Individual submission – Liz Springford

NZ Productivity Commission's draft Low Emissions Economy report (27 April 2018)

1. Thank you for starting to map hope

Thank you everyone for the enormous effort in creating this 500+ page map to New Zealand's net zero emissions future – this is a historic landmark report. Please read my submission feedback in context of this opening statement. For brevity, this submission focuses on changes to the draft report, rather than listing everything supported, or indeed applauded.

2. Summary

Adequate NZ climate ambition now means:

- NZ's emissions quickly peaking (preferably within months to contribute to 2020 global peak)
- rapid downwards trajectory of domestic emissions (especially long-lived gases)
- net zero all gas emissions target clearly legislated

Our transition to a resilient net zero economy must be fast, fair and firmly based in Tiriti o Waitangi (Treaty of Waitangi) partnership.

3. Terms of reference – NZ as a global leader

The original purpose of this inquiry was to identify options for how NZ could reduce its domestic greenhouse gases through a transition towards a lower emissions future, while at the same time, continuing to grow incomes and wellbeing. The adequacy of NZ's targets was off the table, including our commitment to halve emissions by 2050.

After the Productivity Commission completed the first round of consultation, the new Government has introduced the Zero Carbon Bill to consult with New Zealanders about setting **a more ambitious target for emissions reductions by 2050,** potentially doubling our speed from existing targets and legislation.

The 2015 Paris Agreement committed all countries to achieve net-zero emissions economies by the second half of this century. **All countries also committed to keep global warming well below 2'C, and pursue efforts to keep warming below 1.5'C**. The principle of "common, but differentiated responsibility and respective capabilities" continues, with NZ expected in various analyses to reduce emissions sharply. Global peaking of greenhouse gas emissions was agreed as "asap". These are the three crucial dimensions of "ambitious".

As the Minister for Climate Change advised the Commission, NZ is expected to take the lead on actions to reduce emissions and to transition to a zero net emissions economy sooner than others. He also said that considering the Government's intention to set a more ambitious target for 2050 is helpful. The Minister has encouraged this inquiry to **consider the full range of potential benefits and opportunities that might arise from NZ taking the global lead on reducing emissions.**

4. Foundation for fast, fair, Tiriti-based net zero NZ transition:

A. Truly Tiriti partnership

Transitioning to net zero New Zealand without real Te Tiriti o Waitangi (Treaty of Waitangi) partnership, has been described as "net zero colonisation" this century. Our changing climate and threatened natural resources have also been described as a symptom of NZ's colonisation.

Yes, clear legal direction that this zero-emissions transition is based in Tiriti partnership is essential. This includes specifying solid representation in governance structures, a well-resourced and influential Tiriti workstream within the Climate Commission, plus intentional funding and other resourcing outside of the Commission, to ensure there is real capacity for strong powerful Māori voices to drive NZ's transition – so Tiriti partnership is real and robust. Every dimension of NZ's net zero transition must be grounded in Tiriti partnership.

B. Defining "well-being" well

Work on what "well-being" means is strongly recommended. The terms of reference call for low emissions transition whilst "continuing to grow incomes and wellbeing". The urgency in reducing emissions for future wellbeing, means NZ needs **precision in measuring the agreed "well-being" that we need to protect and enhance**. We can't afford to rely on "GDP growth" as a proxy for wellbeing, nor any other similar proxies.

Arguably, "growing incomes" is a subset of growing overall wellbeing. Better definition is needed – average incomes is inadequate. From last year's election focus on poverty, narrowing NZ's widening wealth gap is likely to have strongest NZ support. Especially the financial situation of New Zealanders living on benefits or low wages, with this income made even less liveable by rising housing prices. New Zealanders appear to have mostly rejected the "trickle down, wait and watch all incomes rise" thinking of 1980s NZ reforms. Better well-being needs to be measurable and more immediate in impact.

NZ has already signed up to the UN Sustainable Development Goals. These goals help define "well-being" – throughout central and local government, iwi, businesses and communities. I understand the Treasury has already mapped alternatives to the "GDP growth" wellbeing proxy. GDP was never intended to be a measure of societal well-being, but was created as simply a measure of money flows, regardless of societal well-being impact. There is also already work in NZ on using Genuine Progress Indicators. Other models of well-being include Kate Raworth's 'Doughnut' as a 21st century lifebelt for the world, and wellbeing economics (Dalziel & Saunders 2015).

