existing emissions-intensive technologies has not been significantly deflected.

As my predecessor noted, the UK's legislated solution of a long-term target with a process for agreeing diminishing carbon budgets to achieve it was passed with widespread cross-party support. There is no denying the very specific political dynamic that took hold in the 2005–2008 period. A conservative opposition leader, David Cameron, took the lead in calling for a more concerted and aggressive policy response providing the cover that a willing government needed.

It would be tempting to conclude that the only thing standing between New Zealand and the sort of approach taken by the UK is a deficit of political will and consensus. While the importance of cross-party agreement should not be underestimated, neither can the wider policy context be ignored.

The UK developed its Climate Change Act as a Member of the European Union (EU), a large group of countries with a strong tradition of pursuing environmental policies in a consistent and coordinated way. While the UK's initiative in setting up the Climate Change Act was inspired in part by a desire to take a leadership position (both within Europe and globally), it did so within the context of an extensive climate policy framework that had been developed at the European level.

In advising on the level at which the initial carbon budgets should be set, the UK Committee on Climate Change used as its baseline the 2020 target required under the EU framework (20% reduction by 2020). The Committee considered that it was best not to depart from the EU framework for the first three budgets *"given inertia and lead times for policy development and innovation."*[4] Therefore, it was the EU framework that was already in place that defined the level at which these budgets were set, not the 2050 target in the UK Climate Change Act.

Beyond the existence of a short- to medium-term European target, the UK was also part of the European ETS and subject to a variety of European Directives, most notably the Renewables Directive but others as well, including those dealing with landfills and industrial emissions. The varying contributions these policy instruments made to the UK's emissions trajectory will be debateable. The important point to make, in the light of New Zealand's plans, is that EU policy processes have always been constructed sectorally.

While much effort was expended on developing an ETS (as New Zealand too has done), there was never an expectation that prices would be a common solution to the decarbonisation problem. Rather, European countries have long been used to conducting sectoral analysis informed by the potential for technological change and, in many cases, the introduction of policies like feed-in tariffs designed specifically to accelerate technology penetration and reduce costs through deployment at scale. That said, neither the UK nor Europe have made much sectoral progress on agricultural emissions.

New Zealand is not part of any similar regional effort to develop responses to climate policy and has not previously developed comprehensive sectorally based policies to mobilise opportunities. Indeed, a very low carbon price within an uncapped ETS, along with reliance on forestry sequestration and the purchase of offshore credits, has meant little sustained attention has been paid to domestic emissions reductions. Moving to a UK-style approach of budgets and downstream implementation measures will involve a different approach to policy development, even if New Zealand seeks to rely more heavily on price-based instruments than the UK has. This change will have implications for the skills and resourcing of New Zealand's Climate Commission (see Section 2.2).

1.2 Displaying global leadership

A further difference in the policy context is the part played by ambition for global leadership. The EU and its large industrialised member economies like the UK have long acknowledged their historical responsibility for accumulated emissions. In pushing for an emissions reduction target of –60% by 2050 (deepened to –80% during the enactment process), British parliamentarians bought into a view that can be found in much analysis at the time concerning the need for advanced economies to take the lead in reducing emissions.

The case for leadership was not advanced lightly. Even though the UK is a G7 economy, its policy makers knew that success in curbing global emissions ultimately depends on what happens in large developing economies such as China and India. The 80% target was based on the notion of convergence towards a much lower level of per capita emissions that implied early action by developed economies with the resources to do so.[5] A variety of justifications were offered, ranging from the desire for technological leadership to trying to persuade developing countries to take action as well. Whatever the motivation, there was a well-grounded conviction that if a major G7 economy like the UK couldn't make progress, there was little reason to expect any other country to.

Furthermore, the UK was in a position to provide leadership. The then Prime Minister, Tony Blair, placed climate change at the top of the agenda for the 2005 G8 Summit that was hosted by the UK. In the immediate aftermath, his Government announced a major review of the economics of climate change led by Sir Nicholas Stern with the support of a team of economists from the UK Treasury. The Stern Review, as it became known, played a hugely influential role in making the economic case for climate action and underscoring the case for UK leadership.[6]

As a very small emitter in the global scheme of things, New Zealand has adopted a much lower profile on this aspect of the case for emissions reductions. While New Zealand has acknowledged that small emitters together make up 30% of global emissions and cannot therefore avoid responsibility,[7] it has not to date identified itself as a leader in making the necessary reductions. Whether smallness justifies such modesty is highly questionable. On a per capita basis, New Zealand's emissions are the fifth highest in the OECD, exposing it to the argument that New Zealand is not carrying 'its fair share'.[8]

While there will be sectors where New Zealand is a technology importer and can argue that it is dependent on break-through technologies that are likely to originate abroad, more is likely to be expected of New Zealand in the one field where it is an acknowledged leader – agricultural production systems. New Zealand has taken a leadership role in promoting research cooperation on agricultural emissions and can point to significant productivity gains that have meant a decline in the greenhouse gas emissions per unit of agricultural output.[9] But this has not to date been reflected in New Zealand's ambitions for emissions reductions.

New Zealand may be a much smaller economy than the UK, but it confronts the same reality – that if as a technologically sophisticated society it cannot make progress, it will be hard pressed to make the case that others start the transition to a low emissions economy. An opportunity exists for New Zealand to play an international leadership role in addressing agricultural emissions (something a country like the UK has little incentive to do). To show real leadership, any gains made in research will have to be complemented by real emissions reductions from the agricultural sector. Being able to include agriculture in any targets and carbon budgets will be important evidence of the seriousness of New Zealand's contribution to a global problem. It should also be a source of commercial advantage if new technologies and management systems are exportable. Given the importance of land-based emissions in many developing economies, the sort of leadership New Zealand can provide will be very different from that demonstrated by the UK.

1.3 Acting domestically

In line with the idea of taking global leadership, the UK (like the EU) has taken the view from the outset that the bulk of any mitigation action should be undertaken domestically. This has increasingly become entrenched in international expectations.

The Kyoto negotiations had raised hopes of an ambitious global carbon market. By contrast, the Paris Agreement – while keeping the possibility of 'internationally transferred mitigation outcomes' alive – started from a much more domestically based premise.[10] By securing the agreement of all parties to take action to reduce emissions and instituting a process whereby voluntary national commitments to reduce emissions would be regularly reviewed and updated, the global community committed itself to a fundamentally different 'bottom-up' approach to motivating climate action.

New Zealand was an enthusiastic supporter of this new logic of country-driven action. But it has not over the years matched that with an enthusiasm for domestic action. Between 2008 and 2012 New Zealand met a significant part of its commitment under the first budget period of the Kyoto Protocol by retiring units sourced from overseas.[11] Many of these units are now widely regarded to have been of dubious value in terms of actual emissions reductions (so called 'hot air').[12]

Even if New Zealand is still free to decide how much it will rely on offshore credits, it has to find them. The future availability of credible offshore credits is highly uncertain.

The new architecture will inevitably change the extent to which countries think about mitigation. If all countries are committed to act, there may be less willingness to sell emission reduction credits abroad. In the long-term, if global ambition increases, opportunities to mitigate offshore may become limited or even non-existent.

If that were to happen, the deferral of domestic abatement could end up being even more costly than it need have been. While the UK adopted ambitious targets ten years ago for reasons of global leadership, New Zealand today has sound domestic reasons to do so.

1.4 Emissions trends

It is always easier to set about solving a problem when there are readily available solutions at hand and when taking action runs with the grain of pre-existing trends. This is undeniably the fortunate position in which the UK found itself in the early 2000s. Figure 1 shows that emissions in the UK were steadily decreasing.

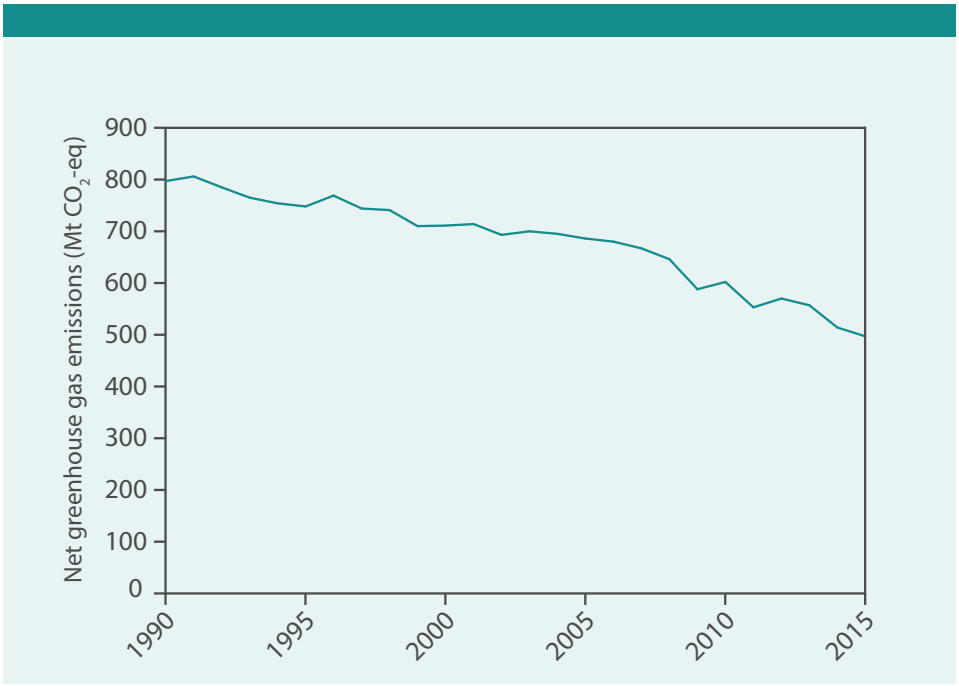


Figure 1: UK net emissions have been on a downward trajectory since 1990.[13]

When the UK Climate Change Act came into force in 2008, UK emissions had been on a downward trend for about 30 years due to the privatisation of the electricity sector in the late 1980s and the subsequent move away from coal to natural gas for electricity.[14] As a result, the UK was already in a good position to make immediate commitments on the first three carbon budgets covering the years 2008–2012, 2013–2017, and 2018–2022. There is debate about how 'easy' these initial short-run budgets were, but they do not appear to have been controversial given that they were consistent with the EU's signalled commitments.

The continued move from coal to natural gas, as well as other policies, contributed to meeting these budgets. Equally so, the effects of the recession that followed the financial crisis made meeting the budgets even easier.[15] The relatively undemanding nature of the initial budgets enabled the new system to be bedded in without immediate controversy.

Only the development of the fourth budget in 2011 highlighted some of the difficult choices that would need to be made. But they affected a time period more than a decade distant – 2023–2027. Requiring governments to make decisions on budgets far in the distance is at the heart of the UK legislation. The budget and the implementation of the policy measures to meet it are decoupled in time, which makes for a debate that is much less rooted in short-run political calculations.

