SUBMISSION

To:                Environment Select Committee

Re:             Climate Change Response (Zero Carbon) Amendment Bill

1. This is a personal submission, which requests the Committee to report back to the House that this Bill ought to proceed with a number of important amendments.

2. I am a lawyer practising in the Bay of Islands. However, I have an extensive background in all aspects of the energy sector and have therefore taken a close interest in the science and economics of climate change for many years. A copy of my relevant CV and contact details are attached as an annexe to this submission¹.

3. The attached submission comprises 12 chapters, each of which has been prepared in the form of an essay relating to an aspect of the Bill. The requested policy responses are summarised in the Synopsis that precedes the chapters.

4. I have not had the time to draft proposals for clause-by-clause amendments. With the indulgence of the Chair, I will put an ancillary paper forward before the Committee’s hearings commence.

5. I would welcome the opportunity to speak to my submissions in person, before the Committee.

Barry Brill

16 July 2019

¹ I have no objection to them being made public.
# TABLE OF CONTENTS

1. SYNOPSIS OF SUBMISSIONS

2. TARGET : 2050
   2.1 *The Zero Carbon Bill*
   2.2 *We Are The Climate Champions!*
   2.3 *2050 – Costs And Benefits*
   2.4 *Targets Or Virtue Signals?*

3. TARGET : METHANE
   3.1 *The Short-Lived Gas*

4. TARGET : 0.63°C PEAK
   4.1 *1.5°C – The Cuckoo in The Nest*

5. CLIMATE COMMISSION
   5.1 *What Is A Climate Commission?*
   5.2 *The United Kingdom Precedent*
   5.3 *Two Stones For Every Bird*

6. BUDGETS/PLANS
   6.1 *Writing Budgets/Plans*
   6.2 *A Bang For Every Buck*
   6.4 *The Climate Scare Could Be Gone by 2030*

7. ADAPTATION
   7.1 *Resilience And Adaptation*

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**SYNOPSIS OF SUBMISSIONS**
1. GENERAL

(i) In drafting this far-reaching law, the Select Committee must throughout be conscious of two fundamental facts –

a) that New Zealand’s efforts to reduce its trivial greenhouse gas emissions can only ever be symbolic, and cannot have any discernible physical impact on the future global average temperature.

b) that the worldwide effort to mitigate climate change relies upon reducing aggregate global emissions, and geographical locations are barely relevant.

(iii) It is a fundamental convention of the New Zealand constitution that Parliament is sovereign and that no Parliament can bind the hands of future Parliaments.

(iv) The sensible and near-universal practice of discounting future costs and benefits to reflect the time-value of money, makes unworkable any evidence-based policy with a horizon exceeding about 15 years.

(v) The mandatory Regulatory Impact Statement (RIS) accompanying this Bill is unable to quantify any tangible benefits but indicates through modelling work that the economic costs are expected to be both prodigious and highly regressive. All this flows from the target dates.

(vi) The RIS is unable to assess the risks posed by the Bill but they will include “undue economic burdens” and “disproportionate costs” – except in the highly unlikely event that the rest of the world follows by adopting the same targets.

(vii) In any democracy, overall sustainable climate action is limited by the appetite of the voting public to endure economic pain as a trade-off for pressing the pace of emission reductions ahead of technology changes. Mitigation ‘ambition’ should always be linked to technology.

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2 In practice, this means our major trading partners – China, Australia, USA, Japan, South Korea, EU.
(viii) When a ‘cap and trade’ system exists, such as the New Zealand ETS, periodic lowering of the “cap” determines the maximum volume of emissions during the period concerned. All other policies combined cannot vary that volume, but can merely impact the cost of delivering the cap – and may move around the pain of adjustment as between sectors or groups.

2. TARGET: 2050

(ix) Climate science does not support a 2050 decarbonisation target. The IPCC (AR5) said that by 2050 global emissions would need to be between -35% and -55% compared with 1990 levels. New Zealand’s current Gazetted reduction target of -50% is already very ‘ambitious’.

(x) A long-distance target date adds nothing to investment certainty or to medium term budgetting unless it is accompanied by a pre-determined trajectory – which would defeat the whole purpose of evidence-based and realistic Budgets/Plans.

(xi) All references to target dates should therefore be removed from the Bill.

(xii) Alternatively, the zero carbon target should mirror Article 4.1 of the Paris Agreement - i.e. “To achieve a balance between anthropogenic emissions by sources and removals by sinks of New Zealand greenhouse gases in the second half of this century”.

(xiii) If the above Paris Agreement target is adopted, it could be further refined by including the recommendation of the Parliamentary Commissioner for the Environment that the proposed Commission be charged with recommending future long-term target dates (if any) for the elimination of the net impacts of each greenhouse gas.

(xiv) In the event that the Minister were to favour any target date or numerical target (whether or not based on the Commission’s recommendations) he already has the untrammelled power to set them in law at any time by regulations made under s 225 of the existing Act.
The content of the New Zealand NDC target from time to time should not be enshrined in law, either expressly or by implication. It should, however, be the major driver in writing emission Budgets/Plans.

Leadership (undefined) ought not to be seen as a purpose of the Bill nor a reason for enacting this legislation. The multilateral effort to reduce global aggregate emissions requires co-operation rather than competition.

In its report back, this Committee should:

a) eschew “world leadership” as a Government goal;

b) reaffirm the National Interest Analysis on the Paris Agreement;

c) reiterate the long-held resolve that New Zealand must “do its fair share”;

d) draw attention to New Zealand’s existing strong contribution to global goals.

Drafting of the Bill should be informed throughout by the objective of maintaining our net per capita emissions of long-term gases below the average of the 36 OECD countries. This guiding principle should be included as an additional matter in Clause 5Z(2)(b) of the Bill.

To avoid negative unplanned and climate-irrelevant impacts on immigration policy, the Bill and future Budgets/Plans should generally be expressed in per-capita rather than per-populace terms;

Global emission levels are largely driven by: population x gdp per capita x energy intensity x carbon intensity of energy (Kaya Identity). The proposed Commission should focus on the cost-benefit of steps within New Zealand to improve the last two components.

3. TARGET: METHANE

The New Zealand landmass comprises a net carbon sink, thanks to the absorption of CO2 by our forests and farmlands that far exceed all CO2 emissions from our cities and towns.

Atmospheric studies show that annual sequestration of some 45Tg of CO2-e (more than our total reported emissions) is not now being reflected in New Zealand’s National inventory Reports. This may well represent current under-reporting of the full sink effects of livestock-rearing pasture-lands.
New research has established that the volume of biogenic methane emitted by New Zealand’s cattle and sheep does not contribute significantly to global warming, and will not do unless and until livestock numbers increase.

According to the PCE and the Productivity Commission, livestock farming accounts for about one-sixth of New Zealand’s emissions, as opposed to the one-half contribution that has been publicly attributed to this sector in the past. New Zealand’s share of global emissions will likewise decrease from 0.16% to about 0.09%.

Any increases in the methane emitted by our livestock will have a warming impact of only 7-8 times CO2 and not the 28 times previously assumed.

The suspected indirect warming effects of atmospheric methane are speculative and unproven. Quantification of the direct and indirect infrared reradiation attributable to an added atmospheric methane molecule is such an unsettled and dynamic field of science as to be quite unsuited for long-term policy making. It should instead be the subject of a detailed inquiry held under the aegis of the proposed Commission.

It has been argued that New Zealand should not only contribute to the goal of “reaching global peaking of greenhouse gas emissions as soon as possible” but should contemporaneously “undertake rapid reductions” of the existing stock of greenhouse gases. That argument was considered and rejected by the UNFCCC at COP21, resulting in the word “thereafter” being included in the wording of Article 4 of the Paris Agreement.

In the context of production from livestock, account must be taken of the recital in the Paris Agreement (page 1) that it:

“Recognizes the fundamental priority of safeguarding food security and ending hunger”.

New Zealand’s livestock products are predominantly supplied to international commodity markets, and we are by far the least greenhouse gas-intensive supplier. Any increase in our market share will therefore produce a reduction in global emissions in accordance with the Paris Agreement.
objectives. This rationale has rightly prevailed in relation to other commodity products (aluminium, steel, methanol) and should be consistently applied.

(xx) The removal of local greenhouse gases by the permanent elimination or reduction of (say) a flock of sheep is fully comparable to removal by planting a forest and should be similarly incentivised under s 64(1) of the Act.

(xxi) The Act’s definitions of “forest land” and “forest species” should be expanded to maximise the opportunities for tree-planting by pastoral farmers.

(xxii) The inclusion of agricultural gases in the ETS cannot provide incentives to reduce methane-intensity (or N2O-intensity) unless the emissions from individual farms are regularly measured – which is not currently practicable. Further submissions cannot usefully be offered until the Government releases the relevant report of the Interim Climate Change Committee.

4. TARGET : 0.63°C PEAK

(xxiii) The primary purpose of the Act (s 3) is “to enable New Zealand to meet its international obligations under the UNFCCC Treaty and the Kyoto Protocol”. This is clearly outdated and should now be amended to include the Paris Agreement, which was ratified in full by the New Zealand Parliament in 2016. The Bill fails to do this but instead cherry-picks 2-3 lines of text out of the 25-page document. This requires amendment.

(xxiv) The sole “peaking” target mandated by the Paris Agreement is 2°C above pre-industrial levels – which equates to 1.13°C from 2015. That goal is challenging but achievable.

(xxv) The reference in Article 2 to 1.5°C – which equates to 0.63°C from 2015 – is a “best efforts” aspiration and is not an official target. It is neither practically achievable nor affordable.

(xxvi) None of the “end of the world” hype that has followed SR1.5 is remotely justified by the report itself, and much has been motivated by a political change-the-entire-economy agenda.
By doubling the Paris Agreement mitigation commitment from 1.13°C to 0.63°C, Parliament would be effectively trebling the sacrifices required of the New Zealand people. No political party has a mandate to do this.

5. CLIMATE COMMISSION

This Bill is Parliament’s sole opportunity to shape the character, role and methods of the proposed Commission. It should be the independent and authoritative data-gatherer, fact-finder, cost-assessor, and objective analyst for all key elements required for climate change mitigation and adaptation policy decisions. On scientific or technical matters, it should not be the source of advice but rather an independent conduit/filter/evaluator for the views of many experts, surveys, consultations, etc.

The adjective ‘expert’ should be omitted from Clause 5B.

The Commission should not act as a climate action lobbyist or watchdog. It should have an additional purpose (Clause 5B) that it will strive to synchronise rates of emissions reduction with the economy’s prevailing ability to absorb that rate without causing undue hardship, increases in poverty, or in the general standard of living.

All reasonable steps should be taken to ensure the Commission has bipartisan support. Clause 5F should provide that the Minister will consult with the Opposition on the membership of the Nominating Committee, and on proposed appointees to the Commission.

No Commission member should be appointed for their expertise or specialist knowledge in any field or subject. Their role will be to independently assess the inputs of experts and others. However, background experience in evaluating evidence, economic analysis, local body administration, etc would obviously be valuable.

Although the UK Climate Committee is the precedent for the proposed Commission, the latter must not follow in the footsteps of the former. The UK Committee is a product of the time and place of its creation, and current New Zealand circumstances are very different. In particular, the Commission should be at pains to avoid the UK Committee’s climate zealotry image.
(xxxiv) Clause 5Z of the Bill should include (a) fiscal circumstances; (b) energy policy; (c) sectoral competitiveness and (d) fuel poverty, as matters to be taken into account. All are contained in the UK Act.

(xxxv) Clause 5ZB(2) should be omitted from the Bill as being wrong in principle. The UK Act (s 22) allows the Minister to amend budgets after receiving public advice from the Committee.

(xxxvi) Select Committee members should familiarize themselves with Professor Dieter Hem’s official review of the compliance costs of the UK Act (and Committee work). The findings of the “Cost of Energy Review” are summarised on Professor Helm’s website.

(xxxvii) The most important point to be drawn from Professor Helm’s review is that a scattergun set of intersecting and complex policies is counter-productive and creates unnecessary cost. There should not be “two stones for one bird”.

(xxxviii) Clause 5ZL should be replaced by a direction that the “policies and strategies” in 5ZD–F are to be limited to variations in ETS settings except to the extent that the Minister directs otherwise.

(xxxix) Once Budgets are set, the major role of the Government is not to augment the work of the ETS “cap”, but to ameliorate and re-distribute its harsh and regressive consequences.

(xl) Professor Helm rightly warns against over-egging carbon budgets in the early years, as technology improvements are very likely to drive a steep BAU trajectory in future decades. I have also emphasised this point in “The Climate Scare Could Be Gone By 2030”.

(xli) The Commission should be empowered to delegate to sub-committees and to appoint external “hearings committees” to conduct consultations.

6. BUDGETS/PLANS
(xlii) The pain appetite/ambition levels for the first two budget periods have been largely pre-empted by the NDC. The detail of these budgets will need to make transparent how this commitment is to be met. Budgets during the 2030s are likely to be similarly driven by a future NDC.

(xliii) An overriding factor in all Budget writing will be to ensure that New Zealand is “doing its fair share”, and the Commission will need to maintain and analyse an objective record of what is being done by other OECD countries and by the major emitters. I have submitted above that our aim should be to keep New Zealand per-capita emissions below the average of OECD countries at all times.

(xliv) Clause 5Z(2)(b) should require the Commission to estimate the cost-per-tonne incurred by the use of each of the opportunities identified pursuant to Clause 5W(2)(c).

(xlv) The Commission should also identify the most cost-effective emission-reducing option available from time to time (whether or not this involves purchase of offshore mitigation). The latter figure will then provide a benchmark or yardstick for all other proposals, whether in the public or private sector. These will greatly assist the Cabinet in deciding whether to adopt the recommendations.

(xlvi) Clause 5W1 should be omitted from the Bill, while retaining Clause 5X(1)(e), (consequentially amended). A “YIMBY” attitude should not be encouraged in legislation. If opportunity arises to reduce more GHG tonnage or to lower economic costs, the Commission should exclude this low-hanging fruit only when there is a good and articulated reason to do so. If the reason is political, it is for the Minister to accept accountability for it by amending the recommended Budget.

(xlvii) Clause 5Z(2)(b) overstates the role of science and the word “relevant” should be substituted for “a broad range of domestic and international”. The current position of all New Zealand’s major political Parties is that “the science is settled and we are now moving on to the question of what should

3 Despite a strong YIMBY recommendation from the Climate Committee, the UK Cabinet has this month decided to retain full access to offshore mitigation in pursuing its targets.
be done about it”. It is surely not intended to allow climate sceptics to re-
litigate IPCC AR6 findings (due in 2022) before the Commission?

(xlviii) An exception to the previous paragraph is the science related to the
warming effects of agricultural gases. As New Zealand takes much more
interest in this topic than most developed countries, and is also a centre of
excellence in this field, it is submitted that a quasi-judicial panel (not
Commission members) should be appointed under the aegis of the
Commission to conduct a public enquiry.

(xlix) If the ETS ‘cap’ is to be effective, it is essential that the Commission acquire
a close understanding of the price-elasticity of motor spirits actually
experienced in New Zealand – including extent, timing and regressive
impacts. To this end (and for similar key issues) the Commission should be
given the power to commission original research projects.

(i) In preparing Budgets, any ‘carbon leakage’ to other countries should not be
considered to be an emissions reduction.

7. ADAPTATION

(ii) Improving the resilience of areas known to be vulnerable to weather
extremes is a least-regrets policy which will have positive value whether or
not current climate-related fears are realised.

(iii) While a degree of adaptation planning may be useful, communities should
not be expected to alter their current well-adapted behaviors until such time
as alterations are justified by actual observed changes in temperatures and
weather patterns.

(i) To the extent that anything other than building resilience is intended to be
incorporated under “adaptation”, the term should be defined in the
legislation. It is used very imprecisely in Article 7 of the Paris Agreement,
presumably because of diplomatic niceties involving the rights of developing
country Parties.

(ii) The IPCC has emphasised that long-term prediction of future chaotic climate
states is impossible. But Global Climate Models (GCMs) can project forward
their assessment of the past temperature ‘sensitivity’ of GHG concentrations for various future concentration scenarios. While outcomes are highly uncertain, averages can indicate direction and approximate magnitudes.

(iii) IPCC official projections are based on four widely-disparate hypothetical “pathways” – which are mutually inconsistent, and cannot be aggregated or averaged. Individual governments must decide for themselves which one of the four emission scenarios they consider to be most useful. This should be a priority task for the proposed Commission.

(iii) While I believe RCP 2.6 is by far the most likely trajectory (and look forward to offering submissions to the proposed Commission in that regard), future uncertainty is virtually unlimited in either direction.

(iv) The stated belief of some Local Authorities that they should use “worse case” rather than “risk-adjusted” scenarios for planning purposes is bad risk management and inexcusably extravagant.

(iv) The first National Climate Change Risk Assessment should use a planning horizon of 20 years, except in relation to the six year horizon required for “the most significant risks”;

(iv) The first NCCRA should be published by the proposed Commission within three years of the enactment of the Bill, the second three years later and thereafter at six-year intervals. Sensibly, the Bill ascribes no significant statutory role to any politician in the preparation of these Assessments.

(iv) The Minister should not prepare a 2020 NCCRA, and Clause 5ZP should be excised from the Bill.

(iv) Clause 5ZQ(2) should be redrafted to ensure each Adaptation Plan will be limited to the Government’s responses to the issues raise by its corresponding NCCRA. Subclauses (3) and (5) should be omitted.

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4 Provided all assumptions are correct. An important assumption is that the impact of non-greenhouse factors such as natural climate variability will balance out to zero in ‘the long term’.
(ix) Part 1C should contain a provision akin to Clause 5ZE (which relates to Emission Reduction Plans) whereby the Commission has a role as adviser to the Minister in the preparation of Adaptation Plans.

(ix) Clause 5J should be amended to include adaptation planning in the Commission's functions.

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The Zero Carbon Bill

There are many good reasons why the Climate Change Response (Zero Carbon) Amendment Bill 2019 ought to have been denied a first reading:

- it carefully disguises the fact that eliminating all of New Zealand’s trivial emissions will make no detectable difference to future world temperatures – reducing the global total by our current 0.1% can never be any more than a symbolic gesture;

- its three declared “over-arching purposes” (the “guiding principles agreed by the cabinet”) have nothing to do with influencing future global average temperatures. They are:
  a) “leadership at home and abroad”;  
  b) “a just and inclusive society”;  
  c) “a productive and climate-resilient economy”;

- it is all pain, and no gain. Its Regulatory Impact Statement (RIS) (which is rife with risk and guesswork) is unable to identify any quantifiable benefits at all, while finding that the costs will be horrendous - i.e. the Bill will cause “the economy to grow at a slower rate than expected by $5-12 billion a year over 2020-2050”;

- it ensures increases in child poverty and general energy poverty by mandating unlimited increases in the prices of electricity, petrol, diesel, and gas. The RIS expects “uneven distributional impacts on lower-income households and regions/communities” with the estimated weekly average cost being up to three times higher for the poorest 20% than for the wealthiest quintile;

- its huge risks strain credulity. The RIS acknowledges these cannot even be assessed at this time, but will include “undue economic burdens” if either (a) the rest of the world fails to follow New Zealand’s lead or (b) the Bill fails to stimulate large assumed (but imaginary) productivity gains, innovations, and technological developments;

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5 Economy-wide emissions are modelled at $75–885 per tonne of carbon dioxide equivalent (/tCO2-e) by 2050. Only $100-250/tCO2-e by 2050 would be required to deliver the Paris Agreement targets.