Defining "well-being" well means public consultation, as Tiriti partnership, and especially with New Zealanders whose well-being is already too compromised.

5. Changing contexts mean multi-dimensional modelling

Importantly, NZ is operating in an extremely changeable context. This demands multi-dimensional dynamic modelling, so that we can respond quickly and intelligently, to profound context changes.

Although there's much focus on targets, **the bottom line for NZ (and globally) is our global emissions budget**. Arguably **Figure 8.2** ***Remaining global carbon budget*** (based on global emissions continuing at current rates) is **the most important information** in the Productivity Commission's draft Report – especially the surprisingly low probabilities for limiting global warming to 1.5'C or 2'C.

We face an increasingly limited atmospheric capacity to absorb more climate-disrupting emissions. Being open and ready for changes in environmental, political and technological contexts is essential. This is a highly dynamic environment where our speed in reducing emissions is crucial.

A. Environmental change
(i) What the world does

Global commitments at Paris (***if*** implemented as promised) are widely agreed to add up to 3-4'C. In other words, half what's needed. Zero emissions globally by mid-century relies on global emissions peaking in 2020. That's within eighteen months or so. If the world continues to emit along the current business-as-usual trajectory, we run out of space to safely emit within years, not decades (as the report's Figure 8.2 shows). The logical consequence is suddenly global net zero emissions – decades ***ahead*** of schedule.

Similarly, because the bottom line is the global emissions budget, the global rate of emissions reduction will also ultimately determine when global net zero is wise. So this means NZ needs the information, capacity and political will, for fast fair Tiriti-based responses to changing conditions.

(ii) What we know
Probably the most critical information is where the tipping points and feedback loops lie for climate changes beyond human capacity to adapt –our changing climate and ocean conditions are new territory for our human world. Emerging science will also determine our speed and size of emissions reductions. We need capacity to keep completely up to date, translate into clear actions, and feed that information quickly throughout our economy for fast fair response.

B. Political and economic change
(i) What the world agrees to

What's measured? Currently, the world has agreed to measure production (not consumption) emissions, and excludes international travel – although global focus on travel emissions is growing.

As a small open economy, NZ is reliant on the world's food consumption preferences, plus overseas tourism, for export earnings. We would be wise to monitor how international focus on consumption and international transport emissions could impact our economy. By starting to identify viable responses, we can grow our economic resilience. We may also need to anticipate and plan for global trade responses – whether pushback against NZ climate action from the minority of international companies which emit the most, or from international trade sanctions to enforce emissions reductions.

What temperature limit? The world has also agreed to emissions trajectories based on "likely" (two-thirds) probabilities of limiting warming to 2'C, and efforts towards 1.5'C limit. There is considerable difference between the human and biodiversity impacts, plus tipping point risks of 1.5'C, versus 2'C. Small island states and other nations with highly populated low-lying land areas, have been pushing for 1.5'C. NZ's special relationship with Pacific islands and territories, suggests we may also support limiting warming to 1.5'C. Apart from international obligations to respect sovereign states and not take land, the scale of human displacement may be tenfold more than from Syria, and even more destabilizing globally. For global peace and climate cooperation, **1.5'C may emerge as the more important temperature limit.** In any case, NZ would be wise to both map and **strongly** pursue efforts to limit global warming to 1.5'C – which means reaching net zero a decade or so earlier.

What level of risk? The global emissions trajectory towards net zero is based on a two-thirds "likely" probability of limiting global warming to 2'C. The faster trajectory towards a perhaps 50% probability of limiting warming to 1.5'C, also gives an 85% probability of limiting warming to 2'C. Given what's at stake, there may be strong public preference for greater certainty than two-thirds likelihood of avoiding global warming above 2'C with climate changes beyond human capacity to adapt. Treatment of risk to human health and safety in other non-climate change settings, suggests strong public preference for much greater certainty – and therefore much faster tracking towards net zero much sooner.

(iii). How the world responds to changing climate and ocean impacts

Although the Productivity Commission's focus is on NZ's pathway to becoming a low emissions economy, increasing climate and ocean changes (already locked in over the next few decades) will impact this pathway. At local government level, councils are starting to consider climate impacts, talk about resilience, build seawalls, revise district plans. Local government focus appears to be mostly at a physical level.

However, the impacts of locked-in climate and ocean changes include:

- growing infrastructure repair and insurance costs (and increasingly uninsurable risks) locally
- challenging decisions about compensation for households and businesses affected by climate damages
- echoed by growing demands internationally for loss and damage compensation for countries least responsible but most affected
- destabilised world markets with less capacity to buy NZ exports, which in turn would reduce tax and rates revenues.