The controversy that attended the adoption of the fourth budget period – notwithstanding its remoteness in time – may be a better guide to what should be expected in the UK going forward than the smooth elaboration of the first three budgets. One researcher has suggested that without the legal and institutional arrangements in the UK Act, a stringent carbon budget for the 2020s would never have been agreed to by the Government.[16]

By contrast, New Zealand's emissions have been on an upward trend since 1990 as Figure 2 (below) shows. Gross greenhouse gas emissions have risen 24% from 1990 levels. Taking into account removals from land use change and forestry, net

Figure 2: New Zealand's net emissions have been on an upward trend since 1990.

greenhouse gas emissions are 64% above 1990 levels.[17] Emissions growth spans most economic sectors with a particularly large increase (68%) from land transportation.[18]

The failure to date to reverse the trajectory of domestic emissions means that from its very first budget period, New Zealand is likely to face some difficult choices. Given the already low carbon-intensity of the power generation sector, New Zealand doesn't have the same easy gains from reducing electricity emissions that many other countries have had available to them.

On the other hand, in the ten years that have passed since the UK Climate Change Act came into force, the urgency of the case for climate action has significantly intensified. Notwithstanding the successful conclusion of the Paris Agreement, the very modest progress made internationally – and the inadequacy of current Nationally Determined Contributions (NDCs) – means there is more pressure to act than ten years ago. This is likely to increase with time. Carbon budgets put in place in New Zealand may have to be more stringent from the outset.[19] This means that the convenient separation of contentious budget setting from immediate policy measures, which the UK was able to achieve by quickly signing off on three consecutive budgets, may be more difficult in New Zealand's case.

This makes the need for a clear understanding of what is being attempted at the outset even more important. The speed with which New Zealand seeks to make up for lost time has to be weighed against the political durability of the policies that are proposed in the short term and the need to provide key industrial sectors with a clear forward path on which they can rely in revising their investment plans.

1.5 Emissions profiles

The emissions profiles of New Zealand and the UK could scarcely be more different. The main difference is that the energy sector in the UK contributes more than 80% of its emissions,[20] whereas approximately half of New Zealand's emissions come from the agricultural sector, and only 40% from the energy sector.[21]

When the UK Climate Change Act came into force, there was very little opposition to the recommendation by the UK Committee on Climate Change to strengthen the 2050 target, from a 60% reduction in carbon dioxide levels to a reduction of at least 80% in all gases. Deepening the target was, in effect, an affirmation that technological transformation could be pushed even further by 2050 than had been initially proposed.

It was not that fully fledged solutions to bridge the entire 80% were on the horizon. But there were reasons to believe that a mix of new renewable technologies, nuclear energy and demand management could go a long way towards de-carbonising the power sector. Furthermore, that clean power sector was seen as the key to supporting the electrification of a wide range of other emission sources (most significantly road transport). For residual emissions, technologies like carbon capture and storage provided a notional backstop. It was a vision of the future that was focused almost single-mindedly on eliminating the combustion of fossil fuel in a traditional, industrialised economy.

New Zealand commences its debate about a long-term target with a more complex emissions profile. The power generation sector is already heavily reliant on renewables. For the energy sector, which accounts for only 40% of emissions,[22] the way forward is,

in principle, going to be similar to that contemplated in the UK, being driven by a mix of supply and demand-side measures that drive fossil combustion out.

But that leaves methane and nitrous oxide emissions, which account for 43% and 11% of gross emissions respectively.[23] Nitrous oxide is a powerful greenhouse gas (around 300 times more potent than carbon dioxide) and one that accumulates in the atmosphere (having a residence time of around 114 years). Because it accumulates, reducing the flow of emissions will not be good enough. To halt its contribution to warming, either emissions have to be eliminated or negative emissions technologies have to be deployed to negate its impact. Nitrous oxide is not just a problem as a warming agent. It is also destructive of the ozone layer, which is where it is ultimately broken down. Given that nitrous oxide makes up a significant and increasing part of New Zealand's emissions, New Zealand will have to consider how it deals with this gas.

By contrast, methane, while a still more potent warming agent than carbon dioxide, has a shorter residence time in the atmosphere before breaking down into carbon dioxide and water. If the source of the methane is agricultural, there is no net injection of carbon dioxide to the atmosphere. Given its shorter lifetime, emitting methane will not have the same irreversible inter-generational warming consequences that carbon dioxide or the release of nitrous oxide have.

The different characteristics of methane do not mean that its warming impact can be ignored. For one, the additional warming caused by methane emissions in the short term can lead to further warming in the longer term from positive climate feedbacks. In addition, it is the combined impact of *all* greenhouse gases, including methane, that contributes to the dangerous and currently increasing amount of warming that is occurring.

There is no easy way to answer how much warming from a short-lived gas like methane we can afford to live with, whereas it is clear that we cannot live with the ongoing accumulation of long-lived gases such as carbon dioxide and nitrous oxide if we are to have any chance of putting a ceiling on temperature increases.

Regardless, carbon dioxide, methane and nitrous oxide are all on an upward trend in New Zealand. Emissions of *all* three gases need to be reduced.

In legislating for a long-term target, New Zealand will not have the benefit of the relatively simple carbon focus that the UK was able to adopt in 2008. While it should be able to chart a path to net zero carbon dioxide emissions, the appropriate long-run treatment of its agricultural gases requires urgent attention. This could mean different targets for different gases; it could also mean restricting the way in which actions in respect of one gas or sink can be used to offset another gas.

The distributional consequences of treating the different gases in different ways could be significant. Understanding these before setting long-term targets in stone would greatly improve the durability of any system of carbon budgets that is developed. More detailed thought on this issue will be particularly important.

1.6 What difference do these differences make?

None of the differences identified above invalidates the usefulness of the UK model in setting long-term targets and providing a process to try to get there. Being aware of them may, however, help focus attention on where some of the challenges may lie. In summary, the UK approach is likely to raise challenges that the UK had already faced or did not need to face to the same degree. For New Zealand this may mean:

- a more comprehensive approach to thinking about emissions reduction policies that will require an understanding of sectoral and cross-sectoral dynamics
- a greater focus on domestic emissions reductions given the likelihood that offshore credits may be in scarce supply
- the need, as a country with deep expertise in agricultural science, to demonstrate that emissions reductions are possible in the land use sector
- a very frank appraisal of what near-term emissions reductions are possible. Given the trajectory of emissions to date, New Zealand is unlikely to be able to conclude three budgets in quick succession that yield 'easy' emissions reductions. On the other hand, it must begin to deploy policies whose impact on investment will make a real difference 15 years from now. Debate over the level of short-term ambition should not be allowed to become an obstacle to settling on ambitious reductions in the medium term. Incentivising these through stable, long-term policies that give investors time to change direction will be critical.
- an urgent and searching enquiry into the treatment of the different gases that make up New Zealand's emissions profile within the context of the high-level Paris goal of 'net zero' in the second half of the century.

Beyond this, I can only underscore my predecessor's earnestly expressed wish that political parties work together to implement a UK-style Act that sets up a long-term framework for addressing climate change. Underwriting a long-term reorientation of the economy away from fossil fuel dependency requires policy stability decoupled from the short-term ebb and flow of politics. Addressing both climate mitigation and adaptation is a long game. It requires a broadly shared commitment to steady progress. Making whatever efforts are needed to secure that shared commitment will be vital to a successful outcome.

Part 2

Elements to consider in the establishment of a Zero Carbon Act in New Zealand

Since the release of the *Stepping Stones* report, the New Zealand Government has proposed putting in place a Zero Carbon Act and establishing a Climate Commission. This chapter builds on the previous report, by laying out key questions that will need to be considered before legislation is enacted and a Commission established.

Five key questions are discussed in the following sections.

1. How should we go about setting a target?
2. What design features will make for a credible Commission?
3. What responsibilities should the Commission have?
4. How can legislation keep successive governments focused on implementing the budgets?
5. Should adaptation be included in the Zero Carbon Act?

My purpose here is to help policy-makers think about each of these questions and identify some of the trade-offs that may present themselves. In some cases, the UK experience is considered in more detail to help inform the discussion. In other cases, New Zealand's different circumstances mean that the UK's experience is less helpful.

2.1 How should we go about setting a target?

The cornerstone of any new legislation will be the enactment of a long-term emissions reduction target.

The UK Climate Change Act not only sets a target, but also a process for amending it. The target can only be amended following parliamentary scrutiny and assent, and only if there are 'significant developments' in scientific knowledge about climate change, or following changes to European or international law or policy.[24] In addition, the responsible Secretary of State must also seek and then consider advice on the target that has been provided by the Committee on Climate Change.[25]

New Zealand has outlined a number of emissions reductions targets over the years. However, none of them are legally binding domestically; there is no requirement in law for the Minister responsible for climate change or anyone else to take any action to meet them.[26] These targets can be amended by the Minister at any time for any reason, without parliamentary scrutiny.

Defining a target in primary legislation would give it greater legal effect than if it were simply created by regulation. Setting out a transparent process for amending a target requiring the disclosure of clear reasons for proposing such a step and seeking parliamentary assent would instil a discipline that would discourage arbitrary changes of ambition in response to short-term considerations. This would in turn underwrite the sort of stable policy environment needed to encourage businesses, investors and consumers to make decisions that internalise the need for long-term emissions reductions.

To make the obligation unequivocal and certain, such a target should be specific. It would ideally be expressed as a percentage reduction of defined greenhouse gases against a baseline year, specifying the year by which these reductions must be made, and stipulating whether emissions are based on gross or net values.[27]

The precise language used in the UK Act to outline the target, and the clearly defined terminology, prevents any interpretation that the target is purely aspirational. As noted by one legal commentator:

> *"Anyone, lawyer or non-lawyer, reading section 1 can readily understand the essential government commitment being made, and the public understanding of these long-term duties and its consequent ability to maintain pressure for political action is not to be underestimated."*[28]

If a target is to be outlined in law, and difficult to amend, then the question becomes: What should New Zealand's target be? This is both a political question and one that is dependent on some very significant scientific judgements. Every effort should be made to find an answer that can command cross-party support. I offer the following observations to those who will be considering this important question.

The starting point for such a consideration must be the commitment made by all countries at the Paris Climate Summit in 2015. The overarching aim of the Paris Agreement is to hold the increase in global temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit it to 1.5°C. To achieve this temperature limit, all countries agreed to aim to *"achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century…"*[29]

Some reference to this internationally negotiated end point seems both legitimate and plausible, given that all parties represented in the current Parliament appear to have endorsed the Paris Agreement. But such a general formulation, intended as a global outcome, is not by itself necessarily very helpful as a legislated target against which to measure domestic progress through progressive budgets. The relationship between international commitments and domestic targets is discussed in Box 1.