6 “The benefits of stronger climate change action … were not able to be included in the economic modelling. However, the Ministry …suggests the benefits of the proposal may be significant and contribute to the New Zealand Government’s wider economic, social and environmental policy objectives.”

7 Highly sensitive to assumptions that transformational innovation, technological developments and productivity gains will result from the Bill; and that forestry sequestration will always average 19-23Mt per year.

8 The antithesis of the Labour Party’s (limited) mandate

9 The projected cost of $12 billion per annum equals $8,000 per average New Zealand household every year, or an average of $160 per week per household for the next 30 years

10 An outcome the Treasury considers unlikely: “Little evidence or argument is available to support that assumption….This creates significant uncertainty as to the benefits of the proposed action…”
• it is fundamentally **anti-democratic** in seeking to bind future Parliaments and governments by a heavily entrenched 30-year target and 15-year budgets/plans;

• it is **unconstitutional** in delegating to the Minister for Climate Change the power to impose the largest tax increases in history. Prior to the next election\textsuperscript{11} the Minister is to unilaterally declare legally-binding emission caps (that translate into ETS taxes) for the following **15 years**;

• it arms Minister Shaw with unfettered statutory **authority** to decide what climate-related risks might arise in any part of the country and what should be done about any of them. His 2020 plan can render homes uninsurable, devastate property values and hike rating burdens - without limitation - and will override all the existing protections in the RMA and elsewhere;

• it envisages government intervention and regulation in every aspect of daily life, so as to facilitate a centrally-planned **‘transformation’** of New Zealand’s economy, society and environment\textsuperscript{12};

• it divides town and country, imposing blatantly discriminatory and unattainable planetary **cooling**\textsuperscript{13} obligations on New Zealand’s livestock farming sector – contrary to recent science and to expert advice;

In short, this Bill is not only the most expensive (by orders of magnitude) but might also be the most dangerous piece of government legislation **ever** placed before New Zealand’s House of Representatives.

**The Capping Mechanism**

Before the next election, Minister Shaw will announce the maximum volume of each greenhouse gas that can be lawfully emitted in each year during 2020-2036, along with the government’s plans for enforcing these caps. A new Climate Commission, appointed by the Minister, will identify the **level of energy taxes** (or livestock tax) required in each year to prevent those caps being exceeded, and will then implement those levels by changing ETS settings.

Once the Minister’s caps are declared, the **delivery process** is on automatic pilot. Energy prices will simply rise to whatever level it takes to become unaffordable for enough people. Petrol will go up by previously unimagined leaps and bounds until a great many New Zealanders can no longer

\textsuperscript{11} The RIS (p4) discloses that - “Transitional provisions will apply to the setting of the first three emissions budgets to ensure these are in place by no later than 31 December 2020”, and this could not conceivably be undertaken by a newly elected Minister. Amendments by the incoming Minister are prohibited (except in very limited circumstances).

\textsuperscript{12} All Ministers are empowered to give “Guidance” to their departments. The Commission is to have expertise in “the ecological, social, economic and distributional effects of policy interventions” – as well as Maori traditional knowledge, language, custom, protocol, etc.

\textsuperscript{13} Other sectors are merely required to gradually reduce **warming** activities – and have the benefit of government-funded forestry offsets.
drive their cars. Low-income and fixed-income drivers will obviously be the first to drop out, and then it will be the turn of average wage-earners\textsuperscript{14}. Rural dwellers will be the hardest hit.

Nobody knows how high the per-litre price might need to go – it is all a leap in the dark. Personal or family hardship is \textbf{not} a relevant factor and nor is economic damage. But there is no turning back, because the declared caps are legally binding and so entrenched that neither James Shaw nor his successors can change them (except in very narrow circumstances).

Ambitious caps will cause havoc. High diesel prices have been rightly called “a tax on everything” that will make the cost-of-living rocket. Petrol prices will stop people from working. Many more households, including those with small children, will have their power cut off – and the winter death toll will inevitably rise. Gas-reliant industries will become uneconomic.

But the Minister must also “\textit{recognise and mitigate the impacts on iwi and Māori of reducing emissions}”. This seems to create a legally-binding obligation to ensure that Maori can continue to meet their energy needs, whatever happens to prices. Will this be done by exemptions or wealth transfers? Will the mitigation of impacts be voluntarily extended to Pacifica? To the poor? No doubt, this is where the murky “economic transformation” will enter the picture.

**The “Over-arching Purposes”**

Although the explanatory notes for the Bill contain much rhetoric about controlling future climate, this is unachievable as New Zealand’s efforts are merely \textit{symbolic}. Ergo, this cannot be a stated purpose of the Bill.

Commentators have long speculated that the UN’s climate mission may be primarily motivated by neo-marxist ideology and wealth distribution, rather than by genuine concerns about possible future weather. This radical Bill tends to confirm that speculation.

1. **Leadership at home and abroad**

If enacted, the Bill will certainly crown Ms Ardern and Mr Shaw as the undisputed world leaders of the long-sought climate revolution. They will be feted and applauded at UN-sponsored conferences in every corner of the globe.

The UN director-general has already praised this country’s “\textit{extraordinary leadership}”, noting that New Zealand will be “in the front lines”, at a time when the rest of the world is “not on track to achieve the objectives defined in the Paris Agreement, and political will seems to be fading”\textsuperscript{15}.

New Zealand will be so far in front as to be the world’s \textbf{only} country to –

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14 Although the wealthy won’t like the pricing, they won’t ever be forced off the road. Nor will MPs.

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15 This refers to the EU’s recent refusal to accept a “Zero by 2050” target, the USA pull-out from the Paris Agreement, and recent increases in coal-powered generation in China and India.
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\textsuperscript{14} This refers to the EU’s recent refusal to accept a “Zero by 2050” target, the USA pull-out from the Paris Agreement, and recent increases in coal-powered generation in China and India.
i) become legally bound to the UN aspiration\textsuperscript{16} to limit post-1850 global warming to 1.5°C (i.e. about half-a-degree\textsuperscript{17} over the next few hundred years);

ii) volunteer massive poverty-inducing economic sacrifice for at least two generations;

iii) impose uncapped and automated energy taxes that are essentially non-repealable\textsuperscript{18}, initially from 2020 to 2036;

iv) drive down production capacity and export earnings in our most important industries.

For the past 20 years, all Governments have agreed that NZ ought to do its \textit{fair share}\textsuperscript{19} in reducing global emissions – for reputational reasons and to demonstrate that we are good global citizens. This Bill rejects that longstanding bi-partisan policy and substitutes the ambition of \textbf{world leadership}.

There are two dictionary meanings of “\textit{lead}”: (a) a successful example that others will follow; and (b) be in first place in a contest. This Bill only achieves the latter meaning: it has a self-centred, pious, brassy tone which will \textbf{not} endear New Zealand to other governments – despite the mandatory admiration they might well utter in public.

The major emitters (China, USA, India, EU, Russia) are, understandably, interested in the most cost-effective and least-masochistic policies for reducing global emissions. But the Bill takes the opposite tack – disallowing high-return CO\textsubscript{2}-reduction investments within poorer countries and encouraging both carbon leakage and “emissions outsourcing” that improve New Zealand's figures at the expense of \textbf{damaging} the global effort\textsuperscript{20}. It seems to be all about New Zealand winning that gold medal.

\textbf{2. A Just and Inclusive Society}

Many will be surprised to learn that the Bill’s core purposes include social justice, racial fairness, gender equality, etc. In the Green Party lexicon, these social engineering ambitions are the real drivers of the world’s giant climate-justified experiment to replace a ‘failed capitalist system’.

Because all climate policy has negative prosperity effects, and is highly regressive, the extreme requirements of this Bill will greatly magnify both absolute poverty levels and wealth inequality. These first-round impacts will obviously be unacceptable to politicians of all stripes, and will

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\textsuperscript{16} As opposed to the formal Paris Agreement target of 2.0°C since 1850

\textsuperscript{17} Only half of the warming of the last 100 years – the most productive century in history

\textsuperscript{18} A ratchet enables them to be increased if global temperatures rise faster than expected, but they cannot be decreased if temperatures plateau or fall;

\textsuperscript{19} Our “fair share” is measured by reference to the average of our trading partners, or other OECD members

\textsuperscript{20} As has already been quantified with the Oil & Gas exploration ban. The Caygill Report (2011) clearly identified that NZ dairy production has lower emissions per kg than milk from any other country.
provide justification for endless re-distribution interventions\textsuperscript{21}. They also provide cover for other steps to overcome the perceived unfairness of our present free market system.

3. \textit{A climate-resilient economy}

This purpose presumably reflects Part 1C of the Bill which requires the Minister to prepare a 2020 national risk-assessment report and a national adaptation plan. The Plan will set out a timetable for the government’s proposals for adapting to all the anticipated risks of forecast climate changes, along with “any other matter that the Minister considers relevant” and “will need to go beyond what can be covered under the RMA”.

There are no requirements for Parliamentary approval or for the same rights of appeal as lie against Regional or District plans approved under the RMA. Draconian provisions are also included for obtaining confidential information from private organisations.

This over-arching purpose empowers the intended ‘transformation’ to a \textit{productive, sustainable, and climate-resilient economy} that is mentioned in so many of Minister Shaw’s speeches. The Minister imagines his central planning will bring about “future innovations, technological developments and productivity gains.”

\textbf{Politics of the Bill}

Any Act of Parliament which aspires to bind 10 successive Parliaments needs to be moderate and centrist and have something close to unanimous support. This Bill has none of those characteristics, and the Government did not even try to secure support from the country’s largest political party. After preliminaries, the Minister broke off all communication with the National Party throughout the two months prior to the Bill’s First Reading.

Although apologising to Todd Muller MP for his discourtesy, James Shaw acknowledged in Parliament that, in the end, the decision-making was monopolised by the Coalition parties, along with interest groups such as trade unions, environmental lobbies, and Maori. The government’s original ambition to achieve bi-partisan legislation was abandoned, but with regret. The new Coalition’s strategy is an over-the-top Bill which begins life as ‘Green Party Heaven’ but might yet be pegged back by a reluctant inch-by-inch process during the select committee hearings.

The blatant anti-rural prejudice of the methane provisions seems to be a “shiny object” designed to attract flak and draw attention away from the more nuanced dangers of the core Bill. It will be no surprise if NZ First turns up on its white charger in November to save the farmers at the 11th hour – once into that final 12-months of coalition when NZF must clearly differentiate itself.

Like Australia, where climate change has been “\textit{the third rail of politics}”, New Zealand’s next election seem likely to be dominated by issues raised by the Green Party’s ideology. The present Bill meets \textbf{none} of the five ‘must-haves’ spelled out by the National Party in 2018:

\begin{itemize}
  \item \textit{A long-term, low emissions development strategy will also be necessary to .. drive the transition, with support arrangements to avoid or ease uneven distributional impacts across regions and society.}
\end{itemize}
(i) **Science-based:** The Bill makes no reference at all to climate science and *precedes* the UN IPCC’s Sixth Assessment Report (AR6), now in draft and nearing completion. The RIS and Explanatory Notes both rely on relentless hyperbole rather than citing any extracts from either the UN’s published science consensus or NZ’s official weather data.

(ii) **Technology-driven:** Ideology has already driven the government’s rejection of new technology in genetically-engineered grasses and 21st-century modular nuclear reactors. Its 2019 budgetary focus will ape yesterday’s high-cost policies that have *notably failed* in the EU rather than seeking to be early adopters and innovators in any of tomorrow’s *fields that other countries might follow*.

(iii) **Long-term incentives:** The radical overarching purposes of the Bill ensures an end to the climate policy consensus of the last 20 years. Future uncertainty will abound until the Courts eventually rule on the Bill’s distasteful efforts to bind future Parliaments.

(iv) **Apace with trading partners:** The centre-left and centre-right of New Zealand politics are poles apart – will we pursue “leadership of the world” or revert to “doing our fair share”?

(v) **Minimal economic impact:** Concepts of cost-effectiveness, affordability, practicality, or environment/economic balance are all quite foreign to this Bill. As with the Oil & Gas exploration ban the Green wall-to-wall ideology allows for very few compromises.

While the Zero Carbon Bill purports to follow the UK Climate Change Act of 2008, which has been aptly described as “*history’s most expensive virtue signal*” (£300 billion in 10 years), this Bill is so much worse in a myriad of ways. In its economic damage alone, the government’s modelled cost estimate of NZ$75 billion ($5,000 per household) relies on wildly *optimistic assumptions* and has been *savagely* critiqued.

The “overarching purposes” should make New Zealanders very afraid. But even apart from those murky agendas, this Bill is simply unaffordable.
Climate-wise – We Are The Champions!

Climate policy lobbyists worldwide see the word “leader” as being the holy grail. It is used in a quantitative and competitive sense as in “country X is now in the lead” or “country Y is the clear leader”. Achieving leadership is positioned as a much-desired vanity project.

So who is the current gold medallist in the climate policy stakes?

New Zealand has fancied itself for some time. Back in 2008 then Prime Minister Helen Clark declared: “New Zealand is now a world leader in its action programme on climate change. Labour will keep it that way.” Here is Tom Scott’s 2008 cartoon “Green Utopia”:

Under John Key, we then went for the gold medal at Copenhagen in 2009. We did the same pre-Paris in 2015, with Simon Bridges as Minister. But the Green Party now claims we need to legislate for carbon neutrality by 2050 to be sure of clutching the prize.

Looking past the rhetoric, we find that there are endless innovative ways to measure success, and the Green lobby (eg Carbon Tracker) can and does devise an argument that every developed country is the world’s worst. However, if we focus instead on relevant metrics and hard data, there can be little doubt that we have already scorched off the competition from the other 35 developed (OECD) countries.

Top-down Measurement
New Zealand as a whole contributes a **negative** volume of carbon dioxide to the atmosphere. We are a net carbon sink. All those human-caused emissions from SUVs, tractors, coal power, cement, aircraft, NZ Steel, etc, etc – are all offset and absorbed by our forests and farmlands. If our whole country with all its 4.5 million people were to slip beneath the waves tomorrow, the world’s climate would be worse off!

NIWA scientists have carefully measured the atmospheric carbon dioxide on both sides of the country over a 36-month period, finding that New Zealand removes an average of **98 TgCO2 per year** from the global atmosphere. This is a net figure, after deducting the atmospheric result of its human-caused emissions which add only 35 TgCO2 per year. That is a big contribution to the rest of the world.

The peer-reviewed scientific paper, *Steinkamp et al (2017)*, notes that the bottom-up National Inventory Report (NIR) compiled by the Ministry for the Environment consistently under-estimates the sink value of our forestry and land use sectors as being 27 TgCo2 per year, when it is actually nearly five times higher.

Top-down estimates of the CO2 contributed by continental OECD countries is not possible, although it has been suggested that other afforested countries like USA and Canada, and farm-based countries such as Ireland might also be net carbon sinks. On the figures available though, the top-down count demonstrates that New Zealand is clearly the most climate-friendly country in the developed world!

**Net CO2 per capita Wikipedia** offers a list of the *gross* per-capita emissions of all 193 UN countries. As both the UNFCCC Treaty and the Paris Agreement place the primary mitigation obligation on developed countries, we need only compare ourselves to the other 35 members of the OECD. A comparison with our major trading partners shows:

<table>
<thead>
<tr>
<th>Metric Tonnes (Gross)</th>
</tr>
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<tbody>
<tr>
<td>Australia</td>
</tr>
<tr>
<td>Canada</td>
</tr>
<tr>
<td>Japan</td>
</tr>
<tr>
<td>New Zealand</td>
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<td>South Korea</td>
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<td>USA</td>
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<tr>
<td>EU (Average)</td>
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<tr>
<td>Non-EU OECD (Average)</td>
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<tr>
<td>OECD (average)</td>
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</table>

From the above it can be seen that New Zealand’s *gross* CO2 emissions per capita are *lower* than those of any of its major trading partners and below both the EU average and the OECD average. This is an impressive performance.

But the global effort to mitigate human-caused climate change is not about *gross* emissions. The Paris Agreement is unmistakably clear in seeking to “achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century”. Participants are required to focus on *net* emissions. Of the handful of developed countries which had lower 2014 per-capita gross emissions (Switzerland, Chile, Mexico, and Turkey), none of them have tree-planting projects to compare with New Zealand. It seems clear that, on a bottom-up count, we are the undisputed climate leader of the developed world!
Livestock Methane
For many years, the New Zealand media uncritically swallowed the Green activists’ spin that New Zealand had the “fourth highest per capita emissions” because of the enteric methane unavoidably produced by our ruminant livestock. This pervasive narrative has now been fully and finally exploded by the authoritative Oxford study, Allen et al (2018): “A solution to the misrepresentations of CO2-equivalent emissions of short-lived climate pollutants under ambitious mitigation”.

We now know that the translation of methane to CO2-equivalent was formerly exaggerated by a factor of at least four, so that the methane share of New Zealand’s annual greenhouse gas emissions reduces from 38% to about 9%. More importantly, the ‘cloud of methane’ decays as fast as it grows, so a steady state dairy herd (for example) adds no greenhouse warming at all.

The key solution is to minimise the herd’s methane outputs while maximising food production. The world climate champion would produce so efficiently that it has the world’s lowest emissions per kilogram of dairy products. That champion is New Zealand, whose dairy production is twice as climate-efficient as its nearest competitor (Ireland).

Renewables
Almost all developed countries have targets to convert a certain percentage of national electricity supplies to renewable sources by a certain date. This is an extremely expensive way to contribute to the global effort, as can be seen in Australia whose power prices have gone from amongst the lowest to be amongst the highest in the world over less than two decades. The UK has had a similar experience.

New Zealand luxuriates in having superb natural hydro and geothermal resources. Over 80% of our supply is renewable, a fact which places us at number 3 in the developed world (after only Iceland and Norway). Under this heading we are way ahead of all our trading partners.

Comparable Effort
A Ministry paper relating to our Paris Agreement Target suggested that inter-country comparisons might include (a) trade competitors; (b) countries in similar circumstances; or (c) some global average across all countries. As has been seen, I believe an average of OECD countries is more useful than a worldwide average.

The Treasury believes an “equal pain” indicator is most appropriate in gauging New Zealand’s “fair share” although acknowledging that it is difficult to measure and compare objectively. This is why I prefer the data-driven comparisons of per capita emissions.

MfE notes that the most cost-effective abatement available is often the purchase of international carbon offsets at the prevailing global carbon price. In my view, any government which chooses more expensive options is not entitled to any credit for the surplus pain it has volunteered to incur for its own selfish political reasons.

New Zealand’s efforts to mitigate climate change arguably out-do those of comparable countries:

- Our ETS covers more sectors and a wider range of long-lived gases that its European counterpart or any other national scheme. Its percentage of exempted industries is much lower. It is the only scheme that includes domestic aviation.
• The New Zealand ETS appears well constructed and has not experienced the series of scandals that have plagued the European scheme. It has not been sunk in fiery political controversy such as has obsessed Australia and is now occurring in Canada. Although our ETS is clearly available as a precedent, comparable countries have not yet chosen to follow it.

• Our taxes on petrol and diesel are amongst the highest in the OECD as is our current “carbon price booster” of NZUs at $25 per tonne.

• The UN director-general has praised this country’s “extraordinary leadership”, noting that New Zealand is “in the front lines”, at a time when the rest of the world is “not on track to achieve the objectives defined in the Paris Agreement, and political will seems to be fading”.

• IPCC climate scientists familiar with our efforts have been fulsome in their praise. Oxford Professor Myles Allen declared in a recent visit: “You are leading the world on climate change”.

• We have played a heavyweight role in climate change diplomacy, including proposing the non-legally-binding structure of the Paris Agreement and leading world efforts to phase-out fossil fuel subsidies. Similarly, we have led the international research effort in respect of agricultural gases.