Potentially reduced tax and rate income (coupled with increasing demands on that income) makes a clear case for investing in NZ's necessary net zero infrastructure now. That's before locked-in climate and ocean changes push NZ into increasingly reactive spending.

C. Technological change

This is our "get-out-of-jail" card – the hope that technological breakthroughs will emerge that make our fast fair Tiriti-based transition to net zero much easier. Monitoring (and encouraging) new technology developments matters.

We need to create an environment which both:
(i) encourages the emergence of helpful new technology, *and*
(ii) **enables the rapid uptake of helpful new technology across our economy.**
This means well-funded research capacity, good communication with cutting edge operators, and sharing new discoveries within international communities (including "developing" countries).

This is also a strong argument for a clear fast trajectory towards net zero NZ – for business certainty which spurs the new technological directions we need.

A clear fast net zero trajectory now using existing technology, is also an important chance to grow our capacity to quickly disseminate new technology. (For example, in the farming sector, best practice suggests some farms can significantly cut emissions already, with win-wins in profitability, working conditions, animal health and land care. Actively encouraging best practice to quickly become standard practice, opens up learning about barriers and solutions for fast technology adoption.)

NZ has committed to actively supporting less developed countries develop along a low emissions pathway – critical for our global capacity to limit warming. This includes agricultural research where NZ has a strong presence, but also includes financing low emissions development and sharing our technological breakthroughs. NZ signed up to the UN Sustainable Development Goals back in September 2015 – we are part of the global movement to transform our world by 2030.

6. Consistent approach to health and safety risks

Balancing climate action priorities against other wellbeing priorities needs a clear decision-making framework, when these priorities conflict. Noting that there are many co-benefits where well-designed climate action can also ease many health and well-being challenges – win-wins.

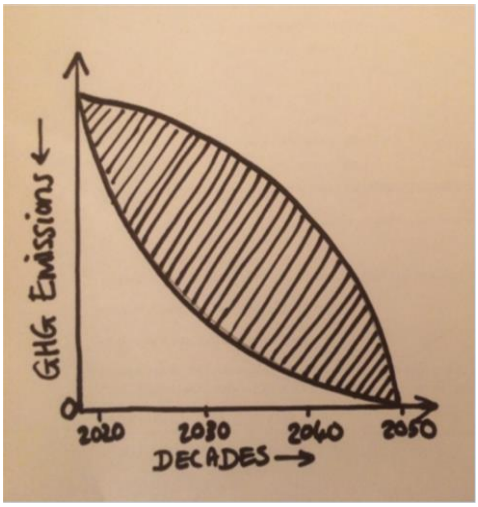
Currently, global emissions peaking by 2020, with the target of global carbon emissions at net zero by mid-century (and all emissions net-zero a decade or so later) gives the world just a **two-thirds chance** of limiting warming to 2'C. That's assuming we have global cooperation on fast movement now.

This calls for Ministry of Health and Treasury leadership for a consistent publicly-supported approach to pricing health and safety risks across NZ – especially for allocating government funding. Whether infrastructure design, medicine safety, hospital operations, air-flights or workplace practices, we tend to expect better safety odds than a two-thirds chance? Initial work suggests there's already discrepancy between Votes Transport and Health in valuing human life. Saving human lives appears to be valued 15-19 times more in the transport sector than in the health sector (NZ Medical Association 2017[1]). (As an example, a consistent approach to valuing health and safety risks, may help determine the answers to questions relating to cement standards.)

Early interventions such as schooling and childhood immunisation, intended to last a lifetime, also indicate the support and value that New Zealanders currently give to future quality of life. People who are below retirement age now, will experience climate changes several decades ahead, based on this year's emissions and following years. These are the even more extreme changes that we have the limited chance right now to slow and stabilise. Climate action now is relevant for most New Zealanders alive today – as well as for subsequent generations.

7. How fast can NZ transition?

In the short term, that is the next decade or so, speed seems wise. Can we turn our thinking around and ask how fast can we fairly transition? What could be put in place this year? Next year? We've been talking about climate changes for a generation now, how much more lead time for changes is really needed? What encourages cooperation in fairly sharing our atmospheric commons? The bottom line is volume of emissions and a fast start creates numerous advantages, as well as substantially less emissions.