As part of the Paris process, New Zealand has committed to a target to reduce emissions 30% from a baseline of 2005 by 2030. While any target that is seriously pursued would be better than a merely aspirational one, 2030 does not really qualify as a 'long-term' target. It is only 12 years away. It is worth recalling that when the UK Act was enacted, its target for 2050 was more than four decades distant. Given the wording of the Paris Agreement – *"in the second half of the century"* – a date later

than 2050, at least for some gases other than carbon dioxide, might be justified if scientific analysis supports it.

But it is not just a target year by which emissions must be reduced that is needed. There is also the matter of exactly what sources and sinks might be required to contribute to 'net zero' in the New Zealand context, and whether they can all be treated in the context of a single timeframe. As many have asked: net zero what?

For reasons outlined in the first part of this report, the UK's target-setting experience doesn't provide much guidance in the New Zealand context. New Zealand's greenhouse gas emissions are made up of approximately 45% carbon dioxide, 43% methane, and 11% nitrous oxide.[30] Each of these gases is very different in its nature, lifetime and potency. Although 'carbon dioxide equivalence' is used to compare these gases, the metric is imperfect. The science on metrics is evolving and can only be expected to further evolve over time.

As a starting point, emissions of all three of these gases have been increasing in New Zealand. There is no doubt that this cannot continue. All sectors will need to play their part if this upward trend is to be reversed. It would also be surprising if a core assumption underlying any target-setting process in New Zealand did not factor in a trajectory towards zero emissions of carbon dioxide from the combustion of fossil fuel. Because carbon dioxide accumulates in the atmosphere, its emission is irreversible in the absence of costly negative emissions technologies. Avoiding these emissions would also focus on the sectors where the greatest current technical potential lies.

Beyond that, a significant source of New Zealand's emissions is the agriculture sector. While their generation is linked to the same land uses, the different gases have very different footprints. Nitrous oxide is long-lived and accumulates in the atmosphere. The same logic that calls for reducing carbon dioxide emissions to net zero applies to nitrous oxide. Methane, by contrast, is a short-lived gas. While it is a potent warming agent, it doesn't accumulate in the atmosphere. So rather than net zero, the challenge may be to establish an acceptable level of emissions.

The proposed Zero Carbon Act for New Zealand needs to define a specific target or targets clearly so that they are not open to interpretation. Determining how the different greenhouse gases should be dealt with and the treatment of removals by sinks are not simple questions, and require careful consideration. They need to take into account the most up-to-date scientific knowledge and should consider the speed and endpoint of reductions for the different greenhouse gases while remaining consistent with the broad goal declared in the Paris Agreement.

Legislating for a single target that covers all gases and treats reductions in one as being as good as another has, at least in theory, the benefit of providing the greatest flexibility in how that target is reached. It is well suited to an ETS in which industries are incentivised to seize opportunities wherever they emerge. This has been the 'first best' textbook approach that New Zealand has long favoured.

On the other hand, by placing all emitters in direct competition for whatever emission rights are available without knowing in advance the marginal cost of abatement, a single target allowing for complete fungibility between gases risks intense lobbying from some sectors pulling down the level of ambition of both the target and budgets.

Separate targets would likely make for a more sectorally segmented approach, thereby reducing the chance that hard cases in particular industries end up restraining ambition across the board. Having separate targets for the different major gases would also provide clarity about the need to make progress on all gases. The attractiveness of this approach might be strengthened if it was concluded that there were different levels of urgency in reducing emissions of different gases. If separate targets were set, they would still, in combination, need to be consistent with the overall ambition required under the Paris Agreement.

While the assessed cost of meeting any targets will be important, care should be taken not to rely too heavily on standard economic modelling in setting them. No one in the UK ever claimed to know with any precision what the costs of meeting its long-term target would be at the time it legislated for carbon budgets. Neither can New Zealand.

Modelling becomes less meaningful the further into the future it looks. We know at the outset that the transformation required will entail technical innovation and changes in consumption patterns that cannot be foreseen or modelled. Equally, we know that well-designed mitigation policies can spur innovation and falling costs. Achievable carbon budgets in the near term are the key to more ambitious ones in the longer term.

My enquiry has not set out to propose a target or targets. This is ultimately for Parliament to decide. But given some of the complexities I have described, I am of the view that Parliament should act on the advice of the new Climate Commission. It will have to shoulder the responsibility of recommending the successive carbon budgets needed to achieve them. It should therefore be fully comfortable with the way the target is constructed.

Taking the Commission's advice before legislating a specific target need not entail a protracted delay and could be achieved in the following way: the Zero Carbon Act could enact an over-arching target to reach net-zero in the second half of the century based on the Paris Agreement along with provisions to establish the new Climate Commission. This high-level goal already enjoys cross-party support. The Act could also require the Commission to advise, within a defined timeframe, on a specific target or targets consistent with the over-arching target, and require the Minister for Climate Change Issues to present that advice to the House of Representatives. Then the Minister could consider introducing amending legislation, which, with Parliament's endorsement, would bring the more specific targets into the Zero Carbon Act.

Box 1: Targets - domestic and international

Setting a target can be a useful way of providing a clear end-point on which policies can be focused and against which progress can be assessed. To be useful, a target has to be crystal clear – otherwise it will be open to interpretation and potentially challenged. In the case of greenhouse gas emissions, a domestic target would ideally be expressed as a percentage reduction of defined greenhouse gas emissions by a specified year in comparison with a baseline year. This is what the UK did in legislating for an 80% reduction in 2050 emissions below their level in 1990.[31]

It is important to understand the way in which domestic target-setting relates to the output of international climate negotiations. These have evolved over the last 20 years. Under the Kyoto Protocol of 1997, countries agreed to bind themselves to specified percentage emission reductions over a 1990 base year by the end of a five-year budget period (2008 to 2012). New Zealand agreed to a reduction to 1990 levels during this first 'budget period'. This was commonly referred to as New Zealand's 'target'. The combined effect of all the negotiated percentage reductions (which covered all so-called developed economies) at the global level was 5.2%.

It was the Kyoto invention of five-year budget periods that was picked up in the UK's legislation, which was being debated at the time the world was preparing for the 2008 Copenhagen climate conference. The Copenhagen conference aimed to strengthen the process launched at Kyoto and devise a system to progressively engage all countries. That attempt failed. While a second budget period covering the period 2013–2020 was negotiated in 2012 at Doha, the number of countries agreeing to be bound by fresh targets diminished. New Zealand was among those countries that did not take on fresh targets.

The idea of negotiating nationally binding targets that extended to all countries withered in the aftermath of Copenhagen. After seven years of negotiations, a fresh basis for making international progress was agreed at Paris in 2015. Rather than negotiate national targets, countries agreed on a system of national pledges (called Nationally Determined Contributions or NDCs) to be followed by five-yearly reviews of progress and fresh pledges of NDCs. The system of top-down five-year budget periods morphed into a system of bottom-up five-yearly pledges.

Importantly, the Paris Agreement was embraced by all countries.[32] It was only possible because the level of any NDCs was not subject to negotiation. An NDC is a voluntary pledge that a country makes in good faith and that it expects to be able to keep. But there is none of the (somewhat utopian) enforcement machinery that was envisaged at Kyoto but never operationalised. At Paris, New Zealand offered as an NDC to reduce emissions 30% from a baseline of 2005 by 2030.

If New Zealand is to legislate for a target, Parliament needs to be clear about the relationship of that target to any commitments it makes internationally. While closely related, they are not the same thing.

New Zealand has signed up to the objective of the Paris Agreement, which is to hold any increase in global average temperature to *"well below 2°C above pre-industrial levels"* and pursue efforts to limit any increase to 1.5 degrees.[33] It has agreed, through the setting up of NDCs, to *"undertake and communicate ambitious efforts … with a view to achieving the purpose of this Agreement"*.[34] Finally, New Zealand has formally concurred with the global need *"to undertake rapid reductions … in accordance with best available science, so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century…"*[35]

Clearly, any future NDCs New Zealand puts forward must be consistent with these key provisions. However, there is no reason why the particular target or targets that New Zealand decides to pursue domestically have to be constructed to meet any particular United Nations Framework Convention on Climate Change (UNFCCC) requirements. They will of necessity be consistent, but their expression and formulation is in New Zealand's hands. Should New Zealand decide to deal with long-lived accumulating gases and short-lived gases in different ways domestically, it is not constrained from doing so by international agreements.

2.2 What design features will make for a credible Commission?

Several features will bear on the credibility of the proposed Climate Commission. These include the calibre of appointments to the Commission and the appointment process; the Commission's access to expertise, evidence and resourcing; and the Commission's initial mandate to generate budgets. These are considered in turn.

The calibre of appointees to the Commission, their expertise and the appointment process

One of the key features being proposed is the establishment of an independent Climate Commission made up of experts as opposed to stakeholders. Ensuring the Commission's credibility will be important to the institution's success over the long-term.

Conversations with UK officials and observers have consistently underlined that the skills and professional authority of those appointed to the Committee, particularly its chair, have proved crucial in establishing the credibility of the Committee. There have been two chairpersons so far – Lord Adair Turner (a former businessman and economist) and the current chair, Lord Deben, a former Conservative Environment Minister. While the Committee's role is technocratic, it makes its recommendations to politicians, whose policies will be subject to intense political scrutiny. As such, officials have remarked to me that its chairperson has to steer a careful path between being too acquiescent and too militant.

To ensure its credibility, the Commission needs to be composed of experts with the skills not just to chart technologically possible paths to emission reductions, but pathways that are economically sustainable. Moving the economy away from the fossil fuel dependent status quo will entail costs. It is vital that these costs are as low as possible whilst still enabling the transition to take place. If costs are unnecessarily high they risk undermining the consensus to proceed down this road.

The Commission must be independent from the Government so that those presenting the Commission's analysis are seen to be clearly at arm's length from short-term political considerations. The Commission must engage with a range of stakeholders, including politicians, to build a clear picture, but its conclusions about carbon budgets should be evidence-based rather than attempting to make political trade-offs that appropriately reside in the political domain.

The expertise of the members of the Commission, and the process by which they are appointed, are important aspects for ensuring credibility.[36]

In the UK, the Committee is made up of a Chair and 5–8 other members. The members are appointed by the national authorities – which includes the Secretary of State responsible for climate change and the Ministers in the devolved administrations. The Chair is also consulted on the appointment of other members. The UK Act also requires the Committee, collectively, to have expertise in climate change science, technology, economics, policy, and business.[37]

In New Zealand, specifying an appointment process and expertise required within legislation is not new. For example, the New Zealand Superannuation and Retirement Income Act 2001 specifies the process that must be followed to appoint Guardians of the Superfund, as well as the expertise required. Guardians must have *"substantial experience, training, and expertise in the management of financial investments"*. To appoint such experts, the Minister of Finance must establish a 'nominating committee'

of at least four people with relevant skills and experience to nominate candidates. The Minister is then required to consult with other political parties before making the appointment.[38]

The nature of this consultation is not specified. Neither does it have to result in all the political parties agreeing on the proposed candidates. The Minister is free to appoint whomsoever he or she wishes to. But the transparency of the process, and the opportunity for political scrutiny prior to appointments being made, will make it more difficult for a Minister to make an appointment that might be seen to serve a particular agenda at odds with the spirit of the legislation.