“Ambition”
New Zealand accepted an ambitious (ie potentially painful) legally-binding target under the Kyoto Protocol and exceeded it. Canada withdrew, Japan reneged, USA ignored it and Australia joined very late.

Our Paris Agreement NDC for 2030 is well below BAU and will obviously be a huge stretch. Professor David Frame, New Zealand’s leading climate scientist, has observed:

“Our target is more stringent than, those of Australia (-26–28%), the United States (-26–28% by 2025), Canada (-30%) and Japan (-25.4%). Our target is roughly halfway between the European Union’s and Japan’s… If the rest of the world matched New Zealand’s climate change commitment out to 2050, then the world would be on course to meet its goal of warming by less than 2°C above pre-industrial levels.”

So, if we do not exceed the EU in ‘ambition’ are we leaders or losers? Professor Frame has done the numbers:

“Our 2005-2020 commitments have been roughly in line with what would have been expected of us if we had been a country within Europe, with the same per capita income we currently have.”

Professor Frame has also:

22 This refers to the EU’s recent refusal to accept a “Zero by 2050” target, the USA pull-out from the Paris Agreement, and recent increases in coal-powered generation in China and India.
“In AR5, which remains its most recent Assessment Report, the IPCC New Zealand’s 2050 target is -50% compared with 1990, which is .. toward the more stringent end.

Conclusion
Throughout most of this century New Zealand has been a ‘world leader’ in the effort to mitigate climate change. This raises interesting questions. What benefit has the country derived from this leadership? Has our lead been followed by others? Have we, directly or indirectly, effected any discernible reduction in the global average temperature predicted for 2100?
The fundamental question raised by the 2050 zero carbon proposal can be put simply: Is targeting such an early year worth the price? Or, is the proposed 2050 cure worse than the disease of waiting a little longer?

Governments and corporations everywhere answer similar questions all the time by cost-benefit analyses. But climate policy is an exception. No cost-benefit study of any kind is included in the 160-page Regulatory Impact Statement (RIS) that accompanies the ‘Zero Carbon Bill’.

We have a Government modelling estimate that the economic losses will amount to a massive $300 billion or about $20,000 per household. Is that a fair share for New Zealand?

Our current gross emissions are about 28 metric tonnes per household, so the modelled price might be slightly over $1,000 for each tonne reduced. Is that reasonable value for money? Why do no ETS themes reflect such a high cost? How can airlines and others “offset” a tonne of CO2 at a fraction of that price? Are more cost-effective methods available?

If the Paris Agreement targets a zero carbon period after 2050, why would New Zealand (a leading proponent of the Agreement) want to target an earlier period?

Exorbitant costs
As part of the RIS, the Government has published the results of modelling which it commissioned from NZIER to gain some order-of-magnitude feel for the economic impact of selecting 2050 as the target year.

The NZIER final report suggests a fall-off in productivity causing a GDP loss of between 10% and 22% by 2050 – a result described as “breathtaking” by former Reserve Bank chief economist Michael Reddell. “As one comparison, high end estimates of the GDP gains from preferential trade agreements (such as CPTPP or the proposed new one with the EU) tend to be about 1 per cent each”.

Reddell also says:
“We will give up – well, actually, take from New Zealanders – up to a quarter of what would have been their 2050 incomes, and in doing so we will know those losses will be concentrated disproportionately on people at the bottom …But it is hard to see what is in for New Zealanders – lagging badly behind other advanced countries on productivity anyway, with constant complaints about child (and other) poverty – to just happily sign in to such a huge economic sacrifice? And for what?”

But even these ballpark estimates are woefully understated. In a carefully considered paper “The price of feeling good”, Tailrisk Economics concludes that the Ministry’s consultation process was a sham, that the modelling was manipulated and deficient (hiding many negative economic impacts), and that the world is unlikely to follow us to a 2050 zero carbon target.

No NZ Climate Benefits
But the RIS says it is not possible to identify any quantifiable benefits at all. When we achieve net zero emissions, that is an improvement in the global position of only about 0.1%, which could have no discernible impact on the future global mean surface temperature (GMST).
The Ministry’s Consultation Document strongly implied that New Zealand regions would experience less future warming (and therefore avoid weather extremes) if the country could achieve the ‘Zero Carbon’ target. This implication was wholly unwarranted. Future average temperatures within New Zealand are not related in any way to this country’s own greenhouse gas emissions.

New Zealand’s efforts cannot deliver any discernible global benefits either. See the science discussion in the Annexe. On the contrary, Tailrisk Economics assesses that “climate change may have a small positive impact on New Zealand this century”.

**2050 not science-driven**
The selection of the year 2050 for decarbonisation is a purely political choice and could have no relationship to any estimation of its likely effects on future temperatures either at home or abroad. Rather, its stated driving force is “leadership at home and abroad”.

Both the Explanatory Note and the RIS recognize that no climate effects could arise from New Zealand choosing 2050 over any later date. This decision cannot impact on the physical world – only on the world of marketing and spin.

This is the only conclusion to be drawn from the official National Interest Analysis regarding the Paris Agreement which was approved by all Parliamentary parties in 2016, and relies upon international comity as the only reason for New Zealand to volunteer an emissions reduction. This formal document is undoubtedly correct in stating that we “cannot be seen to free-ride on climate change”.

But that is the only rational and legitimate ground for taking domestic climate action, and it does not point to a 2050 target.

The very same reasoning appears in the climate change policy in the Labour Party 2017 manifesto: “New Zealand must do its part, along with the rest of the world, in reducing climate pollution. It is not good enough to say we are too small to matter... Kiwis are not shirkers.”

Few would disagree that New Zealand’s aim must be doing its fair share – not re-interpreting the IPCC reports or the Paris Agreement and not leading the world.

In any event, setting distant targets is little more than bluster. As leading climate scientist David Frame says:

“The real issue for New Zealand is not the targets, but achieving the targets. It is not ambition we lack, but action. Current policy will not get us to the targets we have set. This is also the case in other developed countries. The answer is to work on the policy, not to fiddle with the targets.”

**Appetite for pain**
Professor Frame goes on to dismiss the climate activists who criticise the ‘inadequacy’ of every target and every policy in every country at all times:

“These assessments are a “view from nowhere” in the sense they are made by people who do not have to consider the trade-offs necessary for decarbonisation to take place. They do not need to worry about economic performance, social cohesion and the other things that actually form the main parts of what we expect from governments in liberal democracies.”
The fact is that every government intervention in the cause of climate change causes inefficiencies and distortions in our economic fabric which reduces our standards of living and our quality of life. Climate policy is all dark clouds and there is no silver lining. It is all pain and no gain for New Zealand, except to the narrow extent that we may be tangibly incentivising and supporting our trading partners in their efforts to reduce a potential planetary threat.

Activists use the euphemism “ambition” to describe the estimated upper limit to any country’s appetite for climate policy pain. Endless Pew surveys have established that most people are prepared to support climate action but only up to the point where the cost to their own households exceeds US$10 per month (call that about NZ$200 per year). The New Zealand ETS already exceeds that general worldwide pain threshold by about 4-5 times.

There is no reason to believe that middle New Zealand will be prepared to lead the world in climate masochism. Average kiwis did not participate in the Government’s misleading consultation process in 2018 and certainly did not know that (in the words of a former chief economist of the Reserve Bank):

“I would be surprised if ever before in history a democratic government has consulted on proposals to reduce the material wellbeing of its own people by up to 25 per cent.”

**Emission drivers**

Predictions of future temperature changes rely crucially on scenarios, and the IPCC has made considerable use of the *Kaya Identity* – which states that emission levels are largely driven by population x GDP per capita x energy intensity x carbon footprint of energy.

By the standards of the developed world, New Zealand’s population has rocketed over the past decade, and we are also said to have enjoyed a ‘rock star’ economy. It could be expected from those statistics that our energy-related emissions would have gone through the roof. But that has not happened because our energy intensity has been steadily improving – as a result of cumulative small changes in many relevant technologies. In fact, the country’s overall energy intensity (units of energy per unit of GDP) has been consistently declining for over 30 years.

We could achieve high targets, with relatively low pain levels (for current residents), by cutting off the net inflow of migrants and encouraging net outward migration. Or we could simply induce an endless economic recession by changing the Reserve Bank’s policy targets to include emissions reduction – if higher ‘ambition’ is required. Or perhaps reduce all speed limits to 20kph or ration domestic flying, or put an import ban on cellphones or cars, or adopt one of the “four cheaper ways to influence world opinion” put forward by economist Ian Harrison.

**Conclusion**

The onus of showing that 2050 is the best target year lies upon its proponents. So far, the evidence is totally lacking.

As senior Australian climate scientist Garth Paltridge has put it:

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23 A [2019 poll](https://www.bbc.com/news/science-46240216) has found that a majority would pay no more than $1 per month

24 As seems to be favored by the current Governor
“Whether we should do anything now to limit our impact on future climate boils down to an assessment of a relevant cost-benefit ratio. That is, we need to put a dollar number to the cost of doing something now, a dollar number to the benefit thus obtained by the future generations, and a number to a thing called “discount for the future” … It is extraordinary that horrifically large costs can even be contemplated when the numbers for both the future benefit and the discount for the future are little more than abstract guesses.”

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Annexe : Global Temperature Impacts

To begin assessing the global benefit from any climate policy it is necessary to identify the temperature consequences of two hypothetical cases – the first being a ‘Business as Usual’ (BAU) scenario, which provides the counterfactual to the second scenario in which emissions are reduced by the relevant policy. ‘Temperature’ means the GMST (measured in air just above all land and ocean surfaces).

There are endless opinions on scientific, economic and other complexities contributing to the recognition and attribution of human-driven GMST changes and/or the welfare impacts of such changes. However, for New Zealand legislative purposes, the only tenable approach is to simply adhere to the findings of the Assessment Reports of the UN Intergovernmental Panel on Climate Change (IPCC), the Fifth\(^{25}\) of which (AR5) was signed off on behalf of the New Zealand Government in Stockholm, Sweden, during September 2013.

AR5 offers a table of possible BAU temperature levels by 2050 and 2100 respectively, which range from beneficial to dangerous, but offer no probabilities. Users are left to make their own subjective\(^ {26}\) selections, on a “believed most likely” basis, of two key inputs:

- an equilibrium climate sensitivity (ECS)\(^ {27}\) within the range 1.5°-4.5°C
- a future emissions scenario (RCP) within the forcing range 2.6 –8.5

An important third imponderable is the likely future impact of natural internal variability\(^ {28}\) or natural forcing (eg volcanoes). Although WG1 is silent on this point, it does find\(^ {29}\) that “more than half of the observed warming” in the period 1951-2010 was human-caused – by a combination of greenhouse emissions and land use changes. That leaves the possibility that up to half the 0.65°C that was observed (ie about 0.3°C) could have been natural.

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\(^{25}\) Although Working Group 1 (WG1) of the Sixth Assessment Report is now in draft, it is not due to be published until April 2022.

\(^{26}\) IPCC/AR5/WG1 is unable to offer an opinion on either input, but notes that averaging is not an option. The range of possible 2050 and 2100 temperature outcomes is critically dependent on each.

\(^{27}\) The climate sensitivity metric required for application of the Table is known as the “Transient Climate Response” (TCR)

\(^{28}\) Such as the El Nino Southern Oscillation (ENSO), the Pacific Decadal Oscillation (PDO), the Atlantic Multi-decadal Oscillation (AMO), solar cycles, ocean thermocline changes, etc

\(^{29}\) This was an ‘expert judgment’. I discuss elsewhere the lack of relevant evidence. It is important to note that there is no consensus or even majority view between climate scientists on these 3 confounding issues.
Activists and the media generally choose a dramatic “worst case” approach – despite the fact that the estimated mathematical probability of that combination is much lower than the onset of either the next glaciation or a ‘little ice age’.

Then there is the complex question of quantifying the damage that could be avoided if the major future emitters – China, India, USA, EU, and Russia – were able to achieve ‘zero carbon’. That is even more complex. Recent Nobel prizewinner William Nordhaus says that “from the standpoint of economic rationality” it is optimal to keep warming the planet to about 3.5°C over preindustrial levels. Professor Richard Tol’s 2009 paper found that all published research found initial economic welfare from climate change and was “in sharp contrast to the urgency of the public debate and the proposed expenditure on greenhouse gas emission reduction”.

Despite the economists, the objective of the UNFCCC Paris Agreement is to restrain GMST from rising by more than 2°C above its calculated level of 14.10°C±1.00°C in about 1875. It has risen to 14.97°C over the last 140 years – an average of only 0.06°C/decade.

During the past half century, GMST has been rising at an average rate of about 0.13°C/decade – and, if this trend is projected forward, the 16.10°C limit would not be reached before 2100. But there is widespread concern that exponential growth in annual global emissions might accelerate this trend to cause the remaining “headroom” of about 1.13°C to be dissipated much earlier.

The Paris Agreement, relying upon voluntary reductions by 2030, could potentially reduce the ‘business as usual’ (BAU) GMST of 2100 by about 0.2°C in aggregate, as long as none of the reductions are achieved by ‘carbon leakage’. This rather modest contribution has been accepted, and indeed welcomed, by the international community.

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CO2 accumulates in the atmosphere over long periods. However, incremental atmospheric CO2 has an ever-diminishing warming impact on a logarithmic scale, as ‘saturation’ is approached.
Targets or Virtue Signals?

There seems to be a clear political consensus that New Zealand will, at some time in the future, achieve a balance between its anthropogenic emissions by sources and its removals by sinks of long-lived greenhouse gases. In the jargon, it will achieve ‘net zero carbon’ or ‘become decarbonised’.

When should this happen?

• The current (National-led government) policy leaves that question open and focuses instead on a reduction milestone. In April 2011, it issued a Gazette notice formalising a target to reduce greenhouse gas emissions below 50 percent of 1990 levels by 2050.

• A new Bill has been introduced (Labour-led government) which aims to select 1 January 2050 as the precise target date for net zero carbon and to entrench that specific date in the legislation. It also has precise target dates for short-lived gases.

• The Parliamentary Commissioner for the Environment (PCE) has issued a recent report recommending that Parliament ought not to fix any dates at this time but should instead: “Develop two separate targets for the second half of the century … based on the advice of the new Climate Commission.”

• The existing Climate Change Response Act 2002 says (s 4) that its primary purpose is to enable New Zealand to meet its international obligations under the UN Framework Convention on Climate Change (UNFCCC).

• Under the UNFCCC, the 2015 Paris Agreement expresses its purpose (Article 4(1)) as being to “achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century.”

• New Zealand has delivered to the UNFCCC its Nationally Determined Contribution as a commitment “to reduce greenhouse gas emissions to 30% below 2005 levels by 2030.”

No party political agreement

Climate change policy has become highly partisan throughout the developed world.

The Coalition Agreement between the NZ Labour Party and NZ First agrees that the coalition will “introduce a Zero Carbon Act and an independent Climate Commission, based on the recommendations of the Parliamentary Commissioner for the Environment.”

The Confidence and Supply Agreement between the NZ Labour party and the Green Party agrees to “introduce a Zero Carbon Act and establish an independent Climate Commission”. It also agrees to “adopt and make progress towards the goal of a Net Zero Emissions Economy by 2050”.

Neither agreement suggests that a 2050 target should be included in the Act. Both refer to ‘introduce’ and neither requires support at subsequent stages of the Bill. The NZ First agreement may have been intended to refer to the pre-2018 PCE recommendations, but certainly indicate a preference to adhere to the Commissioner’s recommendations.
The National and Act Parties have not had occasion to enter such agreements. The National Party has supported the establishment of the proposed Commission but have never indicated approval of a 2050 target date.

**Alternative targets**

As flexibility is clearly the best policy, I submit that references to specific quantities should be excised from the Bill. Section 225 of the Act already contains ample scope for targets of all kinds to be made by regulation.

As the Act's overall purpose is to enable New Zealand to meet its international obligations, the obvious target is as set out in the Paris Agreement:

> “To achieve a balance between anthropogenic emissions by sources and removals by sinks of New Zealand greenhouse gases in the second half of this century”.

Whatever target is used, it will be necessary to provide a definition of “New Zealand greenhouse gases” probably by reference to the National Inventory that we are required to report annually to the UNFCCC.

A further refinement would be the Environment Commissioner’s proposal that more specific targets be developed on a bottom-up basis by the new Commission. A well-reasoned realistic target is infinitely preferable to a top-down target that has been plucked out of the air.

(i) A less attractive possibility is that the target could relate to New Zealand’s NDC – ie 30% reduction of 2005 net levels by 2030. However, this promise already exists, and enshrining it in legislation merely converts a non-binding commitment into a statutory obligation.

This possibility should not be pursued. The strengthening of New Zealand’s commitment would be entirely gratuitous and not used as leverage to improve the status of the commitments made by other developed countries. The wording of the current NDC might also prove problematic as it is ambiguous as to the accounting of methane as either ‘gross’ or ‘net’ and the use of GWP*.

**Objective of National Targets**

When politicians draw bullseyes for future generations to achieve something by a far distant date the immediate reaction is widespread cynicism – for obvious reasons. While posing as proof of the commitment of current incumbents, such long-term targets are generally perceived as being substitutes for or distractions from near-term policy action.

Like toothless declarations of ‘climate emergency’, an over-the-horizon target can be readily dismissed as mere virtue-signalling. In this sense, target dates are counter-productive. So why should a rational and serious-minded Parliament enshrine one in statute law?

The Explanatory Note to the present Bill says that its first overarchings purpose” and “guiding principle” is to provide “leadership at home and abroad”. It further says that the intention of the 2050 target is “to signal an economy-wide transition”. I have previously criticised these aims in “The Zero Carbon Bill”.

**Leadership at home**

It is far from clear how selecting 1 January 2050 as the target could provide domestic leadership.
The term “leader” can mean one who is either (a) “out in front” or (b) “has followers”. As there will be only one long-term domestic target at home, the second cannot apply. However, there can be little doubt that selecting 2050 as the end-date is so far ‘out in front’ of our trading partners as to be characterised as “highly ambitious” or (to use the inverse expression of the same concept) “pain maximising” [see below].

If the Cabinet’s aim is to crudely shock the populace and re-set national expectations, it needs to identify the benefits of such an approach (apart from partisan political interests). The 2018 consultation paper did not do so, and no material benefit can be gleaned from the Bill’s long-winded Regulatory Impact Statement (RIS).

It must never be forgotten that New Zealand’s sacrifices in the cause of climate change mitigation will have no impact whatever on future New Zealand weather. Nor can it even influence the global average temperature that might be experienced by future generations. With CO2 emissions of about 0.1% of the world total, our efforts can never be more than symbolic. And any such symbolism should be aimed overseas, not at our own citizens.

Parliament has already considered and approved a formal statement of the benefits which can accrue to us from participating in the global effort on climate change. The National Interest Analysis on the Paris Agreement puts the case well:

As a small export-dependent economy, New Zealand relies on effective operation of the international rule of law and on the leverage created through active and constructive engagement internationally. If New Zealand is seen to free-ride on climate change, it would risk damaging New Zealand’s international reputation in areas such as trade and foreign policy as well as our influence in international climate change processes.

Avoiding the appearance of free-riding does not call for herculean efforts. Nor does it demand that any country should sacrifice its international competitiveness. It simply requires New Zealand to do its “fair share” relative to comparable countries – a criterion that we are already exceeding by a considerable margin\(^3^2\).