The advantages of fast (fair and Tiriti-based) transition include:

- avoiding high-emissions stranded investments
- fairer, managed changes
- learning from doing
- encouraging new technology
- clear signal for businesses, households & communities
- substantially less emissions
- greater likelihood of reaching net zero in time

Figure: whether emissions reach zero rapidly or slowly strongly impacts total carbon budget (as total emissions, being area-under-the-curve)

[1] Supplementary information: Calculating the value of some transport sector (major strategic roading) versus some health sector (pharmaceutical) investments—a case study. http://www.nzma.org.nz/__data/assets/pdf_file/0005/77765/Baddock-supplementary-updated.pdf. Supplement to Metcalfe S, Gunasekara S, Baddock K, Clarke L, for the New Zealand Medical Association. Time for healthy investment. Editorial. N Z Med J. 2017;130(1464):7-10.

8. Pricing emissions at true cost – ETS rehabilitation, plus shadow pricing now

A: ETS rehabilitation

Agreement appears to be widespread that the ETS needs urgent rehabilitation to function as originally intended – that is, as a mechanism to reduce NZ's emissions at least cost and at the speed needed. The ETS must not be seen as a tax that gives permission to emit. The ETS must become a major mechanism to reduce emissions fast.

To be able to continue to use the ETS architecture (instead of further costly delay through establishing a carbon tax), the government must be able to demonstrate that the same (or more) revenue is being directed effectively towards ensuring that vulnerable communities are well able to transition towards net zero emissions.

This means real partnerships with already disadvantaged communities, and their representatives, to ensure urgent support is quickly put in place for a fair transition. New Zealanders are already concerned about how many of us live in relative poverty (especially children) and our high rates of preventable ill-health, suicide and imprisonment, which are racially biased. Affordable housing for all is urgent, including reversing the decline in home ownership. "Fairness" means both increased minimum wages (to be truly living wages as NZ's Arbitration Court used to set), so the basic human rights of good food, warm safe housing, access to quality education and healthcare, gender equality, safe neighbourhoods and workplaces, and ability to participate in community life, are in place for all of us (refer UN Sustainable Development Goals for 2030).

As well as adequate incomes, benefits, jobs and housing supply, low emissions infrastructure needs to be in place. So, for example, affordable, convenient, reliable and safe transport alternatives need to be clearly available, as private fossil-fuelled transport becomes increasingly expensive. Similarly, alternative job pathways need to be clearly ready and easy to access – as some high-emissions industries will decline or disappear, if the ETS is effective.

Putting fair transitions clearly in place, to me, is primarily about being a fair country, so NZ's disadvantaged communities and individuals are much better off than currently. But this also avoids the ETS and other regressive measures such as petrol taxes, being scaled back on regression grounds.

I believe we must have an all-gases, all sectors, all emitters ETS priced to push emissions down at the speed we urgently need. I think there are grounds to put in both price floors and ceilings, to avoid too much volatility and for short-term business certainty. But these floors and ceilings will need frequent updates to ensure we have a NZ emissions price that gets the fast changes we need. The ETS must be limited to the NZ market to ensure domestic change, at least over the next couple of decades. NZ is already expected to play our part in supporting low emissions development in lesser developed countries – so we can use that as a way of encouraging least-cost emissions reductions internationally.

B: Shadow pricing in all state sector and local government cost-benefit analysis from this 2018/2019 year

I strongly recommend using shadow pricing for emissions in all cost-benefit analysis across NZ state sector and influencing local government to do likewise – from 2018/19 onwards. There is limited experience already with shadow pricing, with congestion reduction valued at NZ$40 per tonne CO2-equivalent emissions, at the detailed design stage of roading projects[2]. I recommend that Treasury update the required shadow pricing within the next few months to an accurate level – based on international social cost of carbon literature. The longer we delay doing this, the more white elephant stranded high-emissions assets NZ will be stuck with, at considerable costs.