The Energy Efficiency and Conservation Act 2000 also specifies particular areas of relevant knowledge and experience that the 6–8 members of the Energy Efficiency and Conservation Authority should embrace. They comprise: the energy sector; the environment; community organisations; commerce, marketing, and communications; governance and public sector management; and science and technology. The Minister is required to have regard to the need for a 'balanced mix' of expertise.[39]

In the case of a Climate Commission, there is merit in ensuring that the Commissioners collectively command specialised expertise in climate science, energy and agricultural technology, business and economics, finance and investment, Māori interests, and Te Tiriti o Waitangi.

Given the central importance of the proposed Commission in winning and then maintaining the confidence of the political, business and wider communities, I recommend that legislation not only spells out the array of skills and experience required on the Commission, but also elaborates a transparent appointment process that ensures the involvement of the other political parties.

In this context, I note that the Government has signalled that it intends to appoint an interim Climate Committee to commence background research prior to the passage of legislation and the formal appointment of the Commission. In a small country with a narrow skills base, it appears to me likely that some or all interim appointees will be carried over into the new Commission. If that is indeed the case, I would recommend that the Government apply whatever process for appointment that it intends to include in legislation so there is cross-party confidence from the outset in those charged with undertaking this very important task.

The Commission's access to expertise, evidence and resourcing

Even with the best qualified people in New Zealand on the board of a Climate Commission, their ability to fulfil their role will be limited without the support of a team of skilled analysts and access to expertise beyond the Commission.

Many of the scientists, economists, and analysts with the relevant expertise to fulfil the functions of a Climate Commission may already work in the New Zealand public sector. When the UK Committee was established, many of the secretariat staff members were recruited from agencies across the civil service on this basis.[40]

New Zealand's public service is much smaller than the UK's, and it will be important to ensure that the establishment of a Climate Commission secretariat does not drain other government departments of their expertise.

The Government needs to consider how to invest in building up the capacity and capability of the public sector as a whole (not just within the Climate Commission) to carry out the functions of a future Zero Carbon Act.

In the same way that the board of the Commission needs to be supported by capable staff, the staff must be able to access accurate and comprehensive evidence.

To facilitate information sharing, the UK Committee has developed a Memorandum of Understanding with the Department of Business, Energy & Industrial Strategy that allows it to access departmental data and models in the development of its advice.[41] It will be vital for the Climate Commission and government departments to draw on the same information wherever possible. In this way, analysis and advice, including on carbon budgets, can be anchored in a shared understanding of the evidence base.

During the development of the UK Climate Change Act, the Joint Committee noted that some submitters had raised concerns about the limitations of the existing models, both those held by government and by other organisations. For example, Scottish and Southern Energy submitted that, *"At the moment, the model that has been used for energy projections is very limited in what it can do"*.[42]

These submissions suggest that the UK did not start off with a fully realised set of fit-for-purpose data and models, but rather has had to develop them to meet the needs of the legislation. This has included enabling the UK Committee on Climate Change to commission independent modelling as necessary. New Zealand is likely to be in a similar position, and should not allow the perfect to be the enemy of the good: so long as the gaps in knowledge are identified and addressed, the analysis of the Commission can evolve over time.

Because of the need for a comprehensive evidence base that is shared across the public sector, a New Zealand Climate Commission should play a role in assessing the available data and models, and identifying any gaps. Should the Government decide to develop new models for climate change analysis, the Commission should have input into this process, to ensure that the final product will be fit for purpose.

This position was advanced in the UK Select Committee process by the Financial Secretary (John Healy, MP), who stated that:

> *"If the Committee is finding that in some way [the Department for Environment, Food and Rural Affairs (DEFRA) modelling and analysis] is flawed or got gaps, then we would expect the Committee I think to press those parts of Government which have got some of the analytical modelling responsibilities to up their game and improve what they do."* [43]

The Commission should also be able to commission independent analysis in order to carry out its functions, as is the case with the UK Climate Committee.[44]

Sufficient funding will be needed to ensure high-quality analysis comes out of the Climate Commission. This applies not only to funding the Commission itself, but also to the associated departments and agencies that the Commission will depend upon for its evidence base.

Furthermore, if New Zealand is to meet the targets and budgets set by a new Zero Carbon Act on the advice of a Climate Commission, many departments and agencies will have to develop and implement a suite of new policies and programmes. Resourcing the national evidence base must not come at the expense of policy development capacity.

In this context, the Government should carefully consider the resources made available to the Commission, government departments (including the Ministry for the Environment, Ministry for Primary Industries, Ministry for Business, Innovation and Employment, Ministry of Transport, and Treasury), as well as Crown Research Institutes

such as NIWA, to ensure that New Zealand develops a robust and comprehensive evidence base for climate change, and is well placed to introduce appropriate policy responses.

The UK decided to gather its core climate policy expertise first in DECC (the Department of Energy & Climate Change), and then subsequently in the less memorably acronymed BEIS (Department of Business, Energy & Industrial Strategy). While the department responsible for the environment, DEFRA, leads on climate adaptation, mitigation is squarely in the hands of a core economic agency. After all, the transition to a low carbon economy is at its core an economic challenge.

The UK is not alone in constructing this sort of focus for climate mitigation policy. Australia, France, Greece, Sweden and Denmark have all, in various ways, co-located their climate and energy agencies; in some cases, separated from their environment ministries.

Ensuring a similar policy alignment in New Zealand will be important. However, this must be considered in the context of New Zealand's emissions being approximately half from agriculture and half from energy. Little will be gained if officials dealing with energy, transport, innovation, agriculture and forestry have different views about the relative priority of mitigation policy. The 'transition hub' hosted by the Ministry for the Environment could be developed to become a dedicated cross-agency node to ensure that climate mitigation is unequivocally mainstreamed into all relevant government policies.

The Commission's initial mandate

As noted in Part 1, the UK Climate Committee was mandated to generate the first three budgets at the same time. Given the UK's downwards emissions trajectory and the direction of the umbrella EU policy, this was not a particularly controversial exercise. It arguably made it easier for the Committee to establish itself before confronting its first controversial recommendations (those recommending the fourth carbon budget).

New Zealand will be unable to capitalise on a favourable emissions trend that allows debate over difficult choices to be confined to budget periods well out in the future. As a result, expectations about the first budget periods will need to be carefully managed. It will be important that arguments over the ambition of the first two or three carbon budgets do not become an obstacle to subsequent budgets. The whole point of the UK model is to send a clear signal about medium- and long-term expectations to provide certainty for those making long-lived investments that need to be consistent with a low-carbon pathway. Carbon budgets for the post-2030 period are needed soon if New Zealand's long-run emissions trajectory is to have a chance of being steered onto a pathway consistent with the net zero goal.

2.3 What responsibilities should the Commission have?

The responsibilities of New Zealand's Climate Commission will need to be clearly set out in the Zero Carbon Act to provide the Commission with a firm mandate from which to operate. The following section outlines key areas that should be carefully considered prior to drafting the Act.

Responsibility for determining carbon budgets

In the UK, while the Committee on Climate Change has many significant advisory functions relating to carbon budgets, it has no executive functions. During debates on the UK Climate Change Bill there were calls for the Committee to have more executive functions, including the power to set budgets. This was explicitly dismissed by parliamentarians:

> *"The history of the Bill demonstrates the importance of ensuring that we have a democratically accountable system that responds to public demand for action. If the Committee on Climate Change were responsible for taking decisions, how would it be accountable to the public? For instance, if the public wanted to reduce emissions more quickly than the committee, how would they ensure that the committee listened? Could they vote the committee out of office? Obviously not."*[45]

In deciding the size of carbon budgets, the responsible Secretary of State must take into account advice from the Committee on Climate Change, but remains the ultimate decision-maker and is required to formalise the budget through a Carbon Budgets Order.[46] There is the possibility of a debate on the proposed Order. The budget will not come into force unless it is approved by Parliament.[47] If the Secretary of State proposes a budget that does not confirm the advice of the Committee, the Secretary of State must provide reasons.

In addition to advising on the level of carbon budgets, the UK Committee is required to provide advice on more specific issues associated with each budget, including:

- the extent to which domestic reductions and international credits should respectively be relied on in achieving that budget
- the respective contributions of sectors covered by emissions trading schemes and those not covered by trading schemes in meeting the budget
- those sectors of the economy that offer particular opportunities for reductions in emissions[49]
- the consequences of including emissions from international aviation and international shipping in budgets.[50]

Again, these matters must be taken into account by the Secretary of State but do not bind the Government in deciding how to go about developing policies designed to meet a budget.

In my view, the UK legislation divides the responsibilities between a non-elected expert body and an elected government in a way that makes sense. Given that it is the Government that has to develop and implement the policies that will be needed to bring emissions within the budget, it must whole-heartedly endorse and stand behind it. These policies will have real effects on the economy, and the Government has to be able to account to households and businesses for the choices it has made (bearing in mind that there is no unique, pre-determined policy mix that will necessarily achieve a given emissions outcome).

I have been unable to identify any precedent internationally for independent bodies setting carbon budgets or targets. In my view the status of budgets proposed by the New Zealand Climate Commission should be advisory. That advice should also extend to the extent to which the Government should rely on domestic reductions and the use of international credits for a given budget period. This advice would not bind the Government in its use of offshore credits. Along with the overall size of the budget, that would be a matter for the Government to determine.

It follows from this that the number of credits available under the ETS would similarly be determined by the Government as part of its policy implementation responsibility. Obviously the Commission would need to have a detailed understanding of the operation of the ETS, including the likely price effects of any curtailment of available permits or the necessity for a floor price in recommending a budget. But these parameters are essentially no different from any other policy intervention, and need to be decided as part of the overall policy mix the Government deploys to meet a budget once it has been accepted and approved by Parliament.

While giving the Commission a decision-making role in ETS settings could help to bolster stability and predictability in the carbon market, there will inevitably be trade-offs that require political accountability, such as free allocations given to different sectors and the speed with which these are phased out. Instead of giving the Commission a decision-making role, the Zero Carbon Act could require the Commission to provide advice prior to any change a Government might seek to make to ETS settings.