Leadership Abroad
Engaging in some obscure competition for international ministerial kudos is scarcely a worthy objective for any legislation. The whole notion of a political popularity contest (between insiders who attend conferences) smacks of a self-centred grand-standing approach to what must always be a team game – and serves to distract the focus from the common goal.

The notion of an inter-country numbers contest provides obvious incentives for governments to take their eye off the real ball – aggregate global emissions – and focus instead on reducing numbers in their own back yard, regardless of global effects. This inexorably leads to carbon leakage, outsourcing, reduced immigration, and eventually frontier restrictions such as ‘carbon tariffs’. None of this is in the interests of either New Zealand or the planet.

New Zealanders in general do not yearn to be the leaders of the pack or to win gold medals in this arena. For a decade or more, our mantra has been to “do our fair share”, so as to avoid ‘free-riding’ or ‘shirking’. This approach is incompatible with the vision of the Bill.

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\(^3^2\) See “Climate-wise, We Are The Champions”.
Our primary climate change policy goal should be to maintain our per capita emissions of long-term gases below the average of the 36 OECD countries. The new Climate Commission should aim for energy intensity and carbon intensity that are well below world averages. We should perform the challenging 2030 promise already made under the Paris Agreement. Achieving these goals would ensure that we are widely seen to be doing more than our fair share.

Only three years ago, this country committed itself to the Paris Agreement, which calls for “zero carbon” during the 50 years after 2050. This Bill disdains that recent commitment and now seeks to unilaterally move the goalposts to the period before 2050.

Why the change? No concrete reason for this national about-face has been offered – other than arm-waving rhetoric regarding “leadership” and “ambition”. Is there any real upside?

On the downside, there is a real risk that the gratuitous replacement of an agreed multi-lateral target by a ramped-up unilateral target will be received by middle New Zealand as yet a further example of the content-free stunts and gimmicks that have come to characterise the public discussion of climate change.

**Economy-wide Transition**

This dramatic language merely refers to the intention that New Zealand’s carbon sources and sinks will eventually be brought into balance. That is not in contention, but how is it assisted by a unilateral pathway that is steeper than required for the global target?

We have already seen two obvious New Zealand instances where the hyperbolic language of “transition” has driven damaging political decisions that run counter to both official advice and common sense. The first was the unheralded exploration ban for offshore oil and gas, perhaps wasting a huge $23 billion. The second is the proposed early elimination of natural gas (the ‘bridging fuel’) for firming the electricity grid.

In the EU, Governments subsidised the use of diesel rather than petrol cars for ‘transformation’, then reversed course more than a decade later. In the USA, the use of corn for vehicle fuel has been mandated and apparently cannot be undone. Despite many regrets, trees are still being felled in North Carolina so that wood pellets can replace natural gas at the giant Drax power plant in the UK.

Drama-laden interventions in the name of ‘transition’ or ‘transformation’ cause significant economic and reputational harm while adding nothing at all to global mitigation efforts. The actual pace of change envisaged by both the government’s modelling and the Productivity Commission’s report is quite sluggish and banal. Reductions in burning fossil fuel will have barely started by 2032, and all the heavy lifting is left to the 2040s.

The fact is that the steady arrival of technology tweaks in every energy-using sector will gradually grind down emission totals – the application of the Japanese quality control mantra of “constant improvement”. A typical example is found in the emission rate of new vehicles entering New Zealand which have reduced by 40% over the last 12 years to 180.7 grams of CO2 per kilometre\(^{33}\). This spectacular reduction rate of over 3% per annum was BAU – achieved naturally and without government intervention.

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\(^{33}\) Passenger cars are down to 146.3 grams, SUVs have reduced to 177.6 grams, and vans/utes are at 214.5
Our overall nation-wide energy intensity has been reducing steadily for over 30 years at a rate of over 1.5% per year. If that keeps up, we will reduce our per-capita energy use by about 50% by 2050 on a BAU basis. If we add the BAU changes assumed in the government’s modelling, that reduction will more than double – and all of that excludes any major advances in technology.

There is really little call for any additional climate policy changes, let alone an ‘economic transformation’.

**Timing**

A ‘transition’ that is out of phase with (and ahead of) global technology development will continue to ensure that the process will cost far more in this country than in any other. Only global technology advances can deliver the Paris Agreement target.

The Minister has expressed concern regarding the recent growth in emissions from the transport sector. This growth has been caused by increases in our population (due to net immigration) and our record levels of car ownership. Rather than addressing those causes, the Government has hiked the ETS and fuel taxes and subsidised infrastructure for electric vehicles – both actions that disadvantage the poor. The new vehicle feebate scheme transfers wealth to the well-off (buyers of new electric cars) from the battlers (low-income large families).

A more constructive “signal” would urge the early adoption in New Zealand of proven global technology changes/innovations that continuously improve energy efficiency. An example is action to facilitate the rapid introduction of transport-as-a-service to discourage private ownership of vehicles. Such an approach also has significant co-benefits in both upskilling our workforce and improving our balance of payments.

**Certainty**

The RIS extols the benefit of long-term legislated targets in providing investors with confidence in the future actions of New Zealand policymakers.

But a prophecy of circumstances 30+ years in the future will persuade no investor. In light of the time-value of money, expected returns during the first 5-10 years are always the drivers even in the case of long-term infrastructure projects. All projected cashflows beyond about 15 years ahead are discounted to zero, and treated as speculative.

Further, the prophecy is useless so long as the trajectory of emissions reduction remains unknown. Pursuit of the target will almost inevitably be back-loaded. “The climate scare could be all over by 2030” if two or three major emitters adopt advanced nuclear solutions (as seems likely).

Because a 2050 target with an unknown trajectory can tell us nothing about the shape of a 2020 carbon budget it can serve no useful purpose.

A target approved by Parliament (as opposed to being legislated by the Minister under s 224 of the Climate Response Act 2002) might conceivably add some certainty, provided it were:

- mainstream, in a global sense;
- perceived to be moderate and reasonable;
- supported by all current political parties;
- not so distant as to be seen as mere wishful thinking;
- set in cement for up to a decade
The sole target that exhibits all four characteristics is New Zealand’s NDC under the Paris Agreement. The process suggested by the Environment Commissioner has some prospect of replacing the NDC eventually, provided it is based on a bottom-up calculation/projection rather than a top-down figure plucked out of the air.

**Follow-ship**

In the Treasury notes anxiously (page 150) –

“There is a general risk that other countries do not act in kind, leaving New Zealand to bear the disproportionate costs of ambitious climate change action, with little to no material impact on levels of global warming.”

- but concludes that “this risk is highly unlikely”.

It falls to the Select Committee to decide just how likely it is that either the five major emitters or our six principal trading partners will adopt the date 1 January 2050 as their decarbonisation deadline simply because New Zealand did so.

The fact is that all of our major trading partners have already considered but declined to adopt the year 2050 as their target. China and India believe they have no moral obligation to decarbonise at all. The USA will accept no targets. The Asia-Pacific countries of Australia, Canada, Japan, South Korea, Singapore and Canada have no intention of over-shooting the Paris Agreement. The EU has recently declined to do so.

Any country’s rate of ‘transition’ will directly reflect that country’s rate of adoption of technologies/innovations that reduce the carbon intensity of its economy.

Being on the ‘bleeding edge’ of carbon deprivation is both risky and expensive. 99% of new technologies are developed elsewhere in the world and suffer lengthy periods in a ‘beta’ phase before being rolled out at scale. Being first in the field always means high-risk, including the risk of backing the wrong horse.

If New Zealand volunteers for an economic burden costed at $300 billion while similar handicaps are eschewed by our trading partners, we must inevitably lose international competitiveness along with commensurate losses of jobs and prosperity.

All this raises the question of why New Zealand politicians (and the Treasury) should believe they have certain insights that have been denied to their counterparts in comparable countries.

It is hard to disagree with the recent comments of former Deputy Prime Minister Barnaby Joyce:

“Australia will be the catalyst to a global epiphany and the totalitarian Chinese regime will follow our lead because of our righteousness followed by India and the United States.

No, I don’t think that will happen. I hate to say it but I doubt the majority of people on the planet, give a toss about the Paris Agreement. I would be amazed if one percent of the planet could competently explain it.”

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34 The UK is but part of the EU – and is currently overpowered by its Brexit issues. Incoming PM Boris Johnson has generally voted against measures to prevent climate change. Johnson has described climate concerns as a “primitive fear” that is “without foundation.”
The Short-lived Gas

Throughout 20 years of parliamentary debate about climate change policy, all participants have at all times proceeded on the basis of certain assumptions that:

(i) the science was settled in regard to the warming effects of methane;

(ii) long-lived and short-lived gases were fungible and could be bundled together;

(iii) the global warming potential of methane was 21 (later 28);

(iv) New Zealand as a whole contributed significantly to global warming;

(v) methane comprised about 40% of New Zealand’s annual contribution.

In the past couple of years, we have discovered that all five of those assumptions were quite wrong. These new insights are still being absorbed, and this is no time to be enshrining untested and tentative methane-related opinions into statute law.

Instead, there needs to be a wide-ranging public enquiry into both the net warming attribution and the annual impacts of steady-state methane production and the current realistic means available to minimise those impacts.

First game-changer

A peer-reviewed research paper referenced as Steinkamp et al (2017) disclosed for the first time that “the terrestrial biosphere in New Zealand is estimated to be a net CO2 sink, removing 98 (±37)Tg CO2 per year from the atmosphere on average during 2011–2013”. During the two years that have since passed, these research findings have not been challenged or called in question in any way.

The “terrestrial biosphere” is a collective description for all the farms and forests (LULUCF) in the country. Those farms and forests can act as both sources and sinks of CO2 but this top-down study found that they jointly removed more far more of the greenhouse gas than they produced and more than offset all the CO2 generated by the burning of fossil fuels.

This was a surprise. The same period’s National Inventory Report (NIR) compiled by the Ministry for the Environment found a net sink of only 27(±14)Tg per annum. Part of the 71Tg disparity (about 26Tg) could be reconciled but most could not. The researchers note that:

“Carbon sequestration by grassland and soil carbon could also play an important role in causing differences between the two methods, as these processes are not included or fully resolved in inventory reporting but would be seen by the inversion.”

It is obviously possible that our pastoral farms may be providing a sink for all of our net annual CO2 emissions without the necessity to plant any further pines. Until these figures are reconciled, it is difficult to offer any firm conclusions regarding the global warming (if any) attributable New Zealand farmland.

Second game-changer

Only a year ago, a further research paper, Allen et al (2018), appeared in a leading scientific journal: “A solution to the misrepresentations of CO2-equivalent emissions of short-lived climate
pollutants under ambitious mitigation”. This research took the legs out from under the anti-livestock rhetoric that has permeated the New Zealand climate change debate since the days of resistance to Helen Clark’s “fart tax” in 2004. In particular, it established two key new facts:

• no herd of cattle or flock of sheep will delay the “global peaking of greenhouse gas emissions” (the target of the Paris Agreement) unless the head-count of animals increases

• the global warming potential of methane is best calculated by a mathematical formula dubbed GWP* which is only about one-quarter the formula previously used;

The ramifications of these two facts are profound. Effectively, steady-state livestock herds are best seen as both sources and sinks of methane that contribute virtually zero additional CO2-equivalents to the atmosphere over the medium term. And New Zealand’s aggregate livestock units have been perfectly stable for many years.

It now turns out that the volume of greenhouse gases attributed to New Zealand have been grossly exaggerated. Once the 40% previously put down to methane disappears, New Zealand is seen as having very low per-capita emissions of CO2-e and the country’s share of global emissions is reduced from 0.16% to an even more trivial 0.09%.

The authors of this seminal paper include two distinguished New Zealanders – Climate Ambassador Adrian Macey and leading climate scientist Professor David Frame – while three of the remaining five are from the Environmental Change Institute at Oxford University. Despite the paper’s dramatic impact on the science of methane warming, it can no longer be regarded as controversial. Its reasoning has not been questioned and it is explicitly recognised by the IPPC’s use of GWP* in its Special Report 1.5.

Incentives for livestock farmers?
The lead author, Professor Myles Allen, says a stable herd can still have tiny residual warming effects. However, if the herd’s digestive efficiency is improving by only “one third of one percent per year… then that herd is no longer adding to global warming”.

He then says in a further speech that if New Zealand reduced methane emissions by 30% over the next 30 years, that would actually contribute to global cooling:

“If a farmer is providing a service to the rest of the country by compensating for other people’s global warming, then that farmer might want to make a case that they should be compensated for that.”

This suggestion is already accommodated under the ETS by s 64(1) of the Climate Change Response Act, which provides that:

A participant is entitled to receive 1 New Zealand unit for each whole tonne of removals from the participant’s removal activities, as calculated in accordance with this Act.

In my submission, this existing incentive should be reinforced by the Bill. Where parts of hill country farms are subject to erosion or otherwise suited to forestry, the landowner should be motivated to reduce his flock and receive NZUs equivalent to the estimated tonnage of CO2-e that is thereby permanently removed from the atmosphere.

35 Because for every new molecule of enteric methane produced a forerunner molecule expires. Sources are matched by sinks.
The new Commission should be requested to assess the economic cost of such flock or herd reductions, in various categories, and measure that cost against yardsticks for the per-tonne cost of alternative climate action. Specific policies can then be designed based on full information.

To the extent that livestock-cleared land is subsequently afforested, the forest owner will, of course, remain entitled to the usual NZU incentives for that activity.

**Paris Agreement**

It has been argued that, in order to achieve the long-term temperature target of 2°C above pre-industrial levels set out at Article 2 of the Paris Agreement, it will not be enough for countries to stop increasing emissions but they will also have to find ways to reduce the extant atmospheric concentration of greenhouse gas. A reduction of livestock numbers could contribute to that longer term objective.

Article 4 of the Paris Agreement addresses this question directly:

“In order to achieve the long-term temperature goal set out in Article 2, Parties aim to reach global peaking of greenhouse gas emissions as soon as possible … and to undertake rapid reductions thereafter 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.”  [emphasis added]

The intention of this Article is unmistakable. First, parties to the agreement must reach global peaking – and only then will they turn to reductions. The object is to achieve a source/sink balance after 2050.

The New Zealand Parliament has already ratified Article 4 and now needs to honour its unequivocal requirements. Doing so will also help abide by the injunction in Article 2(1)(b) to “foster low greenhouse gas emissions development, in a manner that does not threaten food production.”

**Unsettled science**

In little over two years, both the method of methane accounting and the science of methane warming have been shaken to the core by new research. *Allen et al* notes that most of the developed world is focussed on the production and impacts of CO2, so that enteric methane has been relatively neglected. How much more is there to be discovered or corrected?

There remains far too much scientific and other uncertainty to form a solid foundation for any first-of-a-kind legislation. The IPCC’s Sixth Assessment Report is in draft but will not be finished with its peer-reviewing timetable until 2022. Other relevant recent papers are published or in the pipeline but are yet to be absorbed and/or challenged by the very deliberate process known as “the scientific method”:

- *Allison and Sheahen (2019)* finds that the infrared re-radiation capacity of both methane and nitrous oxide is confined to narrow sections of the spectrum that are already saturated by water vapour and CO2 and therefore make no contribution to warming.
• Reisinger, A (2019) has produced a ‘note’ of some modelling he has undertaken for the Parliamentary Commissioner for the Environment (PCE) which suggests that some methane breaks down into ozone, which can have a warming effect in the troposphere. He argues that 10-20% of methane warming arises post-decay;

• Van der Lingen (2009) points out that we have no idea why New Zealand atmospheric methane measurements were static while livestock numbers were rising but have increased after the numbers stabilised;

• McKinlay, J (2018) finds the atmospheric half-life of methane is 6.25 years over a hundred-year horizon;

• Flood, W (2011) shows it would take about 360 years for the atmospheric concentration of methane to double and it would then give rise to about one thirtieth of the warming caused by a doubling of CO2.

As far as I am aware, none of these papers (except Flood) have yet been independently peer-reviewed or accepted for publication by a scientific journal.

In my submission, the new Commission should establish a hearings committee to undertake a public enquiry into the reasons, if any, why New Zealand should be the first country to regulate emissions of biological methane, and whether any such emissions should be included in the National Inventory Report. The terms of reference should include the current science relevant to methane production, suppression and accounting (reconciling the disparity between top-down and bottom-up inventories found in Steinkamp et al).

Methane and ETS
The purpose of “putting a price on methane” is to incentivise a farmer to reduce her output of the gas. This implies that when reduction occurs she will be rewarded by a levy reduction. But this can work only if the output of every farm is accurately measured and reductions (say by successful use of a vaccine) are quantified and recorded. This is administratively impossible.

This quandary has been the subject of an April report by the Government’s Interim Climate Committee, but the report is being held secret until after the date that submissions on the ‘Zero Carbon Bill’ have closed. Perhaps a solution has been invented.

All official advisers appear to have advised against including short-lived gases in the ETS including the PCE and the Productivity Commission. Professor Allen has added his voice to the chorus.

Target?
At first blush, it might be thought that a target should be fixed for the stabilisation of methane at current levels. On further examination, however, it becomes clear that such action will only tend to delay the global peaking of greenhouse gas emissions.

As there is no proven technology for reducing livestock methane other than improving efficiency, any regulation or reduction plan is likely to lead to a reduction in New Zealand livestock numbers. Such a result should be avoided at all costs because:
(a) 90% of production is exported to other countries;

(b) New Zealand is the world's least methane-intensive supplier of livestock products, by a wide margin\textsuperscript{36};

(c) any production lost from this country will be replaced by products from a more methane-intensive supplier;

(d) such substitution would be wholly counter-productive to the common global aim of “global peaking” as soon as possible.

New Zealand legislation already recognizes that re-location of commodity production to less efficient geographical areas can only exacerbate global warming. This principle must be consistently applied.

**Farm forestry**

The PCE has recommended that all credits for new forest sinks should be channelled to offset methane rather than long-lived gases. But if livestock numbers are stable and there are no net additions to atmospheric methane, reduction of methane will have much lower priority (at least until 2050) than reduction of CO2.

Farmers should be encouraged by issue of NZU’s to contribute to the national CO2 sink by planting a non-plantation copse of trees wherever they may choose. This should be achieved by amending the narrow definitions of “forest land” and “forest species” that appear in section 4 of the Climate Change Response Act.

\textsuperscript{36} New Zealand methane emissions per tonne of dairy products are less than half the volume in Ireland, the second most efficient supplier to world markets
The primary purpose of the Climate Change Response Act 2002 is “to enable New Zealand to meet its international obligations under the UNFCCC Treaty and the Kyoto Protocol”. As yet, there is no reference to the country’s more recent obligations under the 2015 Paris Agreement.

The ‘Zero Carbon Bill’ seeks to repair this omission by adding:

“provide a framework by which New Zealand can develop and implement clear and stable climate change policies that contribute to the global effort under the Paris Agreement to limit the global average temperature increase to 1.5°C Celsius above pre-industrial levels;”

Curiously, the Bill omits all of New Zealand’s international obligations under the 25-page Paris Agreement, except for one cherry-picked portion of one cherry-picked sentence.

The selected sentence is taken from Article 2 of the Agreement:

“This Agreement, in enhancing the implementation of the Convention, including its objective, aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by:

(a) Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change;

(b) Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production; and

(c) Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.”

The Bill creates irreconcilable conflicts in that it implies that New Zealand need only comply with part of an international agreement that has been ratified by Parliament. A long-established principle of statutory interpretation holds that the express mention of only one part of a document denotes the exclusion of the rest of that document.