> **Case study:** *The recent "Let's Get Wellington Moving" (or not) joint project between NZTA, GWRC and WCC is a case study of the failure to apply adequate cost-benefit analysis that includes climate change and other health costs.*
>
> *In 2016, WCC agreed on a Low Carbon Plan 2016-2018 with city-wide targets for reduced emissions by 10% by 2020, 40% by 2030, and 80% by 2050. When Wellington's emissions were last measured a few years ago, these had dropped less than 2% from baseline. The Plan acknowledges that more than half of Wellington's emissions are from transport. GWRC has a Climate Strategy to reduce regional emissions, although no specific targets.*
>
> *Although both Councils' plan and strategy need updating to match NZ's new net zero trajectory by 2050, Wellington's emissions reductions targets were not included in the Let's Get Wellington Moving consultation. Instead, a vague "Clean and Green" principle to "improve environmental outcomes for Wellington city and the region" was amongst a dozen principles – in response to the first wave of public consultation.*
>
> *Four scenarios were presented for public consultation late last year. This was basically, one scenario in four sizes: Small, Medium, Large, and Extra-Large – ranging from "a little more active and public transport provision plus a little more roading", to "a lot of active and public transport provision plus a lot of roading". The capacity of improved active and public transport to decongest existing roading provision was ignored. Likewise, induced increases in private fossil fuelled vehicles by increasing roading provision were also ignored.*
>
> *Climate impact analysis was limited to noting under the "Clean and Green" principle that for each sized scenario there will be "No significant change to greenhouse gas emission at a regional level". Construction costs of each scenario were detailed for the public, but not the running costs – that is, the impact on Wellington's transport emissions contributing to the ongoing operational costs over the lifetime of the infrastructure.*
>
> *Another wave of public consultation appears to have sent a strong climate-protecting message. However, this case study indicates the urgency in introducing accurate up-to-date*

[2] NZTA Economic Evaluation Manual (EEM), effective from 1 January 2016 https://www.nzta.govt.nz/assets/resources/economic-evaluation-manual/economic-evaluation-manual/docs/eem-manual-2016.pdf Appendix A9.6,A9.7.

shadow pricing across the state sector and influencing local government to follow suit. Delay risks wasting taxes and rates, plus inheriting high-emissions white elephant infrastructure that limits our capacity to move towards net zero NZ fast enough.

Currently, I understand that the social cost of carbon is conservatively predicted to be NZ$88 per tonne by 2020, rising to NZ$176 by 2050[3]. These rising costs should be accurately applied over the lifetime of all proposals. Furthermore, discount rates should not privilege current generations above future generations.

As well as avoiding locking in high-emissions from white elephant infrastructure and optimising tax and rates expenditure, other advantages of rapid introduction and uptake of up-to-date shadow pricing across the state sector and local government include: (i) learning by doing: and (ii) influence across NZ, as one-third of NZ's workforce are employed by state sector or local government.

Government shadow pricing can also be more quickly updated in response to the likely rising social costs of emissions, than ETS prices, especially if these are protected by price floors and ceilings, to decrease volatility and increase business certainty. There will also be times when the current shadow price is the same as the prevailing ETS price.

9. Specific Questions

Note some of these questions appear quite limited in scope, and in places, are perhaps asking the wrong question, with a limited view of how much change is possible, or how trade-offs can be better made.

Chapter 6 – Investment

Q6.1 Yes, the investment policy of the NZ Venture Investment Fund should include low emissions investments. We need to ensure that almost every government agency and activity encourages much lower emissions.

Chapter 10 – Land use

Q10.1 Choosing the level for ETS obligations is a balance between clear direct signals for producer change, and not overly burdening small scale farmers, especially important innovators such as organic farmers, community supported agriculture and farms trialling new lower emissions crops. There may be a growing niche for software technology, farm advisers and farming cooperatives, to make administrative compliance easier.

Q10.2 Similarly, encouraging all carbon absorption (whether through soils, horticultural crops, manuka and kanuka coverage, NZ bush regeneration, or new forest plantings) is important. Developing software technology to make this administratively easy, is a priority. Earning emissions credit income can help grow our regional economies.

[3] Mid-range social costs of carbon in 2017 dollars. Source: Chapman R, Preval N, Howden-Chapman P. How economic analysis can contribute to understanding the links between housing and health. Int J Environ Res Public Health. 2017;14(9).pii:E996. http://www.mdpi.com/1660-4601/14/9/996/htm 2. Methods

Chapter 11 – Transport

Q11.1 Yes we should explicitly set a date for fossil fuel vehicle imports to stop. NZ could match other leading countries – or indeed move faster given our second-hand vehicles are quite old, with scrapping close to 20 years. I assume this will not be a problem under any of NZ's trade agreements – and if so, that will be a good test of the climate capacity of current trade agreements and identify which NZ needs to withdraw from.

Q11.2 Yes we do need to incentivise both heavy and light EV uptake with a feebate. This could be fiscally neutral by charging extra for importing fossil-fuelled heavy and light vehicles, and implemented from next year. See trade agreement comments above.