Responsibility for policies designed to meet carbon budgets

During the passage of the UK Climate Change Bill there was also debate on whether the Committee should make recommendations on what future emissions reduction policies should be introduced by the Government to meet carbon budgets. This role was rejected by parliamentarians, as giving practical effect to the Committee's advice was seen to sit squarely with elected representatives.

> *"For the advice to be credible, it must be formulated outside the political arena and therefore above decisions on the particular choice of policy mechanisms… We could take, for example, the question of nuclear power. The Government have set out their position. We know that there are a range of views within the country on the issue but it is important that the Government are held accountable by Parliament and the people for their decisions on matters such as this. We would not want the Committee on Climate Change to be responsible for these sorts of decisions."*[51]

This does not mean that the Committee is blind to policy. Scenarios developed by the Committee have to assume some policy parameters to deliver persuasive advice on carbon budgets. Further, in providing advice on budgets, the Committee provides its assessment of the most cost-effective route to achieving budgets and has been known to press the Government to publish the extra costs the community will bear as a result of more expensive policy choices being taken.[52] But the Committee stops short of prescribing which measures should or should not be implemented.

Recommending the policies that should be implemented to meet budgets is a task that is of an essentially different nature from the techno-economic, sector-by-sector assessment the Climate Commission would carry out in recommending budgets. Policy makers operate within different constraints from those that would govern the Commission. Given that they will be held politically accountable for their implementation policies, they should not be constrained in the choices they make. This wouldn't preclude the Commission, like the UK Committee, playing an important advisory role in identifying those sectors of the economy that offer particular opportunities for emissions reductions.

2.4 How can legislation keep successive governments focused on implementing the budgets?

The purpose of a Zero Carbon Act, as is proposed in New Zealand, is to provide an over-arching framework within which policies to reduce emissions can be given a stable, long-term focus, mainly through an iterative process of analysis and response between the Climate Commission and the Government.

This section explores the extent to which the procedural hoops erected in the UK legislation have kept governments focused on implementing the budgets they have asked Parliament to adopt, and whether any refinements could improve the chances of success in New Zealand.

The UK Climate Change Act 2008 essentially outlines a process without any legal enforcement mechanism. As one legal commentator put it:

> *"The core philosophy of the Act is that this series of built-in duties, actions and reporting requirements … will create transparency, accountability and political pressure to ensure that governments will comply."*[53]

The closest the UK Act gets to ensuring implementation of emissions reduction policies is in requiring the UK Government to set out transparently the proposals and policies it will use to meet the carbon budgets, including the timeframes over which those proposals and policies are expected to take effect, and what impact they will have on different sectors of the economy.[54]

The importance of this obligation in the overall effectiveness of the carbon budget system should not be underestimated. An understanding of the timeframes of Government policies is important for the commercialisation of key technologies, the development of necessary infrastructure, changes in consumer behaviour, and the development of markets for new technologies.[55]

In recent years, however, the UK Government's implementation performance has been criticised. While the fifth carbon budget was set in July 2016, it had been apparent for some time prior to that that the policy measures announced in response to the fourth budget were already inadequate to meet it. In the view of one commentator, the Secretary of State has been in legal breach of section 13 of the UK Act for some years in failing to remedy this 'policy gap'.[56]

In addition, the UK Act does not set out an explicit timeframe within which the UK Government must set out its policy proposals. It is merely provided that this must be done 'as soon as is reasonably practicable' after setting each carbon budget. So it was not until October 2017 that the UK Government released a Clean Growth Strategy, representing its 'proposals and policies' to meet the fifth carbon budget as well as remedy the shortcomings of the fourth.

This lengthy delay in providing a response caused the Committee to note in its June 2017 annual report to Parliament:

> *"The UK urgently needs new policies to cut greenhouse gas emissions. Parliament has made commitments and the Government has a legal duty to propose policies to meet them … Climate change will not wait while other priorities are addressed: plans must be published without delay, setting out how the Government intends to deliver the budget, which requires a 57% reduction in greenhouse gas emissions from 1990 to 2030."*[57]

In January 2018, the Committee released an assessment of the Government's Clean Growth Strategy, concluding that:

> *"Even if delivered in full, existing and new policies, including those set out in the Clean Growth Strategy, miss the fourth and fifth carbon budgets by around 10–65 $MtCO_2e$ – a significant margin."*[58]

If the proposed Zero Carbon Act in New Zealand followed in a similar vein, it would put in place a process that would encourage emissions reductions, but not actually ensure them. In theory, a target outlined in the Act and carbon budgets set under the Act are legally binding and the duties set out in the Act would be enforceable in a court of law. The UK Act has yet to be tested in this regard. However, the use of unqualified and clear language in setting out the Secretary of State's duties in the UK Act adds weight to the argument that the duties are capable of effective legal enforcement.[59] The ability for New Zealand courts to scrutinise the Zero Carbon Act will be an important part of the overall system of accountability the Act establishes and should be carefully considered in the drafting of the legislation.

If there is a weak link in such a model it is on the implementation side. There is no easy way to compel governments to act in a way that is consistent with budgets. But this is inherent in an approach that leaves core economic and social policy decisions, and accountability for them, in the hands of elected representatives. If public interest groups pursued judicial review on the basis that there was a policy gap, they would still have to convince the courts that the gap was not a legitimate deferral of action in respect of policies that need to influence an emissions outcome in a period that may still be some years away.

It may be perfectly reasonable to leave options open ten or more years in advance of a budget period, but as that budget period draws nearer, the inadequacy of policies will progressively suggest that it is implausible that the budget will be met. At a certain point, the ongoing generation of emissions budgets that stand less and less chance of being met would, if allowed to continue, undermine the credibility of the entire system. The emperor would be found to have no clothes.

The UK Climate Change Act is still relatively young and has yet to be tested in a number of respects. While a legal challenge would be one test, another would be difficulty getting a carbon budget enacted by Parliament. The fact that the fourth and fifth budgets have been adopted and voted by Parliament can be regarded as evidence that the Act is working and the parliamentary consensus on which it relies is intact.

But looked at from another point of view, the fact that there has never been a robustly divided debate on a proposed budget could be regarded as evidence of short-termism of a completely different variety: it may be too easy to agree to something whose consequences lie well beyond the life of the current parliament (and potentially beyond the retirements of many Members). The same applies to governments: doubts about a

proposed budget may be more easily set aside if the consequences will ultimately fall on a future government.

None of this is a reason to suggest that the model the UK has elaborated is deficient. Rather, it is to underline the challenges of expecting a government elected for the short-term to bind itself to the management of a long-term challenge of a type governments have never previously had to face. In the end, the iteration of advice and response between the Government and the Climate Committee is about institutionalising a requirement that public policy remains focused on the long-term and that the Government is required to be transparent about its policy intentions. It is a way of managing a risk that is unfolding over a timescale dislocated from any that our political systems have traditionally been designed to deal with.

In my consideration of the UK's experience, I have identified three procedural steps that might maintain a more consistent pressure on governments to keep their eye on carbon budget compliance.

In the first place, legislation should consider providing a more definite timetable for the publication of a statement of implementation measures than the 'as soon as is reasonably practicable' formula adopted in the UK legislation. Given that the process for developing and adopting budgets conforms to a regular cycle, there is no reason why a Government cannot announce its proposed policy measures within a defined period; for example, six months.

It is worth underlining here that this does not necessarily mean a massive, comprehensive policy smorgasbord all in one hit. It could involve the announcement of some explicit measures with an equally explicit statement that other measures would follow within further specified timeframes or (in respect of budgets covering periods a decade or more away) even a frank admission that some elements remain to be determined. The frank admission of a future 'gap' (something the UK has now lived with for some years) would be preferable to a vague policy package that pretends to an effectiveness that does not stand scrutiny.

Secondly, it is clear that following the acceptance of the fourth budget in the UK, the Government then set about taking a range of measures that were significantly at odds with any emissions reduction strategy. They included subsidies for new oil and gas investment in the North Sea, tax breaks for shale gas development, blocking the addition of a decarbonisation target from the Energy Bill (2012),[60] the removal of energy efficiency subsidies for housing,[61] and the cancellation of funding for developing commercial scale expertise in carbon capture and storage.[62]

While these were perfectly legitimate government actions, there was no requirement to explicitly and transparently communicate the consequences of each policy measure for the likelihood that future carbon budgets would be met. Requiring such a communication would not necessarily have prevented the policy reversals, but it would have brought Ministers face to face with the potential for policy incoherence.

The New Zealand Government has signalled its intention to require all new legislation to have a climate impact assessment.[63] This would be a positive development, but the Government should extend the assessment to all new policies. Such an impact assessment would not be without precedent – there is an existing requirement that regulatory impact statements are provided to Cabinet when there is a proposal to create, change or repeal legislation or regulations by the relevant government department. The new climate assessment should quantify the impact (positive or negative) of a proposed policy change on future carbon budgets and targets.

Finally, it may be worth considering whether the Government should only have to turn its mind to the adequacy of its overall policy response once every five years. A very wide range of policy domains can have an impact on emissions outcomes, and many of these are constantly evolving. Some way needs to be found to ensure that policy makers remain aware of the consequences of their actions between formal budget-setting processes.

Conversations with officials operating the UK system revealed a concern that the gap between budgets being prepared and adopted, together with the inevitable turnover of policy makers and officials, can mean that the Climate Committee is in some cases having to start from scratch in raising the profile of the issue. This potential for disconnection is likely to be exacerbated in respect of budgets designed to meet time periods well into the future which at the time of their adoption are dislocated from immediate political consequences.

This is, of course, exactly what the forward-focused nature of budget-setting is designed to achieve. It may be, however, that a more frequent exposure of the potential for a gap between the adequacy of policy settings and the required emissions trajectory would be useful to ensure that the need to stay on track doesn't fall off the political radar screen.

The timing of carbon budgets may also need to be considered in the light of New Zealand's very short election cycle. The five-year span adopted in the UK appears to have grown out of the timing of budget periods adopted under the Kyoto Protocol. It also, coincidentally, matches the length of a UK Parliament. Given the significant effort required to develop a budget, a shorter cycle would be unlikely to be attractive. Equally, a longer one could exacerbate the loss of policy momentum following the completion of a new budget, already noted in the UK. A six-year budget with an intermediate review of the adequacy of the policy setting could provide a way to balance longevity with the need to maintain momentum and the pressure of scrutiny by the Commission. It would also fit New Zealand's three-yearly election cycle.

2.5 Should adaptation be included in the Zero Carbon Act?

While the principal focus of a new Zero Carbon Act is to set up a process for reducing emissions, the impacts of climate change cannot be avoided.

Some regions in New Zealand are likely to suffer more droughts and water scarcity. Others may experience more river and surface flooding and a heightened risk of landslides during intense rainfall events. Some coastal areas will experience more erosion and flooding from sea level rise. Changing temperatures and weather patterns will affect agricultural productivity. They will also, coupled with increased ocean acidification, affect the productivity of the marine environment on which the fishing industry depends. Both the terrestrial and marine environments are likely to be challenged by new invasive species and diseases.[64]

In addition to these physical and economic impacts, climate change is also likely to increase the likelihood of refugees seeking shelter from climatic stress in more severely affected regions, including the Pacific Islands.