Few New Zealanders will understand why the Bill ignores (or implicitly repeals) the 2°C figure that has permeated climate diplomacy since 1996 and is the sole “target” mandated by the Paris Agreement. Despite the Agreement’s lack of legal force, the international community has firmly declared that this level will be “held”

The contrasts with the reference to 1.5°C (a last-minute addition at COP21), which merely urges signatories to “pursue efforts” to do even better. It is not a target. It is merely aspirational and there is no language to suggest that anyone expects it to be achieved.
Wording conflicts
The Bill’s wording causes drafting problems in that it relies upon terms such as “pre-industrial
levels” and “global average temperature increase” that are not defined in the New Zealand Act
and gain their meaning only by a reading of the Paris Agreement.

A further problem is that having two different sets of wording to describe what is presumably the
same aspiration can only create future disputes and debates. If Parliament intends to respect the
Paris Agreement, as it has previously averred, then the least confusing approach is to simply say
so.

There can be no objection to New Zealand mimicking the 1.5°C aspiration in its domestic
legislation, as long as its context remains unchanged. The way to do this is to amend clause 4 of
the Bill to add “the Paris Agreement” into s 4(1)(a) of the existing Act and to replace the current
wording of the Bill with:

“provide a framework by which New Zealand can continue to develop and implement clear
and stable climate change policies that contribute to global efforts under the Paris
Agreement;”

Zero prospects of 1.5°C
As the IPCC’s SR1.5 finds the earth has already warmed by 0.87°C since pre-industrial times
(ie 1875), it is currently some 0.6°C short of the aspired level of 1.5°C. Projecting forward the
warming rate of 0.13°C/decade that has been observed over the past 40 years, one might
expect this level to be reached around 2060.

However, assuming a combination of worst-case scenarios, SR1.5 points out that the GMST
could increase by 0.6°C over the next 20-30 years. To permanently avert that possibility, CO2
emissions would need to decline by about 45% from 2010 levels by 2030. As pointed out here,
such a decline is inconceivable, if only because:

i) just three countries, China, USA and India, account for more than 50% of the world’s
emissions.

ii) China has made it clear that its emissions will increase by 50-100% by 2030 and
India’s emissions are expected to treble during 2015-30. Both feel fully entitled to
take these positions and will not be moved from them.

iii) If China and India are to jointly produce about 65% of worldwide emissions by 2030,
it is arithmetically impossible for the recommended 45% reduction to occur.

iv) aggregate NDCs under the Paris Agreement amount to a 30% increase by 2030,
which SR1.5 fears could eventually lead to 3°C warming – but very few countries are
even trying to meet their stated goals.

v) SR1.5 models require clean energy investment of $48 trillion by 2035. Even the
interest bill (at 5%pa) on this unimaginable figure would exceed total world
investment in childhood education and environmental protection combined. The
costs would massively exceed the benefits.
**Impact of SR1.5**
SR1.5 expects that the potential risks of species extinction and weather extremes, as well as decreases in food supply, health and economic growth, will be greater at the 1.5°C level than at the 2°C level. While this appears to be a commonsense conclusion, it does not appear possible to put any statistical probabilities on those risks.

Much of the media hype about SR1.5 is not borne out by its reported data. In regard to eustatic sea level rise, the climate change aspect which causes most concern:

“By 2100, global mean sea level rise is projected to be around 0.1 metre lower with global warming of 1.5°C compared to 2°C (medium confidence).” [0.1 m = 4 inches.]

Most integrated assessment models have concluded that relatively minor additions to the current GMST (up to about 2.2°C) would bring many additional benefits that would likely outweigh the additional costs. The SR1.5 report does not touch upon any of those benefits.

Some climate scientists, such as Dr Judith Curry have pointed out that:

“Over land, we have already blown through the 1.5C threshold if measured since 1890. Temperatures around 1820 were more than 2°C cooler.”

As the GMST rise of more than 2°C has already been experienced during the 1820-2000 period (according to Berkeley Earth) and coincided with unprecedented advances in human welfare, many feel that this hard empirical evidence is more persuasive than the predictions of unvalidated computer models.

**Status of SR1.5**
Insofar as the 2018 ‘Special Report’ appears under the aegis of the IPCC it must be taken seriously. But its ‘Summary for Policymakers’ was not authored by scientists and appears in several important respects to conflict with “The Physical Science” (WG1) report of AR5 as well as the draft version of AR6. Nicholas Lewis discusses some of those differences [here.](#)

The Special Report was not peer-reviewed in the manner of Assessment Reports and its most extravagant claims are not supported by any cited authority.

The focus and flavour of the report might be gleaned by some of the following statistics from just one chapter:

- The word "poverty" appears 151 times (and another 94 times as page headers)
- The word "inequalities" appears 54 times (+ 94 page headers)
- The words “inequality” and “gender” each appear 45 times

**Misrepresentation of SR1.5**
In other countries, particularly the USA and Australia, partisan lobbying for adopting 1.5°C as some form of target have proven to be highly divisive.

Although the report’s detailed findings regarding the sea level rise and other pre-adaptation effects of this temperature are not particularly alarming, it has been widely exaggerated as

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38 eg The Ocasio-Cortez “Green New Deal”. 
heralding a dystopian planet. The best-known proponent of this propaganda asserted that "the world will end in 12 years if we don’t address climate change".

It is instructive to note the recent admission by the actual author of the Green New Deal – which calls for a multi-trillion-dollar ‘transformation’ of the US economy – that the GND was always about wealth inequality and “wasn’t originally a climate thing at all”.

Mr Chakrabarti is quoted as saying:

“Do you guys think of it as a climate thing? Because we really think of it as a how-do-you-change-the-entire-economy thing.”

What's the difference?
The official target is 2°C since “pre-industrial levels”, which is taken by the IPCC to be the period 1850-1899 (mid-point being 1875). The IPCC’s Special Report 1.5 estimates that the global average temperature has already risen 0.87°C during the period 1875 to 2016, so that there is approximately 1.13°C headroom before the target is reached.

The headroom before the 1.5°C aspiration is reached is only 0.63°C – about half that of the official target.

The extent of the economic pain imposed on voters by climate action is directly proportionate to the rate of reduction required in the demand and supply of energy. By moving New Zealand’s future target from 1.13°C to 0.63°C the required rate of change would be doubled.

In reality, the pain would more than double, because the low-hanging fruit is picked first and there is time for new technology to develop. Many economists contend that the economic cost increases logarithmically (rather than arithmetically) as the pace of change is raised.

This Parliament has no mandate to pass legislation doubling or trebling the sacrifices required of the New Zealand people. The manifestos of the parties offered no inkling of their intention to double down on the commitments made in the Paris Agreement.

If the New Zealand objective is to achieve an all-party and enduring consensus, it would seem vastly preferable to adhere to the ‘official’ target of 2°C.

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39 Former campaign manager and now chief of staff for Congresswoman Ocasio-Cortez
What Is A Climate Change Commission?

The ‘Zero Carbon Bill’ proposes the establishment of a new bureaucracy in the climate space. It does not replace an existing agency, department, quango, committee, or task force but comes on top of all the existing bureaucracy. So, what is it for?

5B The purposes of the Commission are—
(a) to provide independent, expert advice to the Government on mitigating the effects of climate change (including through reducing emissions of greenhouse gases) and adapting to the effects of climate change; and
(b) to monitor and review the Government’s progress towards its emissions reduction and adaptation goals.

Advising the Government on climate mitigation and adaptation, and monitoring progress, have long been the responsibility of the Ministry for the Environment. The sole changes here are the adjectives “independent” and “expert”.

Advice on What?
All political parties and MPs agree that all countries should contribute to progressively reducing global GHG emissions “as soon as possible”, and also that increasing resilience to weather extremes ought to be built up in a timely manner.

These trite goals have been political common ground for the past quarter-century and will continue to be so for the foreseeable future. No political division is likely to arise and no advice is required in respect of them. Other important aspects are also common ground:

(vi) the Paris Agreement seeks to “achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century” so as to prevent long-term average temperatures rising by more than 2°C.

(vii) the sole purpose of New Zealand climate policy is to contribute to this global effort. (Our local emissions, at 0.1% of the global total, can have no detectable effect on future world climates).

(viii) reducing New Zealand net emissions unavoidably calls for substantial economic sacrifices, and modelling shows that the extent of that ‘economic pain’ is directly proportional to the rate of change.

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40 Article 4.1

41 I use the term “economic pain” in the widest sense to include all welfare losses that result from coerced increases in energy prices or losses of foreign earnings

42 I use the term ‘rate of change’ for the speed of induced reductions in NZ net emissions from their reported 2005 levels. e.g. 25% by 2030 (NDC); 80% by 2050 (UK); 100% by 2100; etc
New Zealand’s optimal future rate of change cannot be finally determined by quantified cost/benefit analyses or other technocratic means, because the nature and scope of the benefits are debatable and cannot be quantified (i.e. benefit evaluations are mainly subjective).

The rate of change in any period must be compatible with the Governments’ other economic, environmental and social objectives for that period.

As none of the above matters are in contention, or likely to be disputed in the future, they obviously would not require advice from a Climate Commission. What will always be up for debate is the appropriate rate of change from time to time.

Appetites for economic pain vary widely, and for a wide variety of reasons. Because the “correct” level is a mishmash of quantitative and qualitative factors and is ultimately a matter of opinion/intuition, it cannot be calculated by technocratic means and has to be determined politically. In a democracy, of course, that means it must be decided by a majority of the voters, either directly or through their elected representatives.

How can an unelected Commission help with such a political process? Its opinions or biases on such issues can be accorded no more weight than any other group of voters. However, a Commission could certainly offer a major contribution by operating as the independent (i.e. non-political) fact-finder and issue-analyst in respect of the core elements that will or should matter to the political decision-makers. Insofar as those elements are quantitative, it can and should play the major role.

If that is to be done, then those key issues need to be spelled out in the legislation. This Bill is the opportunity for the whole Parliament to identify the matters that future Ministers will be legally bound to take into account.

Review, Advise, Recommend

The proposed functions of the Commission are set out at 5J. All of these duties would normally be the responsibility of the Climate Change section of the Ministry, which routinely conducts public and departmental consultations, then services and chairs an officials’ committee (including Treasury) which in turn reports to a cabinet committee. That’s how the Kyoto and Paris targets were determined by National-led governments in both 2009 and 2015.

Part 6 of the existing Act requires the Minister to set and review emissions targets, after consulting with interested persons and considering “any matter he thinks relevant”. While the legwork for these is done by the Ministry, the responsible Minister can and does seek reports from all manner of ad hoc committees – from “Doing NZ’s Fair Share” (Caygill Report) of 2011 to “Path to a Low Emissions Economy” (Productivity Commission) of 2018.

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43 A fiscal budget needs to orchestrated. e.g. rapidly rising diesel prices could potentially torpedo an Administration’s whole programme for e.g. stimulating employment, or reducing poverty

44 I will refer to this political issue as “Appetite for Pain”. Activists refer to it as “Ambition Level”.
An existing Crown Entity, the Environmental Protection Authority also has extensive duties under Part 4 of the Act and the Parliamentary Commissioner for the Environment reports directly to Parliament on climate matters. There is currently an Interim Climate Change Committee, a Transition Hub, and an ETS advisory committee. Wellington is seething with climate change advisers. But they are all quite rightly seen as contractors to the current Minister, delivering that Minister’s policy, priorities and promises. There may still be room for an independent voice.

“Impartial”
Independence is valuable in enhancing public acceptance of the Commissions’ advice – an important consideration in such a highly politicised area. If the unelected Commission is perceived to be usurping the prerogative of the voters, it will inevitably attract constant criticism/opposition, as well as constant efforts to replace the commissioners. As argued above, all clearly political decisions must be taken by elected politicians.

However, the Bill is currently so drafted as to imply that the Commission should also exercise the political calculus on the rate of change, even if finally subject to an overrule by the Cabinet. This needs to be tidied up, by focussing the Commission on the specific issues mentioned in 5L of the Bill. I expand on this in Writing Budgets And Plans.

“Expert”
Curiously, the word “expert” has been inserted in 5B(a) of the Bill, although it is not defined and does not appear elsewhere in either the Bill or its parent Act. The dictionary meaning is “possessing specialist skill” but it seems clear from 5H, and from the list of functions, that Commissioners will need to be generalists who have a wide range of experience and knowledge.

A committee of experts (say economists) would add little value to the existing advisory functions of the Ministry, which can call upon endless experts for opinions on a wide range of narrow issues. The advantage of independence becomes illusory, because “experts” are by definition loyal only to their discipline and impervious to outside influences and consequences.

In most areas requiring specialist expertise, different schools of thought develop. As all lawyers know, experts are usually available on either side of any contested technical issue, so an outcome can readily be pre-determined by the selection of a sympathetic practitioner (whose views are often clear from published papers). The proper role of that category of persons is in making submissions to a Climate Commission – not sitting as a Commissioner to judge the merits of submissions made by experts from an opposing school of thought.

The adjective “expert” should be excised from 5B.

Partisan Role
The Explanatory Note in the Bill says the Commission “will help keep successive governments on track to the long-term mitigation and adaptation goals” – which suggests some sort of watchdog role to ensure future Ministers don’t lose the faith.

That impression is further reinforced by the Bill’s formal Regulatory Impact Statement which is quite unabashed:
A Climate Change Commission is a transparency and accountability mechanism to provide independent, expert advice beyond short-term considerations and political cycles. It will hold successive governments to account for progress on reducing emissions and building climate resilience.

And –

This is a way of addressing the intergenerational challenge of climate change and ensuring transparency and accountability throughout New Zealand’s transition to a low-emissions and climate-resilient economy.

All this smacks of an underhanded approach. While the Bill overtly declares an intention to secure sound and credible advice, the real purpose is to apply political pressure to future MPs and Ministers for a pre-determined outcome. The Commission is to be just another lobby group!

This won’t work. If the public were to discern that the Commission is really Greenpeace in drag, the authority of its recommendations would be heavily discounted by all but the 15-25% tribal group who already have outsize climate pain appetites.

In light of the Ministry’s apparent agenda, it seems essential to add a 5B “purpose” that the Commission will strive to balance the rate of reduction of emissions with the ability of the economy to absorb that rate without causing undue hardship, increases in poverty, reductions in the delivery of government services or in the general standard of living45.

Membership

If the Commission’s role is to be intensely political (which has been opposed above), its make-up would need to reflect the choices of the electorate. Each political party should have the right to appoint members, in proportion to their Parliamentary seats.

If, on the other hand, the RIS is wrong and the Commission’s role is to establish all relevant facts and to analyse policy options, then the selection process proposed in the Bill, which allows for consultation, should reduce controversy and enhance the Commission’s standing. In the interests of bi-partisan acceptance, 5F should provide for the Minister to consult with other parties on the membership of the nominating committee (in practice, it would help if at least one member should be nominated by the Opposition).

The Explanatory Note explains that:

Consideration was not given to options where—

• the membership of the Commission consisted of stakeholder representatives, as this was considered to jeopardise the ability of the Commission to provide independent advice;

45 As James Shaw is supremely optimistic that emission cuts will be painless, if not stimulatory, he should have little objection to new clauses aimed at limiting downsides.
• the collective expertise required of the Commission was prescribed in more detail, as this was considered to allow insufficient flexibility for the considerations of the Commission to evolve over time;

In respect of the mitigation of long-term and short-term gases, the Commission's principal role is to advise the Government on its five-year Budgets/Plans and to monitor their progress. Each Budget will be devised iteratively with its accompanying emissions reduction plan (5ZE) and this task will be dominated by economics in both macro and micro (behavioural) disciplines.

Other useful experience would be in finance, accounting, transport logistics, law, electrical engineering and bioscience – but fine-grained technical expertise should be provided by outside consultants and not by Commission insiders.

In a small country, the constant risk of conflicts of interest is often countered by appointing academics to government boards. This should not be contemplated here. The task of designing workable, cost-effective and least-regrets policy instruments affecting the whole economy, and accurately quantifying their effects for six years, demands hard-headed practical judgment.

Obviously, there is no single answer. My dream team would be secondment of a High Court judge (with extensive commercial experience) as chair, two economists, a retired Treasury Secretary or similar, a civil engineer, two experienced business CEOs, one entrepreneur/small business owner, a retired Mayor, and the Maori representative. None should be chosen for their specialist expertise.

Given the budgetting/planning work of the Committee and the high value placed on independence (from the Ministry for the Environment), it would be best if the Commission were serviced by The Treasury.
The United Kingdom Precedent

“The Climate Change Act’s real purpose is not to cut global greenhouse gas emissions. Rather it is to demonstrate British climate leadership. While politicians flatter themselves as climate saviours, the costs are borne in worsened business competitiveness and squeezed household budgets that weigh most heavily on the poorest in society. In one regard though, the CCA has succeeded in its aim as a demonstration project. No other serious country will do anything quite so foolish in the name of saving the climate.”

The UK Climate Change Act of 2008 is the sole precedent for the “Zero Carbon Bill” currently before the New Zealand Parliament.

It was passed a year before the Copenhagen conference (COP15), after it had become apparent that the Kyoto Protocol could not significantly slow the growth of global emissions. In the absence of any effective multilateral effort under the UNFCCC, the UK’s unilateral demonstration project was intended to provide leadership for the rest of Europe, and thereafter the world. At that time countries were competing to 'set the standard' in climate policy.

After the failure of COP15, however, unilateral action fell from favour. While the UK precedent has been widely discussed and even lauded, no country anywhere has so far chosen to follow it.

Now, the Paris Agreement has changed everything. As a leading participant in devising its multilateral concepts, unilateralism is now unthinkable for New Zealand, and the outdated UK Act no longer has much utility as a precedent. A consensus standard has been set and climate policy has become a team sport. With no aspiration to follow in the UK’s footsteps, we should now consider only cherry-picking those limited aspects of the UK precedent that seem to have worked and are fitted to our time and space.

Leadership

“Leadership” was the avowed purpose of the UK Act and is the first over-arching purpose of the New Zealand Bill. It embraces the conceit that one (small, Anglo) emitter has been endowed with special insights into how other countries should behave, or how foolhardy/virtuous other governments ought to be, in addressing the shared but complex challenge of decarbonising the modern world.

During the passage of the UK Bill, only five (Conservative) MPs demurred: “There is, of course, merit in setting an example and taking a lead, but what if no one follows?” the Hon Peter Lilley asked, “We should at the very least ensure it has binding effect only if a sufficient number of developed countries follow us – and that, I think, is unlikely to happen”. Andrew Tyrie declared it “a profound mistake to take the unilateralist route…the Bill would raise industry’s costs and enable China to take over Britain’s industrial base.”

47 The Committee, somewhat dubiously, claims that Sweden has followed aspects of the 2008 UK Act.
The Conservative shadow minister, Greg Clark, supported the Bill declaring: ‘I am a multilateralist. I do not believe that Britain should act alone, but this Bill provides for the Secretary of State to give leadership in our international negotiations and, at all time, to have the flexibility to ensure that other countries come with us’. He was mistaken - no such flexibility existed in the UK Act. Nor does it exist in the New Zealand Bill.

By definition, the “leadership” ambition implies that the pace of change in the UK will consistently exceed that of other developed countries. However, that intention is at best ambivalent. The UK’s post-legislation impact assessment found (p6) “The economic case for the UK continuing to act alone where global action cannot be achieved would be weak… This highlights the central importance of co-operative and co-ordinated international action on climate change.”

Similarly, the New Zealand government’s economic modelling is based on a key assumption that its major trading partners will adopt a rate of change that is comparable to New Zealand’s pathway under the Bill. Were it otherwise, our international competitiveness would be damaged, perhaps seriously, resulting in a sharp drop in our relative living standards. The Government is yet to explain how the apparently conflicting goals of leadership and comparability can both be achieved at the same time.