I would like to see feebates extended to E-bikes, push-bikes and other equipment for increasing active zero emissions transport. Feebates for EVs currently favour well-off households and businesses.

But there is much more to be done. We urgently need to move freight off trucks and onto coastal shipping and rail, including electrifying NZ's rail network. We need light rail urgently in place in Wellington, as well as Auckland. And given the longer distances, rural New Zealanders need to drive, we need fast EV uptake in rural and regional NZ. Almost every vehicle purchased by state sector agencies and local government from July 2018 must be an EV, unless range concerns indicate a hybrid is necessary. This will accelerate NZ's second-hand EV market.

Overall, trip avoidance and greater public and active transport growth is even more important. This includes affordable car share vehicles for hourly hire within minutes' walk of most urban-dwelling New Zealanders. Car share enables people to freely decide which mode is best for each trip, and reduces annual transport costs from thousands, to hundreds of dollars, per year. Each car share vehicle removes around ten privately owned vehicles – which is important for both decongesting roads, clearing space for rapid transit lanes, plus safe cycling and walking routes. Less need for car storage also helps encourage more compact cities. Car share is an essential component for growing active and public transport.[4,5]

Chapter 12 – Electricity

Q12.1 Personally, I think there should be extremely limited capacity to oppose wind farms under the RMA, because wind farms do not permanently damage an environment, so the National Policy Statement could support that. Hydroelectricity is more complicated as this may involve

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[4] Transportation Research Board of the National Academies of Science. Car-Sharing: where and how it succeeds. TCRP Report 108, 2005. http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_108.pdf
International Association of Public Transport (UITP) European moses project, 2005.
UITP Bremen Paper 2002 (guidelines for synergies between public transport and car-sharing)
http://www.communauto.com/images/BremenPAPER.pdf

[5] Overseas research indicates that car share has relied on partnership (either with local authorities or public transport operators) to get sufficient scale for the spiral of success – more cars means more visibility, which means more members and thus more cars, which in turn creates more confidence that a car will be available when wanted and leads to more members.
A 2009 catalogue showed carsharing services being available in over a thousand cities in many nations (http://ecoplan.org/carshare/general/cities.htm#latest); numbers are expected to be much higher now, where as of December 2012 there were an estimated 1.7 million car-sharing members in 27 countries (including so-called peer-to-peer services) (http://www.nytimes.com/2013/01/26/business/car-sharing-services-grow-and-expand-options.html?ref=technology&_r=1

significant damage to rivers and natural bush (as for example, Mokihinui). So, I would like to see the ability to oppose hydro to continue, if permanent and extensive damage is likely. Overall, I would like to see climate action (and avoiding climate damage) as an important criterion for RMA consent. West Coast coal mining applications under the RMA, with expensive detailed reports on remediating local environmental damage, yet completely ignoring climate damage as the elephant in the room, were frustrating.

Chapter 13 – Heat and industrial processes

Q13.1 I don't know whether cement standards need change – however I strongly recommend that NZ takes a more consistent approach to health and safety. Currently considering an emissions reduction trajectory that gives us a two-thirds chance of limiting global warming to a relatively risky 2'C appears inconsistent with demanding much higher health and safety certainty in building seismic strength, medicine, transport, and workplaces.

Q13.2 See answer to Q13.1 above.

Q13.4 This is a cement industry question. In the absence of frank industrial advice, the answer is lifting the emissions price till lower carbon cement is predominantly produced. However, another promising direction for NZ is increasing local timber in building construction – this may be a better solution which also builds our economic resilience and promotes forest growth as rotating carbon sinks.

Chapter 14 – Waste

Q14.1 Yes, the NZ ETS should cover wastewater plants – as part of the principle of all gases, all sectors, all emitters. If there are threats to human health and Tiriti water obligations, then mitigating policies and/or funding could be considered to offset adverse impacts of ETS coverage.

10. Recommendations

In brief, the recommendations

Chapter 1 – Emissions pricing

R4.1 Agree, see ETS section above.

Chapter 5 – Innovation

R5.1 All subsidies that support **any exploration**, and the ongoing production and use of fossil fuel, should **end immediately** - with that expenditure immediately **redirected** towards the fair transition of NZ's disadvantaged communities (for example, free public transport for community services card holders).

R5.2-R5.5 Yes to all, note **net-zero** emissions economy now.

Chapter 6 – Investment

R6.1-R6.4 Yes to all, note **net-zero** emissions economy.