All of these impacts will have significant economic consequences that can only be avoided with foresight and planning.

Adapting to these impacts will require change in the way that the country makes decisions and plans for development, invests in infrastructure, and manages natural hazards, among other things. While the responsibility for adapting to climate change is

at present largely devolved to local government in New Zealand, it will also need to be considered in national planning and investments. Adaptation will have an impact on decision-making at both central and local government level, as well as decision-making within communities, by iwi, businesses and individuals. Any approach to adapting to the impacts of climate change needs to be coordinated across these many actors. An efficient and forward-looking approach demands joined-up thinking at the national level to avoid different actors re-inventing the wheel from region to region.

Many countries have adopted national adaptation strategies as a way of promoting efficiency and coherence in adaptation planning. These typically outline a country's broad approach to adaptation, outline roles and responsibilities, and facilitate coordination, while still allowing flexibility in what measures are implemented in specific areas and flexibility to reassess the risks as more information comes to hand. Many countries have gone on to produce or start developing national adaptation plans that outline specific policies and interventions that will be implemented.[65]

Four components are considered to be important for effective adaptation planning. They are acknowledged in Article 7.9 of the Paris Agreement.[66] The four components are as follows:

- Assessing risks and identifying priorities through risk and vulnerability assessments
- Developing plans that set out concrete policies and measures for addressing adaptation
- Implementing policies and measures outlined in the plans
- Assessing progress of implementation of adaptation measures using a series of indicators that measure changes in exposure to climate change, the effectiveness and cost-effectiveness of specific adaptation measures, and socioeconomic changes [67,68]

The UK Climate Change Act sets out a process for adaptation based on these components (see Box 2). It ensures that, on a routine basis, risks are assessed, plans are developed, and progress towards those plans is measured. The legislation does not, however, require the Government to implement policies, though it should be clear through progress reporting when progress on adaptation is not being made.

A process like this will work best if there is strong coordination across all levels of government. It also requires adequate resourcing (including, critically, investment in the evidence base) and a process to raise awareness in communities and across business sectors. If it is well designed, an adaptation strategy will mean that adaptation-relevant considerations are routinely considered in Government decisions.[69]

The UK has done well on some of these fronts. For example, awareness within organisations has grown as a result of the UK Government choosing to exercise its 'adaptation reporting power' under the UK Climate Change Act. By doing this, the Government required public bodies to consider how climate change would affect them and report on that.[70] Likewise, in policy setting the UK Government requires all government departments to identify risks from climate change.[71] On the other hand, the Climate Committee's Adaptation Subcommittee has concluded that adaptation has not been sufficiently funded or prioritised at the local level in recent years.[72]

Box 2: Adaptation in the UK Climate Change Act

As was outlined in the *Stepping Stones* report, the UK Climate Change Act also sets out a process for adaptation. The adaptation process outlined in the UK Act has four elements:

- A *Climate Change Risk Assessment* of the risks and opportunities that climate change poses to the UK is completed every five years by the Government. The Adaptation Subcommittee provides advice on this assessment no later than six months before the assessment is due.[73]
- A *National Adaptation Programme* outlines the actions that the Government, business and society will take to adapt to climate change. This to be completed every five years by the Government, and released as soon as is reasonably practicable after the preceding risk assessment has been completed.[74]
- A *review of progress* on how effectively the National Adaptation Plan is being implemented. This is completed every two years by the Adaptation Subcommittee, and the UK Government must respond to the points raised in the review.[75]
- The *Adaptation Reporting Power* enables the Government, if it chooses, to require public sector organisations to report on how they are likely to be impacted by climate change, and how they are addressing the risks and opportunities of climate change.[76] This is not solely about adapting to the physical risks of climate change, but also the financial risks posed by, for example, assets that may be stranded by the impacts of climate change.

The proposal to enact a new climate change law and create a new Commission in New Zealand makes this an opportune moment to consider whether a fresh approach to managing adaptation risks is merited, and if so, whether it should be included in the new Act and/or be overseen by the new Climate Commission. New Zealand is one of a small number of OECD countries not to have developed a national adaptation strategy.[77] Now is the time to revisit this issue.

Developing a strategy could go some way to ensuring that good science is available for decision-makers, that effort is being focused on priority issues, and that information is shared so that each council doesn't have to reinvent the wheel.

Central government is funding research to improve understanding of the impacts of climate change on New Zealand and adaptation solutions. Current research funding supports the Natural Hazards Research Platform, the Sustainable Land Management and Climate Change programme, and the National Science Challenges, including the Deep South Challenge, involving researchers from across the country.

Recent advice from the Government's Adaptation Technical Working Group concluded that effective adaptation responses would require better alignment in legislation, planning and processes, and coordination across the many different agencies and councils.[78] The need for alignment and coordination is also well-recognised internationally.[79]

While a more focused, coherent national strategy for adaptation would be helpful, it remains an open question whether such a strategy should be instigated through the proposed Zero Carbon Act for New Zealand. Interviews with UK sources suggest some ambivalence about whether the effectiveness of the UK's approach to adaptation has necessarily been any better because it has occurred under the wing of the Climate Committee. In the light of experience, the most compelling reason advanced for linking both mitigation and adaptation responsibilities was the desirability of having a joined up narrative about mitigation and adaptation. They are evidently closely linked,

where some actions to reduce emissions will affect the ability to adapt, and vice versa. Therefore, one could imagine the New Zealand Climate Commission hosting an adaptation committee along the lines of that developed in the UK legislation. On the other hand, such a committee could be hosted elsewhere.

Before making this decision, Parliament should consider whether an independent Commission could add value in terms of adaptation, whether there is currently sufficient capacity and adaptation expertise to staff a Commission as well as government departments, and how such a role would mesh with the Commission's mitigation role given the differences in expertise.

The UK Adaptation Subcommittee plays two roles. The first is providing advice to the UK Government on the climate change risk assessment that is completed every five years. In practice, the Adaptation Subcommittee completes the risk assessment for the Government, playing something of a facilitation role in bringing together a number of experts from across the UK to develop their advice on the climate change risk assessment.

Regularly assessing risks and identifying priority issues will be important for determining where to focus adaptation efforts in New Zealand. However, such a role could be facilitated by the Ministry for the Environment in collaboration with Crown Research Institutes such as NIWA.

The second role that the UK Adaptation Subcommittee plays is in reporting every two years on the progress made on adaptation. Such reporting has two purposes:

- to learn how adaptation measures are working in practice to improve their effectiveness, and
- to provide transparency and accountability.

For accountability purposes, there may be good reason to have such a role carried out independent of Government. However, many countries have government ministries or departments carry out such a role as opposed to an independent body, and not all focus on both of these purposes.[80]

In New Zealand, such a monitoring role could be carried out by a team within the Ministry for the Environment that works separately to the Ministry's adaptation policy team and adaptation policy teams from other Ministries. Such a team could work in a similar framework to that used for environment reporting, whereby it reports under the supervision of the Secretary for the Environment rather than a Minister.

Whatever the architecture chosen, New Zealand needs to conduct national risk assessments and maintain a national adaptation strategy. This should include a process for monitoring progress on adaptation. Provision for these should be included in the Zero Carbon Act. Which agency should take responsibility for them is not a matter on which I have a strong view. The key point is that the Government should designate such an agency.

A clearly developed strategy could usefully align already existing elements of the Government's work programme, including work on natural hazards and work by the Treasury's National Infrastructure Unit, and link these to the all-important work of regional and local councils, who are at the front line in confronting impacts that are already having to be adapted to. Such a strategy should be updated routinely, factoring in progress in reducing vulnerability and exposure, and as new scientific information comes to light.

Part 3

Summary and Recommendations

My predecessors have traditionally investigated issues of concern and then crystallised their analysis in recommendations, sometimes to the Government as a whole, sometimes to specific Ministers and agencies.

This report is a little different. The new Labour-led Government is proposing a Zero Carbon Act and an independent Climate Commission broadly following the line of my predecessor's recommendations in July last year. In making her proposals, Dr Wright urged all parties to come together to pass the necessary legislation. I can only repeat the desirability of securing cross-party consensus for establishing a process to tackle one of the greatest inter-generational issues of our time.

For this reason, I am directing most of my recommendations to Parliament as a whole. If a parliamentary consensus can be reached on the best way forward, a different way of making and amending policies will emerge – regardless of who for the time being makes up the Government. For that reason, many of my recommendations are about the way in which processes are designed to try to keep the focus on the long-term.

I have sought to highlight some of the challenges and trade-offs that will need to be considered in developing a Zero Carbon Act that accounts for New Zealand's particular circumstances. These insights and recommendations are summarised in the following sections.

Much of what I have recommended stems from differences between circumstances in the UK leading up to the passing of its Climate Change Act in 2008, and the particular New Zealand context in which we seek to achieve the same ends. While there are many constitutional similarities between our two countries, there are important differences in our particular emissions challenges that need to be taken into account if the proposed legislation is to be successful and durable.

3.1 How should we go about setting a target?

If I have one recommendation that may seem to go beyond matters of design and process, it is that which concerns setting an emissions reduction target. It is at the core of the UK's legislation and will be unavoidably so in any New Zealand counterpart. Because targets and timetables to meet them have real economic and social consequences, setting them has the potential to be very contentious. So the way Parliament goes about enshrining targets in legislation could be very important.

I have detailed several ways in which the UK's and New Zealand's circumstances diverge. Several of these suggest that the process of setting succeeding carbon budgets – 'stepping stones' in my predecessor's language – may be more challenging than that encountered in the UK, at least at the outset.

In one important respect, however, New Zealand starts with a more favourable international context. While the sponsors of the UK Climate Change Act saw themselves holding the torch of climate leadership as they set about developing their legislation, its enactment came on the eve of the failure of the Copenhagen climate summit and the biggest financial crash in two generations. It turned out to be a less than auspicious moment.

New Zealand, by contrast, contemplates legislation following the remarkable progress towards global action taken at the Paris climate summit in 2015 and as the global economy is finally returning to a solid growth path. Indeed, the scale of the required transition to a low carbon economy is a huge potential source of growth and employment as infrastructure is re-wired and completely new ways of doing business are pioneered. It should be a much more optimistic moment to commit to long-term action.

Even more importantly, as a result of the Paris Agreement, there is broad cross-party support for the Paris goal of 'net zero in the second half of the century'. So there is a solid starting point for gaining agreement on what sort of target to legislate. But any long-term target or targets will need to be more precisely defined if they are not to be open to interpretation.

New Zealand's atypical emissions profile makes this even more important.