A critic, Rupert Darwall, takes strong exception to the UK leadership goal:

“If Britons think they are making sacrifices to reduce global emissions, they are mistaken. The Bill is principally about using them as guinea pigs for a radical, unprecedented experiment in the rapid transformation of a carbon-based economy which the rest of the world is meant to follow. It provides no get out of jail card if the world takes no notice.”

The Climate Change Committee

All of New Zealand’s political parties seem attracted by the device of having the complexities, disputes, fashions and passions of climate change filtered through an independent non-political vehicle, before they are finally called upon to bite the high-risk political bullets. There is much to like about this approach.

“Independent” or “non-political” in relation to the proposed New Zealand Commission is taken to mean that it will be patently evidence-driven and widely perceived as impartial or even quasi-judicial in deliberating upon the contentious issue of the current and pending pace of change.

Unfortunately, this non-political perception has never applied to the UK Climate Committee. Like the Act that gave it birth, the Committee has presented itself as a cheer-leader for ever-faster increases in Ambition Levels/Pain Appetites. Like Professor Flannery of the erstwhile Australian


50 Therefore, the UK aims to be always on (or ahead of) the ‘bleeding edge’ of technology changes.

51 DECC, Climate Change Act 2008 Impact Assessment (March 2009)
Commission, Lord Deben has relentlessly courted publicity as the face of Britain’s climate-change-fighters, rather than being the neutral adjudicator or well-grounded assessor wading through the conflicting evidence.

The Act envisaged that the Committee would balance ambition with a thorough understanding of the potential economic pain in store. Unlike the New Zealand Bill, the criteria for membership of the UK Committee, leans very strongly in favour of economic and business nous rather than academic distinction or environmental expertise. Specifically, Schedule 1 of the UK Act calls for experience and knowledge in –

(a) business competitiveness;
(b) climate change policy at national and international level, and in particular the social impacts of such policy;
(c) climate science, and other branches of environmental science;
(d) …[not relevant to NZ]
(e) economic analysis and forecasting;
(f) emissions trading;
(g) energy production and supply;
(h) financial investment;
(i) technology development and diffusion

Unfortunately, the UK outcome has been somewhat different from the legislative intention, with a high proportion of professorial members of the Committee.

Budgetting
The Committee’s obligations to advise on five-year budgets have provided a precedent for the New Zealand Bill. However, the Bill takes up only some of the areas that must be “taken into account” in the UK, notably omitting (a) fiscal circumstances; (b) energy policy; (c) sectoral competitiveness and (d) fuel poverty, while adding the amorphous “inter-generational equity”.

The UK Act has a mandatory requirement that both the Committee in making its recommendations and the Minister in making his decision must take into account nine (potentially conflicting) factors:

(a) scientific knowledge about climate change;
(b) technology relevant to climate change;
(c) economic circumstances, and in particular the likely impact of the decision on the economy and the competitiveness of particular sectors of the economy;
(d) fiscal circumstances, and in particular the likely impact of the decision on taxation, public spending and public borrowing;
(e) social circumstances, and in particular the likely impact of the decision on fuel poverty;
(f) energy policy, and in particular the likely impact of the decision on energy supplies and the carbon and energy intensity of the economy;
(g) …. [Not relevant to NZ];
(h) circumstances at European and international level;
(i) the estimated amount of reportable emissions from international aviation and international shipping for the budgetary period or periods in question.
The UK Secretary may amend budgets (s 22), after advice from the Committee, “if there have been significant changes affecting the basis on which the previous decision was made”. In the New Zealand Bill, the Minister may not make any amendment without a prior recommendation for change by the Commission. This impediment to the elected Government’s authority is both inconsistent and wrong in principle.

As with the New Zealand Bill, the Minister is required (ss13,14) to prepare and report upon a five-year operating plan (policies and proposals) designed to ensure that the budgeted reductions will be met. Unlike the local Bill, the UK Committee has no formal role in the planning process.

**Has the UK Act succeeded?**

The UK Act inexplicably ignores the fact that its decarbonisation objectives were already being pursued under the EU-wide cap-and-trade system and that its emission targets had already been set by the EU Commission. The New Zealand Bill could fall prey to the same defects if it does not mesh the new framework with its existing ETS – and recognise that the nation has already committed to a formal and politically binding Nationally Determined Contribution under the Paris Agreement.

Darwall emphasizes that the allowable annual volume of UK emissions is fixed by negotiations with the EU allocating quotas under the cap imposed by the EU ETS. So any emissions reduced by one sector under the Committee’s policies simply allow headroom for another sector to increase its admissions. All the costs imposed by the Committee do not make an iota of difference to global warming – because the actual total volume of UK emissions has already been pre-ordained by the ETS cap.

In 2017, one of the world’s most highly-regarded energy economists, Oxford’s Dieter Helm, was appointed by the UK Government to review the compliance costs of the 2008 Act. The findings of the “Cost of Energy Review” are summarised on Professor Helm’s website.

The Review’s starting point is that the cost of energy is profoundly influenced by the detail of energy policy. Helm notes that the lowest-cost way of meeting emission-reduction targets is to set a universal carbon price on a common basis across the economy. However, rather than a straightforward carbon tax or ETS, a host of interventions now places state departments as the central arbiters:

“The implication of the state determining all investments is that the state – and not the consumer – is now the major client. Energy policy has been partly captured, with the result that our decarbonisation is slower and more costly than it need be; our security of supply is weaker than it should be; and households and industry pay too much for their energy”.52

The sheer number of interventions is so great, Helm says, that hardly anyone who should – ministers, officials, regulators and investors – can understand them all. In practice, the complexity and inconsistency of current interventions that has built up as a result of a sequence of ad hoc policies is a major source of inefficiency and has created excessive costs.

In the words of OECD economist Nick Johnstone, ‘using “two stones to kill one bird” is not usually a sensible policy prescription’. In a 2003 report, Johnstone concluded that:

“In many cases the use of a mix of policies will be at best redundant and at worst counter-productive. If a particular instrument is an economically efficient and environmentally effective means of meeting a given environmental objective, there is little sense in introducing an additional instrument.”

The New Zealand ETS (like the EU version) was designed as the country’s single decarbonisation policy instrument, so as to use the market to find the lowest-cost way to cut emissions. It introduces an equalised marginal abatement cost across all sources (and sinks) of long-lived gas emissions.

Conflicting ad hoc policies such as the government’s 100% renewable energy policy, the oil & gas exploration ban, freeing EVs from road user charges, subsidies for rail and public transport, etc – muddy the water to the point of defeating the original objective. This reflects the historically-disastrous tendency of politicians and civil servants to pick winners.

The “Guidance for Departments” (5ZL) clause in the Bill suggests that a multiplicity of instruments will not only be tolerated but are actively intended to proliferate over the 30-year life of the planning framework. As noted above, this is the antithesis of sound policy-making. The clause should be replaced by a direction that the “policies and strategies” in 5ZD–F will be limited to variations in ETS settings unless the Minister directs otherwise.

Planning hubris

In his summary (paras 12-15), Helm notes the pending challenges of supplying a more highly-digitalised economy, along with the coming of electric transport, with smart decarbonised electric energy at ever-lower cost. He warns that the future cannot be accurately predicted by planners:

“Tempting though it is to many observers to predict how this transformation is going to take place, and profitable to many lobbyists to persuade government that their specific technologies and projects are the right answers, the design of energy policy and the interventions to achieve the objectives should be driven by the uncertainty about the detailed shape of the decarbonisation path. In order to achieve the prize, it is important not to try to pick winners, and to focus on the framework within which the private sector brings new ideas, new technologies and new products to the end-user. Avoiding detailed intervention is a key to keeping down the cost of energy.” (emphasis added)

An appropriate process has the Minister taking political responsibility for the forward rate of change (and therefore the aggregate economic pain at the macro level) through the Budgetting process, while the “cap” effect of a well-calibrated ETS is capable of delivering the results required by those

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54 N Johnstone, *The Use of Tradable Permits in Combination with Other Environmental Policy Instruments*, OECD (7 July 2003), p. 4.
approved Budgets\textsuperscript{55}. The Minister will tighten the volume of NZU’s in circulation\textsuperscript{56}, causing a rise in the ‘carbon price’ and therefore energy prices. The consequent reduction in energy demand depends upon fuel price-elasticity at various levels – which is difficult to predict but (to a large extent) will be inversely proportional to disposable income.

Then, billions of individual decisions taken by energy consumers and producers will ensure that those aggregate welfare losses are minimised. Nobody can or should be required to predict the eventual future outcomes of all those decisions, as they will be incrementally determined over time. All that can be said with any confidence is that they will be different from what we now expect.

Welfare-maximisation (or cost-minimisation) ought to be spelled out in the Bill as the objective of the 5-year Plans. Once Budgets are set, the major role of the Government is not to augment the work of the “cap”, but to ameliorate and re-distribute its harsh and regressive consequences.

Helm also has concerns about the unprovably pessimistic assumptions that have been built into the Rate of Change by the Climate Committee. At para 14, he suggests that technological transformations over the coming decades are likely to produce ever-cheaper clean energy that could well over-shoot the statutory target:

“The CCC .. argues that any new technologies will have to be deployed before 2030 if they are to make much impact before 2050. This, together with the assumption that gas prices will rise by 30% by 2030, is a key rationale for the roughly linear profile of emissions reductions from now through to 2030. If the objective is limited to the CCA 2050 target, then the carbon budgets over-egg the early stages, and make the trajectory between now and 2050 more expensive than it needs to be. Indeed, with such early action in the linear trajectory, it may turn out that decarbonisation is achieved much faster.”

In the New Zealand case, this concern about early planning pessimism and “over-egging” is sharpened by the over-ambitious target of 2050 being set for full decarbonisation..

\textsuperscript{55} This is the process anticipated by the Productivity Commission. The ETS energy pricing instrument is analogous to the OTC interest pricing instrument – after the Government has set the inflation ‘budget’ through the PTA.

\textsuperscript{56} Possibly by reducing the s 86 allocations to vulnerable industries.
Two Stones For One Bird

It goes without saying that every true environmentalist will aim to avoid senseless waste. Scarce resources should never be squandered.

In most fields of endeavour, there is only one best practice approach and many flawed alternatives. The task of accelerating the “global peaking” of CO2 emissions is no different.

The new Climate Commission will establish and publish a yardstick marginal (economic) cost for the most efficient way for New Zealand to eliminate a metric tonne of global CO2 or its equivalent. All available resources should then be channelled to this cost-effective method. Other channels should not be pursued unless it can be shown that any one of them is of equal merit to the yardstick. Every sub-optimal method is a foregone opportunity and a waste of limited resources.

All inefficient or wasteful methods must be strongly discouraged by the Commission and the Government – if only because there is an obvious ceiling to the public’s appetite for economic pain in pursuit of climate policy. There are also competing demands that have equal or higher priority, such as the reduction of child poverty and homelessness.

Cap-and-trade

The framework envisaged by the ‘Zero Carbon Bill’ is that the Commission and Minister, working together, will develop a five-year budget/plan to reduce emissions and will then, almost automatically, implement those levels by changing ETS settings accordingly.

Our ETS scheme is a cap-and-trade mechanism. The Minister (ie the Cabinet), on the advice of the Commission, decides upon the level of the cap from time to time. Just as the Reserve Bank determines the level of national inflation by use of its single pricing instrument – the overnight cash rate (OCR) – so the Climate Change Minister/Commission will determine the level of national emissions by using a single pricing instrument – the cost of a NZU under the ETS.

No doubt there will be much pain and upset as this unfamiliar instrument is trialled. But the entire theoretical underpinning of the Bill states that a ‘right price’ WILL be found to deliver the desired outcome. The Productivity Commission and the NZIER have made their own guesses but the eventual answer will come from trial and error57.

ETS rules!

The New Zealand Initiative has strongly criticized the suggestion at the recent Local Government New Zealand (LGNZ) Conference that the RMA be amended to force Councils to take account of emissions in consenting decisions. Economist Eric Crampton says:

“All this is entirely and utterly pointless where consented activities already fall under the Emissions Trading Scheme. Under a binding ETS cap, every blocked development will just provide room for someone else’s emissions.”

The point being made is that the only thing that secondary or alternative policies can achieve is to move the burden from one group or sector to another. These policies cannot impact the aggregate level of New Zealand emissions because the Minister/Commission have the final

57 I will abstain from comment on the long track record of other central planners who have sought to calculate ‘right prices’.
control of that outcome. The Minister has his/her foot on the only brake, and all other well-meaning efforts have no more effect than flailing arms and loud speeches.

Auckland City has decided that it will require a climate change impact report with every consenting application. While this will add copious red tape, expense and delay to the consenting process, it will contribute nothing to the common aim of accelerating “global peaking” of greenhouse gas emissions. As to adaptation goals, the application should merely certify its compliance with the Minister’s current plan.

What about the market?
The raison d’être of “putting a price on carbon” is that, once the externality has been priced in, we can rely upon normal market forces to efficiently distribute the effects so as to impose the least possible cost to overall productivity and economic growth. In other words, the whole point of using an ETS is that it allows the market to work its usual magic. It harnesses capitalism to deliver the requisite results at least cost.

But this theoretically rigorous system is confounded if the waters are muddied by dozens of other non-market-related interventions occurring at the same time.

A hail of stones - one bird
As I point out in The United Kingdom Precedent, this has been a major flaw in that country’s scheme. Oxford's Professor Dieter Helm, was appointed by the UK Government to review the compliance costs of the 2008 Act. The findings of the “Cost of Energy Review” are summarised on Professor Helm’s website. His central point is that the inconsistency of current interventions that have accumulated from a sequence of ad hoc policies is a major source of inefficiency and has created excessive costs.

In the words of OECD economist Nick Johnstone, ‘using “two stones to kill one bird” is not usually a sensible policy prescription’. In a 2003 report, Johnstone concluded that:

“In many cases the use of a mix of policies will be at best redundant and at worst counter-productive. If a particular instrument is an economically efficient and environmentally effective means of meeting a given environmental objective, there is little sense in introducing an additional instrument.”

Where more than one instrument is used, Johnstone warns that:

• the objective of each instrument must be clearly defined, and the relationship between the two instruments must be properly understood.
• each must meet a legitimate policy objective which cannot be met more efficiently through the tradable permit system.

Scattergun approach
The most expensive and therefore lowest-scoring way to reduce national emissions would be a scattergun approach under which scores of officials attempt to contribute to the savings pool on the basis of good intentions rather than accurate measurements and full knowledge.

58 N Johnstone, Efficient and Effective Use of Tradable Permits in Combination with other Policy Instruments, OECD ( ), p. 4.

59 N Johnstone, The Use of Tradable Permits in Combination with Other Environmental Policy Instruments, OECD (7 July 2003), p. 4
For that reason, it is important that the draft Clause 5ZK be amended by striking out the words “the 2050 budget or an emissions budget” and substituting “an emissions reduction plan published under [section 5ZF]”.

Similarly, the draft Clause 5ZL(1) should be amended as follows:

The responsible Minister may issue guidance for departments on how to take a published emissions reduction plan into account in the performance of their functions, powers, and duties.

It would also be helpful if the Bill were to contain wording aimed at discouraging Local Authority politicians, Crown Agencies, and other enthusiastic amateurs from imposing on their stakeholders any material costs for the purpose of mitigating global warming without first consulting the Commission, through the responsible Minister, regarding the cost-effectiveness of their proposals. Above all, there must be a widespread understanding that the mitigation effort is a co-ordinated supra-national enterprise – not a regional, local or individual responsibility.

Such a caution might also assist in deterring uncosted political promises whose sole merit is as a retweet-able soundbite. A case in point is the recent proposal to seek leadership by setting a domestic target to achieve 100% renewable electricity. Another was the oil & gas exploration ban.
Writing Budgets And Plans

The primary duty of the proposed Commission is to recommend ‘emissions budgets’ for the net quantities of CO2-e within New Zealand’s responsibility, in successive five-year periods commencing January 2022. The budgets will be expressed in terms of sources and sinks for each greenhouse gas, and will include recommendations on how these figures might ‘realistically’ be met (along with risks and uncertainties).

Although the Minister has a veto over the Budgets and nominally has responsibility for preparing the consequent Emissions Reduction Plans, it is evident that these two processes will be iterative and largely carried by the Commission. In practice, Budgets and Plans will need to be considered together.

Budget Periods
The Bill requires the Commission to recommend no less than three Budgets by early 2021, all being in force albeit the second and third are dubbed “prospective”. This is unrealistic and reduces the credibility of all so-called Budgets. Nobody budgets 15 years in advance.

The Commission’s best guesses for years 6-15 years out should be ‘indicative’ only and described as ‘projections’. They will provide a picture of projected BAU during this period if there is no change in policy or technology as from the final year of the Budget.

The requirement to achieve a net zero level in 2050, with an unknowable trajectory, tells us nothing about the emission levels that should be budgeted by 2025. It is submitted that the 2050 target should be omitted and the Commission should instead be guided by the country’s published NDC which has committed New Zealand to reducing 2005 net emissions by 30% by 2030.

Factors to be taken into account

(x) International Relativity
As the objective of the policy is to either “do our fair share” (existing policy) or “leadership abroad” (possible over-arching purpose), the relationship between New Zealand’s efforts and those of comparable countries will be the first consideration of the decision-making Minister.

It is for the Cabinet of the day to decide which measures to apply, and the Commission’s role should be to provide a range of relevant metrics. As the UNFCCC provides different standards for ‘developed’ and ‘developing’ countries60, the 32 OECD countries are the obvious comparators – but statistics should also be provided for our six major trading partners61.

The Commission will debate and recommend the most relevant metrics from time to time. CO2 per capita, CO2 per unit of GDP, energy density, enteric methane and nitrous oxide per unit of

60 And because the OECD regularly reports climate statistics and evaluations for each of its members. It seems very likely that all future governments will support net emission budgets that are below the OECD average.

61 Australia, China, USA, Japan, EU and Korea
production, the Rate of Change from BAU, etc. The availability of confident relativity statistics will reduce the arbitrary and capricious nature of targets/budgets and greatly improve the chances of political consensus.

(ii) Likely Economic Impacts
Because the level of economic pain is the sole brake on the Rate of Change, it is essential that a decision-making Minister has the best possible estimate of the levels of pain likely to result from a range of potential reductions in emissions (long-term and short-term). Without this information, the Minister is unable to exercise her/his political mandate to determine the prevailing national appetite.

(iii) Cost-effective Options
The Bill should require the Commission to investigate and report on the most cost-effective emission-reducing options available from time to time. A benchmark cost should be established (for say 1MT CO-e) – likely the typical cost of planting pine trees on under-used land – and all alternatives then compared with this benchmark. A major question to be tested by the Commission is whether the medium-term price elasticity of motor fuels will permit rises in ETS levies to be a competitive contender. In other words, what is the economic cost of sharp rises in the pump price of (a) diesel and (b) petrol?

(iv) Technology Status
It is inescapable that the global rate of change will ultimately be driven by the worldwide rate of adoption of new technologies that significantly reduce the average economic pain per each MT of CO2-e reduced. If, for example, advanced nuclear reactors are commercialised and widely adopted during the 2020s, the rationality of ongoing investment in reducing New Zealand emissions may well be called in question. If new strains of low-methane-inducing grasses are developed, plans for reduction of short-lived gases will change everywhere.

(v) Social Impacts
As experience is gathered over the 30-year span of this Bill, statistical records should be maintained of the impacts of climate policy on “social, cultural, environmental, and ecological circumstances, including differences between sectors and regions” and “the distribution of benefits, costs, and risks between generations”. An assessment of the effects of coerced energy price rises in comparable countries will also be of real assistance to our future policy makers.