Chapter 7 – Laws and institutions

R7.1-R7.3 & R7.5-R7.7 Yes to all, note **net-zero** emissions economy.

R7.4 – I strongly believe that the **Climate Commission must set the emissions budgets**, making strong efforts now to peak before 2020, reduce rapidly, and to play our fair part (as a historically responsible global citizen with capacity) to keep global warming under 1.5'C, and **absolutely*** under 2'C (*ie. much more than 2/3 certainty). The Commission's budgets will be split into long-lived and short-lived gases.

The government of the day is then able to set fiscal budgets, policies and regulations, to stay within the Commission's specified emissions budget. This means any government can be more ambitious in emissions reductions than the Commission's budget – and can choose the government's preferred political trade-offs within that emissions budget.

R7.8 & R7.9 – The Climate Commission has both an advisory role on mitigation and adaptation policies inter alia (including recommending ETS price settings, floors and ceilings), but also the statutory requirement to set emissions budgets at legislated intervals.

This is akin to the Reserve Bank's authority, and arguably even more profound in impact across NZ. As a nation, we simply can't afford global emissions to exceed 2'C temperature limit. End of story. The Parliamentary Commission for the Environment's experience indicates that the Commission advisory model does not provide the authority needed for our global climate emergency. Like the Reserve Bank model, placing emissions budget responsibility with the new Climate Commission, takes overall emissions reductions out of short-term political volatility.

R7.10 & R7.12 - Yes to both, note **net-zero** emissions economy.

R7.11 As discussed earlier in this submission, NZ's fast fair net zero transition needs to be Tiriti-based at every stage. Real partnership is essential to avoid recolonization. This includes the governance of the Commission, setting up a highly influential and well-resourced Māori unit within the Commission for Tiriti-based direction, and resourcing Tiriti-based climate action research and consultation amongst iwi and non-iwi affiliated Māori.

Chapter 8 – Short-lived and long-lived gases

R8.1 Yes, noting that the Commission will set the long-lived and short-lived gases budgets.

Chapter 10 – Land use

R10.1-R10.3 & R10.7-R10.8 Yes to all, note **net-zero** emissions economy.

R10.4 No, the agriculture sector has known for years, perhaps decades, that emissions are destabilising our climate – the same stable climate on which NZ agriculture depends for success. Continuing high emissions is an own goal for farming. The agricultural sector is already well-placed to significantly reduce emissions, with increased profitability, better working conditions,

land and water protection, and better animal welfare[6,7]. The agricultural sector needs strong signals to act – the biggest milk processing plant at Darfield set up recently to run on coal is why agriculture needs to be in the ETS now, without free units. However, the ETS may focus more on long-lived gases more than short-lived gases – although both need to reduce. Real ETS inclusion may include some continuation of tax-payer funded climate adaptation relief – that urban and rural New Zealanders are united in facing our climate emergency.

R10.5 – I understand there are issues with Overseer, which mean the government needs to urgently upgrade this tool.

R10.6 – Forestry needs to be urgently incentivised to grow, as indeed all carbon sinks. And at the same time, we need to rapidly reduce our domestic emissions, building the net zero emissions infrastructure now that we need to manage the years and decades ahead of us. Forestry should not delay domestic action at all. We need to act urgently in **both** areas – rapid emissions reductions and rapid growth in carbon sinks.

Chapter 11 – Transport

R11.1, R11.3 – yes.

R11.2 – Feebates must be extended to E-Bikes, pushbikes, scooters and other zero-emissions active transport equipment which are much more within reach of lower income households and businesses.

R11.4 – The Government must require all state sector agencies to purchase electric vehicles (unless there are very strong grounds not to –in exceptional cases, in which case substituting hybrid vehicles).

R11.5-R11.6 – Absolutely, see earlier recommendations on universal application of up-to-date shadow pricing in all cost-benefit analysis across the state sector and influencing local government (and change wording to net zero emissions economy). Especially refer to Let's Get Wellington Moving case study outlined earlier.

Chapter 12 – Electricity

R12.1-R12.4 – I strongly recommend a widespread review of the electricity sector, so that NZ has a sector which can make energy conservation and secure 100% renewable energy supply their top priorities. Domestic electricity consumers have been estimated to pay about double reasonable prices – and energy poverty is too big a reality in NZ. Simply encouraging consumers to switch providers has not reduced prices to the extent needed. NZ's electricity supply is too important for both our future economic resilience and fair fast net zero transition, to be left as is.