The development of more specific targets consistent with the over-arching Paris goal should be based on the most up-to-date scientific knowledge, and should consider the speed and endpoint of reductions for the different greenhouse gases, as well as the treatment of removals by sinks. This will require careful analysis.

1. **For this reason I recommend that Parliament should tackle the issue of the target in a staged way so that it can request and consider advice from the new Climate Commission.**

In the first place the Zero Carbon Act could enact an over-arching target to reach net-zero in the second half of the century based on the Paris Agreement along with provisions to establish the new Climate Commission. This high-level goal already enjoys cross-party support. The Act could also require the Commission to advise, within a defined timeframe, on a specific target or targets consistent with the over-arching target, and require the Minister for Climate Change Issues to present that advice to the House of Representatives. Then the Minister could consider introducing amending legislation, which, with Parliament's endorsement, would bring the more specific targets into the Zero Carbon Act.

3.2 What design features will make for a credible Commission?

Winning and maintaining the confidence of the political, business and wider communities will be key to establishing the credibility of the proposed Climate Commission. An appointment process with buy-in from across the different political parties, and the appointment of experts rather than stakeholders, will go some way to securing this confidence.

The Government has indicated that it intends to appoint an interim Climate Committee to commence background research, prior to the passage of legislation and the formal appointment of the Commission. A similar approach was adopted in the UK and makes good sense.

In a small country with a narrow skills base, it is likely that some or all interim members will be carried over into the new Commission. It is important that the process used to appoint any interim Commissioners enjoys the same confidence as that legislated for the Commission itself.

2. **I recommend that the Zero Carbon Act should specify the expertise required on the Climate Commission and a process that ensures some level of cross-party consensus in the appointment of the Commissioners.**

3. **Further, I recommend that if the Minister for Climate Change Issues establishes an interim Climate Committee to make early progress, he should follow the same appointment process I have recommended for inclusion in the Zero Carbon Act.**

The Government must also ensure that the Climate Commission is sufficiently well resourced to deliver high quality analysis. The Commission's relationship with government departments will be important for ensuring access to data and Government models, but funding must permit the Commission to commission work and access models external to the Government.

Further to that, the Government must ensure that government departments are sufficiently resourced to develop and implement the policies that will be needed to meet future carbon budgets.

Given that climate change is a cross-sectoral issue, the Government also needs to consider how the many relevant government agencies will work together to deliver on budgets and targets. Coordination is not a simple task. In May 2017, the previous Government provided funding for a Transition Hub, hosted in the Ministry for the Environment, to look at the costs and benefits of the policies needed to effect a transition to a low carbon economy. The Hub currently has staff from government departments in the natural resource sector. The Transition Hub has the potential to take on a broadened remit to provide cross-agency coordination for all climate mitigation policy. This could include staff from the relevant government agencies being seconded to the Hub.

4. **I recommend that the Government should broaden the remit of the Transition Hub as a team that works across departments to ensure coordination on climate policy, and that this 'hub' be resourced accordingly.**

3.3 What role and status should the Commission have?

Before passing the Zero Carbon Act, consideration needs to be given to what the Climate Commission's mandate should be.

In the UK, the legislation clearly divides the responsibilities between the Climate Committee and the Government when setting budgets. The non-elected Committee provides advice, while decisions are made by the elected Government and ultimately approved by Parliament. Given that it is the Government that has to develop and implement the policies that will be needed to bring emissions within the budget, it must whole-heartedly endorse and stand behind the budget and the policies it will implement. These policies will have real effects on the economy and potentially trade-offs between sectors, and the Government has to be able to account to households and businesses for the choices it has taken.

When it comes to ETS settings, giving the Commission a decision-making role could help to bolster stability and predictability in the carbon market, but there would be inevitable trade-offs that require political accountability. No other ETS in the world has an independent body making decisions on ETS settings. However, one option that could be considered is introducing a safeguard in the Zero Carbon Act whereby the Commission's advice would be required prior to any change a Government might seek to make to ETS settings.

5. **I recommend that the Zero Carbon Act should give the Climate Commission an advisory role, and that responsibility for bringing a budget to Parliament for enactment and implementing the policies needed to achieve that budget should lie with the elected government of the day.**

The advice the Climate Commission provides should also extend to the extent to which the Government should rely on domestic reductions and the use of international credits for a given budget period.

6. **I recommend that the Zero Carbon Act should require the Commission, in advising on carbon budgets, to include advice on the extent to which emissions reductions should be effected domestically as distinct from secured through the purchase of international credits.**

3.4 How can legislation keep successive governments focused on implementing the budgets Parliament has endorsed?

The purpose of putting in place a legislative framework on climate change is to set up a clear and transparent process. While such a process encourages emissions reductions, it cannot ensure them. This is inherent in an approach that leaves policy decisions, and accountability for them, in the hands of elected representatives.

Governments in the UK have not always pursued policies that are aligned with the budgets they have recommended for adoption. Learning from this experience, there are several areas where the process outlined in the proposed Zero Carbon Act could be tightened to put more focus on implementing policies to reduce emissions.

In the first place, legislation should consider providing a more definite timetable for the publication of a statement of implementation measures than the 'as soon as is reasonably practicable' formula adopted in the UK legislation. Given that the process for developing and adopting budgets conforms to a regular cycle, there is no reason why a Government cannot announce its proposed policy measures within a defined period.

7. I recommend that the Zero Carbon Act should:

    a. lay out an explicit timeframe – possibly six months – within which the Government must publish a report detailing the policies it intends to implement in response to a newly enacted carbon budget

    b. require Ministers to publish an assessment that quantifies the impact (positive or negative) on future carbon budgets or targets of any proposed policy changes.

Thirdly, there is the question of how frequently budgets are prepared and policy implementation is reviewed and updated by the Government. The UK legislation requires a carbon budget to be set every five years, with the Government then required to outline the policies it will adopt to implement each budget. The five-year span adopted in the UK appears to have grown out of the timing of budget periods adopted under the Kyoto Protocol, but it also happens to match the length of a UK Parliament.

A five-year gap between budget adoptions has been criticised as being too long to maintain political engagement. A shorter timeframe would be more likely to ensure that policies remain fit for purpose and are regularly updated if they are found to be falling short. On the other hand, given the significant effort required to develop a budget, a shorter cycle of budgets could be unattractive.

A lengthening of the carbon budget cycle to six years could, however, be a possibility if coupled with an interim update and review of policies by the Government after three years. This would also have the advantage of being able to match the New Zealand electoral cycle. If budgets were brought down in the first year after an election and reviewed in the year following the succeeding election, there would be a three-yearly opportunity for governments to take stock and Parliament to review progress.

8. I recommend that the Zero Carbon Act should provide for carbon budgets to be developed and adopted every six years, together with the requirement for an interim update and review of policy implementation by the Government three years after each budget is adopted.

3.5 Should adaptation be included in the Zero Carbon Act?

The proposal to enact a Zero Carbon Act and create a Climate Commission in New Zealand provides an opportune moment to consider whether a fresh approach is needed for managing adaptation risks.

New Zealand is one of a small number of OECD countries not to have developed a national adaptation strategy. Developing a strategy could go some way to ensuring that good science is available for decision-makers, that effort is being focused on priority issues, and that information is shared so that councils are not engaged in reinventing the wheel.

The Zero Carbon Act is a logical place for outlining a process for managing adaptation risks, and has the benefit of promoting a joined up narrative about mitigation and adaptation. However, it remains an open question whether a Climate Commission should play a role in this.

Careful consideration needs to be given to the pluses and minuses of involving a Commission in such a process for adaptation, including risk assessment, the identification of priority issues, and monitoring progress on adaptation.

9. I recommend that the Zero Carbon Act should include a process for carrying out regular national-level risk assessments and national adaptation strategy planning (whether or not these are to be conducted by the Climate Commission).

Notes

1. Parliamentary Commissioner for the Environment. 2017. *Stepping stones to Paris and beyond: Climate change, progress, and predictability* (p. 3).
2. House of Commons, Hansard Debate, 28 October 2008.
3. Parliamentary Commissioner for the Environment. 2017. *Stepping stones to Paris and beyond: Climate change, progress, and predictability* (p. 4).
4. UK Committee on Climate Change. 2008. *Building a low-carbon economy – the UK's contribution to tackling climate change* (p. 114).
5. UK Committee on Climate Change. 2008. *Advice on the long-term (2050) target for reducing UK greenhouse gas emissions* (p. 4).
6. London School of Economics webpage, Grantham Research Institute, The Economics of Climate Change: The Stern Review. http://www.lse.ac.uk/GranthamInstitute/publication/the-economics-of-climate-change-the-stern-review/ [Accessed 9 February 2018]
7. Ministry for the Environment. 2016. *New Zealand's Action on Climate Change*.
8. OECD. 2017. *OECD Environmental Performance Reviews: New Zealand*. Paris: OECD Publishing.
9. Ministry for the Environment. 2017. *New Zealand's Seventh National Communication: Fulfilling reporting requirements under the United Nations Framework Convention on Climate Change and the Kyoto Protocol* (p. 19).
10. UNFCCC. 2015. Paris Agreement, Articles 4 and 6.2.
11. Ministry for the Environment. 2015. *Report upon expiration of the additional period for fulfilling commitments by New Zealand*.
12. Simmons, G. and Young, P. 2016. *Climate Cheats: How New Zealand is cheating on our climate change commitments, and what we can do to set it right.* The Morgan Foundation.
13. Department for Business, Energy and Industrial Strategy. 2017. *Final UK greenhouse gas emissions national statistics: 1990–2015*. https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-2015 [Accessed 18 February 2018]
14. World Bank Data: CO_2 emissions for the UK. *NB: This is for carbon dioxide only, not CO_2 eq. Source: Carbon Dioxide Information Analysis Center, Environmental Sciences Division, Oak Ridge National Laboratory, Tennessee, United States. https://data.worldbank.org/indicator/EN.ATM.CO2E.KT?locations=GB [Accessed 18 February 2018]
15. UK Committee on Climate Change. 2010. *Meeting Carbon Budgets – ensuring a low-carbon recovery, 2nd Progress Report to Parliament* (p. 9); Bowen, A. and Rydge, J. 2011. *Climate change policy in the United Kingdom*. Centre for Climate Change Economics and Policy, Grantham Research Institute
16. Lockwood, M. 2013. The political sustainability of climate policy: The case of the UK Climate Change Act. *Global Environmental Change* 23: 1339–1348 (at p. 1346).
17. Ministry for the Environment. 2017. *New Zealand Greenhouse Gas Emissions Inventory 1990–2015* (p. xxiv).
18. Ministry for the Environment. 2017. *New Zealand's Seventh National Communication: Fulfilling reporting requirements under the United Nations Framework Convention on Climate Change and the Kyoto Protocol* (pp. 39, 54).
19. UNFCCC. 2017. *Aggregate effect of the intended nationally determined contributions: an update.*
20. Department for Business, Energy & Industrial Strategy. 2017. *2015 UK Greenhouse Gas Emissions.*