(vi) Global Effects
As emphasised elsewhere, the target is the GMST and the instrument is the decrease of global emissions. Interventions that merely cause emissions to move from place to place are counter-productive in that they almost always reduce aggregate efficiency (thereby increasing global emissions) and also squander communities’ appetites for pain to no useful effect. The Commission should therefore exclude from both Budgets/Plans and monitoring reports any additions or subtractions that are driven by the international relocation of plants or facilities that produce global commodity exports or import substitutes.

Similarly the migration of people (a major driver according to the Kaya Identity) in and out of New Zealand should be neutralised by recording aggregate (or, at the least, transport and household)
emissions on a per-capita rather than a whole-population basis. This innovation may well attract followers elsewhere as immigration/tourism cause such major distortions in some countries as to render national inventories useless. Fortunately the Paris Agreement allows contributions to be nationally-determined, so such improvements in record-keeping can be accommodated – albeit on a unilateral basis.

(vii) Climate Science
The IPCC’s Sixth Assessment Report (AR6) will be published in stages over the next two years and, in respect of long-lived gases, there will be no need for the Commission to go beyond the findings of Working Group 1 (WG1) for many years to come. However, it already seems likely (from the draft AR6) that the detailed science relevant to enteric methane may continue to be accorded low priority. As New Zealand has a unique interest, the Commission might well be directed to establish a wide-ranging enquiry into the empirical science of methane warming – which could complement the research efforts of NZAGRC in establishing this country as a centre of excellence in this important field.

Do Taxes work?
The mainstream view of economists is that the least inefficient way of inducing a decrease in CO2 emissions is to “put a price on carbon”. The desired “price” may be induced by either a carbon tax or an ETS (essentially a tax with post-hoc trading rights) and should be at a common level worldwide. Thereafter, normal market forces will operate to allocate all global mitigation investment into the geographic and sectoral areas which will give the best returns for the minimum welfare loss.

This pipe-dream is politically impossible. Developing countries fiercely protest their right to raise the standard of living of their respective populations to the levels long enjoyed by the developed nations, who have already exploited most of the earth’s “carbon budget”. Developed countries such as USA, Australia and Japan (and perhaps Canada, in the coming year) have debated but firmly rejected various versions of such schemes.

Instead, carbon taxes and ETS imposts are patchily applied around the world in sundry cities, states and nations at diverse scales and scopes. Only Europe has a supra-national ETS. Only New Zealand has a national ETS.

We have harsh taxes on motor spirits and an ETS take of nearly $900 million in the 2019 budget. This is all highly opportunistic and devoid of principle, with the government recently establishing a formal enquiry with the aim of reducing the retail petrol price.

While the economic assumption is that demand is always suppressed by price, the empirical evidence shows otherwise. During the 16 years up to 2012 (when crude oil reached US$150 per barrel), a petrol price increase of 80c per litre saw consumption rise by 24%. In the case of tobacco as well, harsh taxes have clearly failed to eliminate demand.

62 The common urge to ‘reinvent the wheel’ should be actively discouraged

63 Particular attention needs to be paid to Article 2 of the Paris Agreement which subordinates the goal of emission reduction to that of food production

64 Approximately $1 per litre of petrol, or 50% of the retail price.
In brief, the New Zealand experience has been that while “sin taxes” have plainly caused much hardship, they have consistently failed to bring about significant behavioral change.

Another drawback of tax-based policies (including ETS) is the unavoidable cynicism that assumes their real objective is merely to raise revenue. ‘Greenwashing’ is always resented, as was seen by the resistance of the “yellow jackets” in France. An option worth exploring is to follow the Canadian example and return the ETS revenue to taxpayers by an equalizing reduction in the GST take. Such an approach would increase credibility, and with it the public appetite, while also reducing regressive effects and minimising the economic damage of the ETS impost.

**Regressive effects**

Raising carbon prices is one of the most regressive instruments imaginable. Raising the price of diesel, for example, elevates the price of food and shelter and all the other components of the cost of living. It is "a great big new tax on everything" which raises the CPI and eventually the OCR. These basics consume a much greater share of the incomes of beneficiaries (whose benefits are no longer CPI-linked) than those of the better-off.

The price-elasticity of petrol is extremely low and the only people who will stop (or significantly reduce) driving are those who simply cannot afford to buy the extra litre. Better-off people just curse and pay the elevated price. This ineluctable fact is what caused the NZIER modellers to find that people in the bottom two income quintiles will be hit six times as hard as people in the top quintile. Such a disparity could never be acceptable in a traditionally egalitarian country.

Aware of the high potential for regressive policies, particularly in developing countries, the UNFCCC (COP21) was at pains to include a caveat within the Paris Climate Agreement itself. The operative clause (Article 2) is governed by the following proviso:

"This agreement ...aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty". [emphasis added]

The eradication of child poverty is a shared goal of all the current Parliamentary parties in New Zealand but is obviously quite incompatible with an ‘ambitious’ use of taxes to achieve a pain-filled climate goal.

**Technology**

Sustainable reduction of emissions will only be achieved by the development and early adoption of new/improved technologies on both the supply and demand sides of relevant markets, particularly the energy market.

The strongest argument against choosing an earlier decarbonisation date than envisaged by the Paris Agreement is that numerous technological solutions assists and solutions will undoubtedly continue to improve and reduce in price as time passes. As long ago as 2005, a multi-party Select Committee of the UK House of Lords unanimously agreed that the cost of reducing emissions would be directly proportionate to the speed of doing so.

The main conclusion of the well-reasoned report of that authoritative Committee was that international negotiators should be weaned away from excessive reliance on the "targets and penalties" approach embodied in the Kyoto Protocol. They concluded that “focussing on emissions targets will fail” and recommended that “Kyoto-plus should focus on technology and R & D".
This view is further supported in “Why subsidise more congestion?” and “The climate scare could be gone by 2030”

In “Energy solution hinges on better technology”, a recent thought-provoking article in ‘The Australian’, economist Bjorn Lomborg notes:

“Yet humanity has actually never experienced an “energy transition” — a shift from one set of energy sources to another set. Rather, we have added more and more.”

And:

“Politicians across the world happily promise to emit net zero CO2 by 2050, knowing they will be long retired from politics when those vows are broken. Achieving this will be almost impossibly expensive, likely provoking “yellow vest” street riots long before their conclusion.

Clearly, 99% of the future carbon-reducing innovations will be patented in ‘the rest of the world’. But, as I observed in “Why subsidise more congestion?” New Zealand can also play a role by deliberately being an ‘early adopter’ – not by picking winners, but by ensuring that all the myriads of roadblocks and red tape (such as the RMA) are rapidly overcome or circumvented.

**********
A Bang For Every Buck

Reducing emissions is expensive. Monetary resources are scarce. Every dollar spent on climate change mitigation is a dollar that is not available to spend on such other priorities as housing, or healthcare, or eradicating child poverty.

In this environment, waste is simply unacceptable. Every scarce climate dollar must be used to retire the maximum possible volume of emissions. So, how do we ensure we get the maximum bang for the climate buck?

Global peaking asap
The Paris Agreement sets out (Article 2) to –

"hold the increase in the global average temperature to well below 2°C",

by the declared aim of all the parties (Article 4) –

"to reach global peaking of greenhouse gas emissions as soon as possible".

In ratifying these Articles our Parliament signed up to a global strategy and New Zealand, as a small cog in this global wheel, remains committed to that strategy. While it retains responsible for its own tactical moves, it should never adopt tactics that are incompatible with the strategy.

New Zealand’s proposed new Commission must keep its eye firmly fixed on the “global peaking” aim, and recognise that the geographical location of emissions is not a relevant factor.

To enable this, the Select Committee must remove the draft Bill’s proposed clause 5W:

"Emissions budgets must be met, as far as possible, through domestic emissions reductions and domestic removals."

Yimby attitude
Clause 5W displays a self-centred and irrational impulse to say: “yes, in my back yard” (YIMBY). The Explanatory Note contains no explanation for this territorial focus, merely stating baldly that:

The Bill aims to support New Zealand’s domestic transition to a low-emissions economy. The Bill allows the Government to purchase reductions sourced from overseas to meet emissions budgets, but only as a last resort and not as a first choice.

The term “domestic transition to a low-emissions economy” is meaningless jargon and a distortion of the English language. It presumably refers to the reduction in energy-intensity and carbon-intensity which has taken place in the past decade and is likely to continue or even accelerate during the next few decades.

For New Zealanders, the most visible of all energy usages is probably the family car. In the past decade or so, the average carbon-intensity of all new cars has been reducing at a rate of over 3% per year. If carbon economy merely continues at the same rate, the average new car will reach zero before 2050. Is that process already an “economic transition”?  

The vehicle transition has been enabled by technology improvements adopted by overseas manufacturers and that will also be the likely source of future changes in all of our energy-using
sectors. This fact merely underscores the global, rather than domestic, nature of the “transition to low-emissions”.

If a billion dollars is budgeted for permanent afforestation in any period and the options are to reduce 8 MT of CO2 by planting in Fiji or 4 MT by planting in New Zealand, how can we rationally or morally opt for the latter?

Our leaders must always remember that the aim is to accelerate global peaking.

**Carbon leakage**

Because the common aim is to reduce global emissions, it has long been recognised that nothing is to be gained from merely moving an industrial plant, or even a whole industrial sector from one location to another.

This already finds expression in the Climate Change Response Act in the allocations of NZUs made to Energy Intensive Trade Exposed industries (EITEs). “Global peaking” is not brought forward by forcing the commodity products currently supplied by NZ Aluminium Smelters, or Methanex or NZ Steel to be instead supplied from some other country.

Precisely the same argument applies to food commodities produced for world trade, such as meat, dairy products, horticulture or fish. Except in these cases there is the additional factor raised by the recital of the Paris Agreement (page 1) that:

“Recognizes the fundamental priority of safeguarding food security and ending hunger”.

The New Zealand government pursued “world leadership” in banning future oil & gas exploration within our EEZ. That decision was widely perceived to merely relocate future hydrocarbon production from an efficient location to less-efficient locations which (at considerable cost) would defer rather than bring forward “global peaking” of emissions.

The government justified its decision by reference to the “domestic economic transition” phrase criticized above. It is fair to say that this tortuous explanation cut little ice with opposition political parties and is unlikely to form part of any future multi-party consensus.

**Outsourcing**

During the 20-year period 1990-2010, the UK economy built upon its service sectors while allowing its goods-producing sectors to wane and largely disappear. Although there has been an increase in its consumption, the products which were formerly made domestically are now manufactured in China. The result has been a sharp reduction in UK emissions, which has consequently allowed its politicians to claim the title of “world leaders” in fighting climate change.

The outsourcing of whole industrial sectors from Europe to Asia has made no positive contribution whatever to the international community's aim of bringing forward “global peaking of greenhouse gas emissions”. In reality, the impact on the global target would have been quite deleterious as the energy intensity of UK plants was far in advance of that of China.

This is a sad example of form being preferred over substance and should be an enduring lesson for New Zealand. Territoriality or nationalism has no place in the team effort to impede the projected increase in the global average temperature.
Immigration
Similarly, people’s decisions regarding their country of residence should have no bearing on climate policy decisions that focus on global emissions. Similarly, a country that relies upon earnings from inbound tourism has an automatic disadvantage. This self-evident observation highlights the folly of fixing carbon targets or budgets based on a particular geographical area.

It is wrong in principle for immigration policy to be driven or influenced by climate policy, and only occurs if the focus is distracted from achieving an early “global peak”. All New Zealand’s targets and budgets should be calculated on a per-capita basis.

Bang for buck
There are endless ways to expend money and other resources in the cause of reducing global emissions, but some methods are clearly more cost-effective than others. Given limited resources, the paramount concern of New Zealand’s political leaders should be to maximize the CO2 reduction actually achieved for each dollar of cost\textsuperscript{65} incurred.

This objective can only be met if both the costs and results of competing methods are accurately measured. This kind of national cost-benefit analysis is well understood and should be regularly applied and updated by the Climate Commission proposed in the Bill. The Commission will quickly establish where comparative advantage lies and lean against any sub-optimal methods being included in emission reduction plans prepared under Clause 5ZD to 5ZF of the Bill.

Investments that produce inadequate returns should be eschewed in any endeavor. The opportunity costs are particularly high in climate change policy, where the available resources are effectively rationed by the limits of the community’s appetite for economic pain (ambition). Waste and inefficiency can not and should not be tolerated.

Yardsticks
At any time, the market price of an NZU under the ETS provides one benchmark of the actual cost of suppressing one tonne of CO2. But that market is distorted by expectations of inventory manipulation in consequence of policy changes and this artificiality will be further heightened by future emissions reduction plans.

Another benchmark is provided by private sector offset schemes such as the operated by Air New Zealand, which retails tonnages that are supervised and plausibly certified by . Businesses and the public have confidence in such schemes because they accept that the airline has incentives to maximise offsets at minimum cost and to select a reliable provider. Climate Care’s current wholesale cost is a readily available yardstick to compare the relative efficiency of any other proposal.

The new Commission should be requested to identify and publish an achievable yardstick dollar cost per tonne of CO2, whether domestic or global. This will offer considerable assistance to thousands of public and private sector enterprises which are seeking to reduce their carbon footprints. It is in nobody’s interest for a business to invest an amount well above the going rate when a much less resource-intensive solution is available.

\textsuperscript{65} Where “cost” includes either economic loss or accounting spend
Conclusion
There should be an all-party understanding, enshrined in the Bill, that all national climate change mitigation activity should be abide by a single guiding principle – achieving or exceeding our international obligations at the least possible cost.
The Climate Scare Could Be Gone By 2030

The New Zealand Government’s published modelling for its Carbon Zero Bill estimates a wealth loss of $200-300 billion over 30+ years of ‘blood toil tears and sweat’ to increase New Zealand’s 2050 net emissions reduction target from 50% to 100%.

The NZIER report is at pains to say that its modelling “should not be seen as a cost-benefit analysis”, nor a prediction of what will happen in future. It is merely the calculated outcome of certain assumptions – key ones being (a) there will be no exogenous technological change and (b) the following things would happen as “business as usual” (BAU) without policy changes:

- electric vehicles will reach 65% of the fleet by 2050;
- a methane vaccine will be available from 2030;
- unidentified innovations will deliver a 50% reduction in emissions by 2050;
- a 140% increase in afforested land;
- the ‘rest of the world’ will take strong action on climate

These massive predicted losses are the result of increased energy taxes or other deliberate Government interventions in the economy. This results from the assumption that the desired emissions reductions will not flow naturally from advances in technology or constant improvements/innovations in the supply or usage of energy.

The Technology Assumption

The assumption of 30 years of stationary technology is obvious nonsense. One need only to look back to the pre-internet era of 1990 to know that the entire world can and will change drastically from one decade to the next.

There will be new ways to produce and consume energy and they will become more and more efficient. There will be a range of options for personal transport and goods distribution. A recent article in The Australian points to the 20th century precedent of the Green Revolution:

> “Through practical innovation — irrigation, fertiliser, pesticides and plant breeding — the Green Revolution increased world grain production by an astonishing 250 per cent between 1950 and 1984, raising the calorie intake of the world’s poorest people and reducing the incidence of serious famines. Instead of tinkering around the edges, innovation tackled the problem head-on. Instead of asking people to do less with less, innovation offered the ability to produce more with less.”

While 99% of the carbon-reducing innovations will be patented in ‘the rest of the world’, New Zealand can also play a role by deliberately being an ‘early adopter’. Not by picking winners, but by ensuring that all the myriads of roadblocks and red tape (such as the RMA) are rapidly overcome or circumvented.

Generation IV reactors

The first breakthrough will likely be the full commercialisation in China of a next-generation nuclear energy system, with electricity outputs costing approximately UD$30 per MWH – less than the cost of any other baseload system, including new coal-fired plants. This is widely expected to occur in less than 10 years (see Annexe below) and thereafter to ride down the price-volume curve.

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66 ie without any change in existing 2018 policies. While the “innovations” are expected to be very expensive, these costs are unknown and therefore omitted. Who pays is also omitted.
Even before the rollout of Generation IV energy systems, China’s version of the Generation III EPR system has reduced capital costs by about half over the past decade. Developers now say that a $20 carbon tax would be sufficient to enable new Generation III reactors to compete against coal.

Nuclear (Gen III) is already the preferred new power source in those countries that account for 100% of the global growth in baseload energy demand – China, India, S Korea, Iran and Saudi Arabia. Once Gen III reactors are available, all countries will have strong economic incentives to repurpose the sites of existing coal plants and substitute nuclear reactors.

The opposition of the Green lobby has forestalled new nuclear plants in the USA and much of the EU since the Three Mile Island incident of 1979, and this resistance was re-energised by the 2011 Fukushima disaster. However, many Green movement leaders have reversed their stance and now consider nuclear energy to be the solution rather than the problem. These converts include such notables as James Hansen, ‘the father of global warming’, who pointed out (before the Paris Agreement):

“A build rate of 61 new reactors [Gen III] per year could entirely replace current fossil fuel electricity generation by 2050. Accounting for increased global electricity demand driven by population growth and development in poorer countries, which would add another 54 reactors per year, this makes a total requirement of 115 reactors per year to 2050 to entirely decarbonise the global electricity system in this illustrative scenario. We know that this is technically achievable because France and Sweden were able to ramp up nuclear power to high levels in just 15-20 years.”

**Major Emitters**

The five countries most heavily engaged in the new nuclear race produced of the world’s long-term gases in 2017.

<table>
<thead>
<tr>
<th>Country</th>
<th>% Global CO2</th>
<th>GtCo2</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>29.34</td>
<td>10.9</td>
</tr>
<tr>
<td>USA</td>
<td>13.77</td>
<td>5.1</td>
</tr>
<tr>
<td>EU</td>
<td>9.57</td>
<td>3.5</td>
</tr>
<tr>
<td>India</td>
<td>6.62</td>
<td>2.5</td>
</tr>
<tr>
<td>Russia</td>
<td>4.76</td>
<td>1.8</td>
</tr>
</tbody>
</table>

64.06% 23.8

By 2030, China is expected to have increased its 2010 emission levels by 50-100%, while the International Energy Agency predicts that emissions in India will treble over the 2010-30 period. These two alone will comprise two-thirds of the global total within a decade, so the five major nuclear competitors will likely exceed 80% of global CO2 emissions by the time Gen IV nuclear begins to make its impact.

**How will this affect the Paris Agreement?**

As soon as it becomes apparent that the “nuclear era” is replacing the “fossil fuel era” for economic (rather than political) reasons, the Paris Agreement objective of limiting anthropogenic global warming to 2°C since pre-industrial times (1.2°C since 1995) will have been met.

The IPCC’s projections of future warming are based on four mutually-incompatible scenarios, or “representative concentration pathways”, regarding future emissions of CO2. The UN has no
opinion on the relative likelihood of any scenario, which is outside the realm of the physical science, and leaves this pick to its member governments.

The expectation that the 2°C ceiling will be breached by 2050 is based on the worst case, known as RCP8.5, which anticipates a massive increase in both global population and the carbon-intensity (i.e., coal-use) of world energy production. This apocalyptic vision dominates the grossly exaggerated claims most favored by activist groups and all worst case possibilities, however unlikely, invariably dominate the media treatment of climate change.

The best case, called RCP2.6, assumes that the carbon-intensity of energy falls away dramatically in the second half of the 21st century, ensuring that the 2°C ceiling is never reached. Under this very likely scenario, human-caused global warming never becomes “dangerous”.