[6] Parliamentary Commissioner for the Environment. Growing for good: Intensive farming, sustainability and New Zealand's environment. Wellington: PCE, 2004. http://www.pce.parliament.nz/media/pdfs/growing-for-good.pdf.

[7] Dewes A, Death R, Day A. Getting ahead of the game: maximising profit and environmental protection on 21st century dairy farms. Proceedings of the Society of Sheep and Beef Veterinarians of the New Zealand Veterinary Association and Cervetec Conference 309, Jan 2015.

Chapter 13 – Heat and industrial processes

R13.1-R13.2 – Yes – net zero emissions economy.

R13.3-R13.4 – No, not yet, public discussion informed by good science, is needed before NZ can embrace new carbon capture technologies as safe and reliable, beyond current use of vegetation and soil as natural carbon sinks.

Chapter 14 – Waste

R14.1-R14.5 – Yes, urgent. For example, Wellington City Council has just agreed to increase landfill size, Kaikoura Council by contrast, was diverting 3/4 of waste a few years ago.

Chapter 15 – The built environment

R15.1-R15.3 – Yes, especially as NZ rushes to increase our housing supply. All new housing must be affordable to buy and rent – and affordable to live in as emissions prices increase. This means best-practice design legislated now, to ensure negligible energy demands to heat and cool housing. Similarly, with other new building. If passivhaus (passive houses) are possible in colder parts of Europe, then certainly NZ must have new housing that can keep comfortable temperatures throughout the seasons, especially as we get more extreme weather events and temperatures.

11. Personal postscript
Travelling towards net zero NZ...

Ko Liz Springford ahau, I am a many-generations Southlander whose pākehā forebears profited from Aotearoa's massive deforestation, and who farmed without the recent exponential rise in fertiliser and palm kernel feed. I saw the 1980s impact of the sudden removal of farming subsidies on my small rural hometown – including apprenticeship doors shut, and freezing works insecurity for whānau.

I began my advocacy and machinery of government States Services Commission decade, as a Social Impact Unit advisor, hoping to minimise the social impact of 1980s economic reforms. Continuing Wellington life, I am conscious that my household relies on public service employment – which in turn depends on a resilient NZ economy.

After completing a masters in public policy, I saw that Al Gore movie in 2006. I suddenly saw our changing climate as NZ's biggest social policy challenge; that climate protection is about us as people, our future and our well-being.

Our household made many changes, surprisingly life-giving, including selling our large family car, experimenting as a household with three children aged 9, 14 and 16, and without a car. We got fitter, had fun, got to know Wellington more intimately, and got interested in car share – cars for hourly hire! Quickly halving both our household and transport energy was fairly easy.

I soon realised that although personal experience was valuable learning, sizeable emissions reductions need to be at central and local government level, business and community, not just households – so that led to NGO and other action. With others in 2009, we started to map how New Zealand could reduce 1990-level emissions by 40% by 2020 – effectively halving 2009 emission levels within a decade. This became a vision for life in 2020: "The Age of Smart", published here.

The journey continues – last year I flew to Manila to see my grandchild born, my first overseas flight for a dozen years, as a mostly flightless Kiwi. Those flights were offset with Ekos Southland-based Forests for Health, but I know we cannot plant or protect enough trees to continue high-emissions living. That has prompted me to be mostly meat-less since returning from the Philippines. And I know that my grandchild's other grandmother could have died in Typhoon Haiyan, one of the strongest tropical cyclones ever recorded, devastating her Wellington-sized city of Tacloban in 2013.

I want to watch my grandchild grow up, but I also know what I do, what I support politically and in my community, over this decade ahead, determines how much hope she and my adult children have. For us baby-boomers, what we do this decade also determines whether the social contract of caring between generations continues – remembering we in turn will become increasingly dependent on those younger than us.

So for me, the pathway to net zero emissions began a dozen years ago, later than some, earlier than others. I believe we depend on each other, learn from our experiences and from others. This is a transition that needs to be fast, fair and firmly based in the Tiriti partnership that began this nation. Let's turn this climate challenge into chances to rebuild our country, so all of us have hope.

Yes, this climate challenge means adjusting our livelihoods and lifestyles, some gains, some losses. Yet each Anzac Day we remember those who gave their lives for us. For most of history, the commons succeeded... I believe in us as a country, our capacity to rise to this challenge, care for each other and thrive.

respectfully,
Liz

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