21. Ministry for the Environment. 2017. *New Zealand's Greenhouse Gas Inventory 1990–2015* (p. xxvii).
22. Ministry for the Environment. 2017. *New Zealand's Greenhouse Gas Inventory 1990–2015* (p. xxvii).
23. Ministry for the Environment. 2017. *New Zealand's Greenhouse Gas Inventory 1990–2015* (p. xxv).
24. UK Climate Change Act 2008, s 2. Alternatively, the 2050 target can be amended in connection with (1) an order to include additional greenhouse gases in the Act, or (2) new regulations to include international aviation and shipping (IAS) emissions.
25. UK Climate Change Act 2008, s 3.
26. The process of gazetting targets under the Climate Change Response Act 2002 does not make them legally binding.
27. There will be some minor changes in interpretation of a percentage emissions reduction target depending on international accounting rules.
28. Macrory, R.B. 2012. The UK Climate Change Act – Towards a Brave New Legal World? In: *Regulation, enforcement and governance in environmental law* (2nd ed.). Oxford: Hart Publishing: 261–274.
29. United Nations. 2015. Paris Agreement, Article 4.
30. Ministry for the Environment. 2017. *New Zealand's Greenhouse Gas Inventory 1990–2015* (p. xxv).
31. UK Climate Change Act, s 1.
32. With the exception of Nicaragua and Syria. However, both countries have since signed the Paris Agreement, while the United States has subsequently indicated it will withdraw.
33. United Nations. 2015. Paris Agreement, Article 2.
34. United Nations. 2015. Paris Agreement, Article 3.
35. United Nations. 2015. Paris Agreement, Article 4.
36. Including criteria for eligibility to hold office, and fixed processes for the removal of board members.
37. In the UK, there are also processes in place in which the relevant select committee can decide to hold a pre-appointment hearing on key public appointments and report their view on the suitability of a candidate. Lord Deben was subject to such a pre-appointment hearing. The decision on appointment of a particular candidate still sits with the Secretary of State, who must consider the select committee's view, but need not take it. If the Secretary of State does not accept the recommendation of the select committee, he or she must explain why. (UK Energy and Climate Change Committee. 2012. *Fourth Report: Pre-appointment hearing with the Government's preferred candidate for Chair of the Committee on Climate Change)*.
38. New Zealand Superannuation and Retirement Income Act 2001, ss 55–56.
39. Energy Efficiency and Conservation Act 2001, s 25.
40. Pers. comm., Mike Thompson, Head of Carbon Budgets, UK Committee on Climate Change.
41. Her Majesty's Government. 2010. *Committee on Climate Change Framework Document* (p. 14, para. 13.1).
42. Joint Committee on the Draft Climate Change Bill. 2007. *Draft Climate Change Bill – Volume I: Report together with formal minutes*. House of Commons and House of Lords, p. 51, para. 154.
43. Joint Committee on the Draft Climate Change Bill. 2007. *Draft Climate Change Bill – Volume I: Report together with formal minutes*. House of Commons and House of Lords, p. 51, para. 153.

44. Joint Committee on the Draft Climate Change Bill. 2007. *Draft Climate Change Bill – Volume I: Report together with formal minutes*. House of Commons and House of Lords, p. 51, para. 154.
45. Lord Rooker, Minister, Hansard HL, 14 January 2008, Vol. 697, col. 1070.
46. Carbon Budget Orders can be found at: https://www.gov.uk/guidance/carbon-budgets
47. House of Commons Information Office. 2008. *Factsheet L7 Legislative Series: Statutory Instruments*.
48. This reflects the allowance in the UK Climate Change Act for the purchase of international carbon credits to contribute to meeting carbon budgets. The responsible Secretary of State must set a limit on the use of these credits 18 months in advance of the relevant carbon budget (s 11).
49. UK Climate Change Act, s 34.
50. UK Climate Change Act, s 35. The UK's 2050 target and carbon budgets currently exclude emissions from international aviation and international shipping, but the Act states that in setting carbon budgets, the Government must take these emissions into account. The Committee has advised that the UK should plan for international aviation and shipping emissions of around 41 $MtCO_2e$ in 2050 – this has been incorporated into the Government's scenarios.
51. Lord Rooker, Minister, Hansard HL, January 2008, Vol 697, col 1071.
52. This occurred when the Government decided to pursue nuclear generation options that were more expensive than on-shore wind and large solar photovoltaic facilities. Pers. comm., David Joffe, February 2018.
53. Client Earth. 2009. *The UK Climate Change Act 2008 – Lessons for National Climate Laws* (p. 30).
54. UK Climate Change Act, s 14.
55. This sentiment was reported at stakeholder workshops held by the Committee on Climate Change for the fifth budget, e.g. UK Committee on Climate Change. 2015. *The Fifth Carbon Budget: The next step towards a low-carbon economy* (p. 24).
56. Client Earth. 2016. *Mind the Gap: Reviving the Climate Change Act* (p. 28).
57. UK Committee on Climate Change. 2017. *Meeting Carbon Budgets: Closing the policy gap* (p. 8).
58. UK Committee on Climate Change. 2018. *An independent assessment of the UK's Clean Growth Strategy: From ambition to action* (p. 9).
59. See, for example, Church, J. 2015. Enforcing the climate change act. *UCL Journal of Law and Jurisprudence* 4: 109–134; and Macrory, R.B. 2012. The UK Climate Change Act – Towards a Brave New Legal World? In: *Regulation, enforcement and governance in environmental law* (2nd ed.). Oxford: Hart Publishing: 261–274.
60. Carter, N. 2014. The politics of climate change in the UK. *WIREs Clim Change* 5: 423–433.
61. Vaughan, A. 23 July 2015. Government kills off flagship green deal for home insulation. *The Guardian*.
62. Department of Energy and Climate Change Press Release, 25 November 2015, Her Majesty's Government Statement to Markets Regarding Carbon Capture and Storage Competition.
63. Confidence and Supply Agreement between the New Zealand Labour Party and the Green Party of Aotearoa New Zealand. https://www.greens.org.nz/sites/default/files/NZLP%20%26%20GP%20C%26S%20Agreement%20FINAL.PDF [Accessed 18 February 2018]
64. The Royal Society of New Zealand. 2016. *Climate change implications for New Zealand*; Ministry for the Environment. 2016. *Climate Change Projections for New Zealand: Atmospheric projections based on simulations undertaken for the IPCC 5th Assessment*.

65. Mullan, M. et al. 2013. *National Adaptation Planning: Lessons from OECD Countries*. OECD Environment Working Papers, No. 54, OECD Publishing.

66. Article 7.9 of the Paris Agreement states *"Each Party shall, as appropriate, engage in adaptation planning processes and the implementation of actions, including the development or enhancement of relevant plans, policies and/or contributions, which may include: (a) The implementation of adaptation actions, undertakings and/or efforts; (b) The process to formulate and implement national adaptation plans; (c) The assessment of climate change impacts and vulnerability, with a view to formulating nationally determined prioritized actions, taking into account vulnerable people, places and ecosystems; (d) Monitoring and evaluating and learning from adaptation plans, policies, programmes and actions; (e) Building the resilience of socioeconomic and ecological systems, including through economic diversification and sustainable management of natural resources."*

67. OECD. 2015. *Climate Change Risks and Adaptation: Linking Policy and Economics*; OECD. 2015. *Adapting to the impacts of climate change: Policy Perspectives;* OECD. 2015*. National Climate Change Adaptation: Emerging Practices in Monitoring and Evaluation*.

68. Assessing progress on adaptation is not in itself without challenges. It is difficult to measure the impact that a policy or intervention has on exposure or vulnerability, and often the data needed to make such assessments is either imperfect or limited. Nevertheless, monitoring progress is considered to be an important element of effective adaptation. (OECD. 2015. *National Climate Change Adaptation: Emerging Practices in Monitoring and Evaluation*; EY. 2015. *An assessment of the transferability of the UK's approach to monitoring and evaluating climate adaptation progress to the Canadian context*. Prepared in collaboration with the Adaptation Platform's Measuring Progress Working Group, with the support of Natural Resources Canada.)

69. Mullan, M. et al. 2013. *National Adaptation Planning: Lessons from OECD Countries*. OECD Environment Working Papers, No. 54.

70. Jude, S.R. et al. 2017. Delivering organisational adaptation through legislative mechanisms: Evidence from the Adaptation Reporting Power (Climate Change Act). *Science of the Total Environment* 574: 858–871.

71. Her Majesty's Treasury. 2011. *The Green Book: Appraisal and Evaluation in Central Government* (pp. 5, 64).

72. UK Committee on Climate Change. 2017. *Progress in preparing for climate change: 2017 Report to Parliament* (pp. 217–218); Porter, J.J. et al. 2015. The right stuff? Informing adaptation to climate change in British Local Government. *Global Environmental Change* 35: 411–422.

73. UK Climate Change Act 2008, ss 56–57. In practice, the Adaptation Subcommittee carries out the risk assessment and identifies priority areas, and this is accepted by the Government. The Adaptation Subcommittee's latest advice in 2016 consisted of not only the Subcommittee's summary, but also eight technical chapters written and developed largely by academics, consultants, experts from industry bodies and non-governmental organisations, and some government departments, alongside members of the Climate Committee's secretariat. (UK Committee on Climate Change, UK Climate Change Risk Assessment 2017 Evidence Report, Technical chapters https://www.theccc.org.uk/tackling-climate-change/preparing-for-climate-change/uk-climate-change-risk-assessment-2017/ccra-chapters/ [Accessed 20 December 2017])

74. UK Climate Change Act 2008, s 58.

75. UK Climate Change Act 2008, s 59.

76. UK Climate Change Act 2008, ss 61–69.

77. OECD. 2015. *Climate Change Risks and Adaptation: Linking Policy and Economics*; OECD. 2015. *Adapting to the impacts of climate change: Policy perspectives*.

78. Climate Change Adaptation Technical Working Group. 2017. *Adapting to Climate Change in New Zealand – Stocktake Report*.

79. IPCC Working Group II. 2014. *Impacts, Adaptation, and Vulnerability* (Chapter 15: Adaptation planning and implementation); Mullan, M. et al. 2013. *National Adaptation Planning: Lessons from OECD Countries*. OECD Environment Working Papers, No. 54, OECD Publishing; European Environment Agency. 2017. *Climate change adaptation and disaster risk reduction in Europe: Enhancing coherence of the knowledge base, policies and practices*.

80. Vallejo, L. 2017. *Insights from national adaptation monitoring and evaluation systems*. OECD Climate Change Expert Group Paper No. 2017(3), pp. 12–14.