Projected change in global mean surface air temperature for the mid and late 21st century relative to the reference period of 1986-2005

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Mean 2046-2065</th>
<th>Mean 2081-2100</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCP2.6</td>
<td>1.0°C</td>
<td>1.0°C</td>
</tr>
<tr>
<td>RCP4.5</td>
<td>1.4°C</td>
<td>1.8°C</td>
</tr>
<tr>
<td>RCP6.0</td>
<td>1.3°C</td>
<td>2.2°C</td>
</tr>
<tr>
<td>RCP8.5</td>
<td>2.0°C</td>
<td>3.7°C</td>
</tr>
</tbody>
</table>

Demand side forecasts

The advance of nuclear technologies will address the supply side of the energy economy, augmenting the success of other market-driven improved-efficiency sources.67

The pace of emissions growth has already eased sharply from its peak in the early years of this century. Carbon intensity (CO2 per energy unit) is already decreasing in all sectors, having fallen 20% over the 10 years from 2006 to 2016 (from 60kg to 48kg per MMBtu). If maintained, that BAU improvement rate of 2% per annum will itself see emissions drop by one-third by 2030. On the demand side, energy intensity (energy use per unit of GDP) has been improving globally since 1990 with its decline averaging 1.5% per annum since 2001. This constant efficiency improvement is simply driven by the market and is not an outcome of climate policies.68

McKinsey’s April 2019 report: “The decoupling of GDP and energy growth,” forecasts that aggregate global energy demand will plateau in 2030 and thereafter begin to decline. This is a far cry from the forecast exponential demand growth which underpinned climate anxiety at the time of the 2009 Copenhagen Conference. The McKinsey prediction is wholly incompatible with the scenarios that would drive either RCP8.5 or RCP6.0.

67 eg + battery storage in desert areas

68 In the USA, which has longer records, energy intensity has declined steadily since its peak in 1950.
A similar prediction, backed by data, is made by Andrew McAfee’s well-regarded book “More from less” which follows on from Julian Simon and challenges the meme that humans are over-using or straining the earth’s resources.

It is already widely accepted that RCP8.5, the ‘apocalypse scenario’, is extremely unlikely and may even be impossible. It cannot be long before policymakers around the world conclude that RCP2.6 is the only likely pathway, whereupon the perceived urgency for mitigation action will surely dissipate overnight. Schoolchildren can stop marching. The Paris Agreement will become redundant. The climate scare will be over.

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Annexe: Status of Advanced Nuclear Technologies

R&D co-operation between the G20 countries in the Generation IV Forum (GIF) led to the publication of a Technology Roadmap Update as long ago as January 2014 which selected all of which offer “significant advances in sustainability, safety and reliability, economics, proliferation resistance and physical protection.” They range from small modular reactors ( ) to nation-scale multi-gigawatt facilities, all providing baseload power.

The UN’s International Atomic Energy Agency (IAEA) says there are currently four SMRs in advanced stages of construction in Argentina, China and Russia and estimates the global market at $150 billion per year by 2040. Canada describes SMRs as the “ ” and expects to have its first demonstration plant in operation by 2026.

China already has 46 uranium-powered reactors producing 42 GWh per annum, with 11 more under construction and 51 planned. Since 2015, the Chinese Government has deferred construction of Generation IV plants pending completion of the long-delayed Generation III plants which were being built in partnership with USA ( ) and France ( ) respectively. Both came on line late last year and four demonstration plants for China’s own Gen III design are . China hopes to build 30 as part of its “Belt and Road” initiative, earning about $145 billion by 2030.

China is also moving fast on its Linglong One 100 MW SMR with its first use to generate heat for a residential district, replacing coal-fired boilers. A thorium-powered pilot plant cooled by molten salt may be completed next year and the technology is expected to be fully commercialised .

Canada has 20 uranium-based nuclear reactors producing 45 GW of electricity already in operation and has another six under construction, 17 planned, and 40 proposed. It claims to be “leading the pack” on the use of thorium.

Scale in Asia is already driving down the cost of Gen III reactors and capital costs are only about half of what they were a decade ago. Industry groups claim Gen III would be made viable in Australia by a carbon price of .

The USA has been kept out of the race for decades by its set-in-cement atomic regulatory morass. These handcuffs were finally demolished by the Nuclear Energy Innovation and Modernisation Act which became law and the Nuclear Energy Leadership Act which is now before both
Houses with bi-partisan support. The US Nuclear Regulatory Commission has developed for “the next nuclear renaissance”.

US current policy is to collaborate with China and Russia\textsuperscript{69} and have fully commercial Gen IV plants in operation by 2030. Its ThorCon technology aims to produce CO2-free electricity cheaper than coal.

There are 126 reactors in 14 EU Member States, providing 12% of the bloc’s overall generating capacity. The European Sustainable Nuclear Industrial Initiative is funding three Generation IV reactor systems, one of which is a gas-cooled fast reactor, called Allegro, 100 MW(t), which will be built in an eastern European country with construction expected to begin in 2019.

\textsuperscript{69} A full-scale ThorCon prototype, a fission reactor with a liquid molten salt fuel containing thorium+uranium, should be built and operating within four years.
Resilience And Adaptation

It is clearly sensible to constantly improve resilience to weather extremes in all vulnerable areas throughout New Zealand. Such a policy will allow least-regrets decisions which will be of positive value whether or not climate-related fears are fully realized.

Facilitating adaptation to predicted gradual changes in future regional temperature and precipitation rates is less appealing. It is difficult and unrewarding to try to adapt the behaviours of whole communities to conditions which have not yet occurred – if only because such altered behaviors will be contra-indicated by prevailing conditions\textsuperscript{70}.

The challenge will be to maintain appropriate proportionality to other needs and to align priorities and timetabling with a rationally-quantified long-term remedial budget.

Forecasting the future

The gold standard of climate science is provided by the IPPCC which has clearly warned\textsuperscript{71} that:

"In climate research and modelling, we should recognise that we are dealing with a coupled nonlinear chaotic system, and therefore that the long-term prediction of future climate states is not possible."

Until 2013, the IPCC relied upon the art of \textsuperscript{71}to project a limitless number of possible future temperature outcomes based on its Special Report on Emissions Scenarios 2000 (SRES). Scenario planning was pioneered by Royal Dutch Shell following the 1973 oil shock. The central idea is to avoid betting all on a single forecast and instead to test future projects against a set of plausible scenarios.

Shell's planning guru\textsuperscript{72} likened dealing with the future to shooting the rapids. You know the general direction of travel, but not the exact path, and the trick is to be able to respond quickly.

The numerous scenarios of SRES were later superseded by four (RCPs) in 2014, on the basis that the IPCC had no expertise in the art of predicting future emission levels and would therefore confine itself to modelling the effects of just four hypothetical and internally inconsistent levels of CO2-e atmospheric concentrations.

The IPCC is now agnostic as to future emission levels. It is over to individual governments and others to decide which of the RCP’s seems most probable to them (based on the KAYA identity and other forecasting tools). Once one is selected then the others must be set aside, as the four pathways are mutually exclusive.

Analysts should never forget that all IPCC future projections are modelled on the basis of four widely different assumptions about future events (only one of which can be correct) and that the IPCC itself has no view as to which is ‘most likely’.

\textsuperscript{70} eg People will not want to wear less clothing (or instal air conditioning) while peak temperatures are low.

\textsuperscript{71} In AR4 (2007), WG1. See also here.

\textsuperscript{72} Pierre Wack. See The Economist 6.7.2019 page 12
The first task of the new Commission, in preparing a National Climate Change Risk Assessment under Clause 5ZN of the proposed Part 1C of the Act, will be to assign probabilities to the four RCPs, as objectively as possible, and to recommend which of them should become standard for New Zealand planning purposes.

**Projecting the past**
Although previous experience is no guarantee of future performance, it does provide the best available baseline data.

The climate-change-related risk that has received the most media coverage is the possible acceleration of the historic rate of local sea level rise (LSLR). Over the past 100 years, the average LSLR rate detected by tide gauges in the South-West Pacific has been about 1.5 centimetres per decade, which has caused no known difficulties or expense. The concern is that climate change may cause this rate to accelerate in future.

The IPCC makes no attempt to measure LSLRs anywhere, but is concerned that any temperature-driven acceleration in the rate of eustatic sea level rise (ESLR) will eventually be mirrored in the global average rate of LSLRs. If so, while the effects will vary greatly over time and space, acceleration of the ESLR will increase the risk of acceleration of all NZLRs by some unknown amount.

are that ESLR will range from 24cm to 30cm, depending on the chosen RCP. Even if the highest of those were fully reflected in the LSLR’s around New Zealand’s coastline (which is unlikely based on past experience) very few structures or infrastructural links would be threatened.

It will become an early task of the Commission to quantify the risk of accelerated LSLR at vulnerable points of the New Zealand coastline. However, they will know in advance that the greater risk lies in our seismic history. Leading oceanographer Willem DeLange has shown in that the future sea level in most New Zealand ports is twice as likely to be driven by land uplift/subsidence than by any changes in GMST. He says-

“The Kaikoura event caused a change of about 11 meters. We can expect at least one Mw 8 per century, and smaller quakes that displace the coast tend to occur nearly every year.”

In locations where Business As Usual (BAU) projections of retreating tide levels are offset by the risk-weighted estimate of climate-related acceleration of LSLR, no action need to be taken. Where BAU projections indicate LSLR risks, and they are materially enhanced by expected acceleration (if any) that coastal are may be noted as ‘vulnerable’. The starting point, however, must be a projection of past trends.

Similar issues arise in relation to other major climate-related issues such as the size of future stormwater drains to cope with flooding or irrigation water consents to deal with drought. The BAU trajectory must first be estimated by the forward projection of existing trends and then the risk enhancement from future climate change can be overlaid on that curve – and quantified in engineering and dollar metrics.

**Risk horizon**

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73 This should be a Treasury-led task, involving the collection and analysis of much international data.
Forecasts by Global Climate Models (GCMs) of the future weather effects of an increase in GMST (itself highly uncertain) is replete with caveats, large error bars and highly tentative assumptions – like most other weather forecasts. The uncertainties are very much larger in regional or local modelling based on the downscaling of the results from GCMs.

Generally, all this uncertainty increases sharply as the planning horizon increases.

Worldwide, there is a growing consensus amongst civil engineers that the most helpful climate-related information for least-regrets infrastructure design would be a transparent assessment, with probability statistics, of the ‘most likely’ effects of local climate change over a 20-25 year planning horizon. This relatively short horizon is because:

• although some of their work involves infrastructure with a 40-year+ life, much of it is expected to become either technologically or structurally obsolete over a shorter period;

• capital sanctions for major work must invariably be accompanied by net-present-value (NPV) calculations based on the discounted value of future benefits. Even the lowest discount rates tend to reduce to near-zero any value predicted to accrue after about 15 years;

• most capital works require extensive maintenance/renewal after about 15-20 years. If new knowledge reveals that the original design seems insufficiently robust or protected, the cost of strengthening (or even replacing) at that future stage is relatively modest – compared to the immediate cost of a gold-plated design;

• forecasts of actual climate-related local conditions 25+ years in the future are little better than chimpanzees throwing darts. The range of actuarial assessments for insurance purposes will be unlimited, as will opinions amongst ratepayers and their representatives.

• firm and transparent baselines for relevant weather conditions will allow subtle changes to be closely monitored year-by-year. Five-year milestone assessments will allow audits of the accuracy of the original estimates and whether ‘uncertainty’ risks need to be adjusted – or, indeed, whether those estimates should be discarded.

It is submitted that the first National Risk Assessment Report should be based on a 20-year time horizon. This will empower priority action on the country’s most urgent vulnerabilities, whilst further data is gathered on less obvious at-risk structures or ecologies.

“Worst case” scenarios

A serious error – apparently promulgated by many local authorities – is the view that risk management and ‘least regrets’ decisions require an assumption that all worst case scenarios will occur.

This is plain nonsense. All cases must be risk-adjusted and the worst possible future situation that an engineer can imagine will ordinarily carry such a low probability percentage that it will fall out of all contention.

The alternative is that the first ‘Rolls Royce’ solution will cost the Council so much money that no further remedial action on any other front will even be bankable.
Most climate change risks have a “long tail”. For example, while there is a 90% chance that the 2100 GMST will fall between 1.5°C and 4.5°C, that, of course, leaves a 10% chance that it will be even higher. On the other hand, 10% probabilities bring us into a realm where the overdue next glaciation might begin, or the world cools rather than warms. It is impossible to base policy and spending decisions on such ‘outsider’ speculations, if only because there is no end to them.

If probabilities cannot be confidently assessed, then more information is required before any consequential decision can be made. When dealing with ‘other people’s money’, second opinions should be sought and rigorously analysed. The meaningless words “could” and “might” should be banned from all engineering reports and replaced by probability statistics.

**National Risk Assessment**

The first task in any Risk Assessment will be to consult with regional and local authorities regarding the climate change risks they have already identified and to publish a draft ‘national list’ of categories and locations, with tentative priorities (say in five categories) based on the following:

- all available and relevant historical data, set out in accessible tables;
- 20-year projections of historic trends (ie business-as-usual (BAU) expectations);
- expected relevant changes (weather, tide limits, etc) consequent upon the estimated future increase\(^{74}\) in GMST;
- probability-weighted quantification of the enhanced risks consequent upon those identified changes;
- a first-cut risk-weighted estimate of the value of human health and welfare, critical infrastructure, or animal habitats, put at risk;
- 5-year ‘milestones’ of the expected climate-related changes. This will coincide with the statutory timetable for the issue of replacement assessment reports;
- the Assessment should make evident “the measures and indicators that will enable regular monitoring of and reporting on” both risks and remedies

The assessment report should also allocate the risks of Category 1 vulnerabilities (those described in s 5ZQ(2)(d) as “the most significant risks”) as between BAU and climate-related causes. On a case-by-case basis the government may feel that remediation of the latter should be funded at national rather than local level.

Further, once all these data and opinions are officially estimated, consideration might be given to the instigation of insurance cover comparable to that now offered by EQCover for private properties at risk.

**2020 Assessment**

Clause 5ZP of the Bill charges the Minister with preparing the first National Risk Assessment Report “no later than 1 year after the commencement of this Part”.

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\(^{74}\) As published by the IPCC (AR6) with selected RCP. The regional or local effects of that GMST rise will need to be assessed (with statistical confidence intervals) by NIWA's computer models.
Section 2 provides that the Act shall come into force on the day after the date on which it receives the Royal assent. There is no provision for different parts to come into effect on different dates. The government has indicated its intention that the Bill will be passed through all its stages by November 2019. All this suggests that the Minister will be legally obligated to table this first report during a period extremely close to the 2020 election.

This timing would be very unfortunate in legislation that is hoped to be enduring and multi-partisan. The first report might well be politically electrifying, particularly if it includes overtones of such possibilities as detracting from the property rights of coastal landowners.

Further, it is submitted that the preparation of all risk assessments should rest with the new Commission – as all the publicity surrounding the Bill has suggested. It is wrong in principle for this very consequential report to be politically determined, without public consultation and without any prior notice to parties affected. It will, at a stroke, remove all the existing rights of affected parties to challenge political or official opinions under the Resource Management Act.

The assessment deals with highly technical, data-driven issues and ought obviously to be determined by painstaking analysis rather than by political impulse.

It is, of course, possible that the Minister might, almost immediately after the risk assessment, table his first National Adaptation Plan as well.

The section defers for five years a leading raison d’être for legislation to establish a Climate Commission. It should be excised from the Bill and replaced by a timetable that calls for the Commission to publish its first National Climate Change Risk Assessment within three years of the enactment of the Bill.

National Adaptation Plans
In practice, the Commission’s consideration in a NCCRA of the steps required under Clause 5ZMP for “the most serious risks” will no doubt interact with the options available for Clause 5ZQ(2)(d) of the Minister’s Adaptation Plan.

In other respects, the provisions of 5ZQ(2) do not appear to respond to the NCCRA in any way at all. Although the introduction to the section provides that the Plan will respond to the Risk Assessment, the operative provision then gives the Minister carte blanche to include any (undefined) “Government objective” for “adapting to climate change effects”, and any “Government proposals” to meet those objectives – no matter how unrelated to the risks identified by the Commission.

This gives rise to the concern that the National Adaptation Plan might readily be hijacked for party political objectives such as the “economic transformation” so frequently mentioned in the Minister’s speeches.

The inclusion of Clauses 5ZQ(3) and 5ZQ(5), endowing the Minister with an unqualified free rein, do little to allay these concerns. Unless good reason can be shown, these two provisions should be excluded from the Bill.
Clause 5ZQ(2) should be entirely redrafted to ensure that the Adaptation Plan will be, within reasonable bounds, limited to its purpose of responding to the issues raise by the NCCRA.

Clause 5B of the Bill provides that the purposes of the Commission are:

“to provide independent, expert advice to the Government on … adapting to the effects of climate change.”

It is surprising, then, that the Commission has no role in advising the Government on its National Adaptation Plan. The Plan appears in the “functions” provision, Clause 5J, only in relation to implementation of the Plan. There is no equivalent in Part 1C of the advisory functions vested by Clause 5ZE in relation to Emission Reduction Plans. It appears that the intention of the draftsman was to ring-fence the Adaptation Plan so as to exclude the Commission, and reserve the Plan to political personnel alone.

In my submission the intention evidenced by the draft Bill is misguided. The Adaptation Plan will no doubt deal with many sensitive issues, many of which will be highly political. But the apparent purpose of this Bill is to bring in evidence-based policies and independent advisers whose influence should serve to reduce political temperatures and facilitate rational and consistent decision-making regardless of the colour of the Government of the day.
Annexe to Submission – Background

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Educated at Sacred Heart College Auckland, Auckland University, Victoria University of Wellington, Harvard Business School.

Employment History:
Principal in Wellington law firms 1964-76.
Member of Parliament for Kapiti 1975-81.
CEO, Wattie International Ltd 1982-89.
CEO, McAlpine Refrigeration Ltd 1989-2000
Law practice 2001–

Honours:

Public sector appointments held (previous):

Chairman:
Parliamentary Committee for Statutes Revision 1978-81
Parliamentary Committee on Misuse of Drugs 1978
Parliamentary Committee on Human Rights Commission Bill 1977-78;
New Zealand Gas Council 1979-81
Waitemata Electric Power Board 1990-94
Leader – NZ Gas Mission to UK 1980

Director
NZ Broadcasting Corporation 1969-72
Wellington Free Ambulance Board 1970-73
Wellington Hospital Board 1974-77
Wellington Savings Bank 1976-81
Petrocorp Exploration Co of NZ Ltd 1982-86
Open Polytech of New Zealand 1999-2003
Manukau Institute of Technology Inc 2003-11

Private Sector Board appointments held (previous):

Chairman/President:
Power New Zealand Ltd 1992-97
Electricity Supply Association of NZ
NZ Manufacturers Federation Inc1988-91
Buy New Zealand Made Ltd 1989-95
Pacific Energy Ltd 1992-97
Employers and Manufacturers Association (Northern) 1999-2001
Business New Zealand 2001- 04 (Vice President)

Director
Electricity Market Co Ltd 1994-97
Waitaki International Ltd 1985-90
Advanced Foods of NZ Ltd 1985-90
Hawkes Bay Farmers Meat Co Ltd 1986-90
Protech Engineering Ltd 1986-90
Supercool Industries Ltd 1986-99
Martha Hill Gold Mine JV 1987-90
Allflex Holdings Ltd 1988-89
Export Institute of NZ Inc 1984-87
Australia-New Zealand Business Council Inc 1984-89
Japan-New Zealand Business Council Inc 1988-92
NZ Employers Federation Inc 1997-2001
NZ Manufacturers Federation Inc 1997-2001
NZ Business and Industry Advisory Council Inc

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