

28 March 2021

Climate Change Commission Secretariat  
PO Box 24448  
**Wellington 6142**

For the attention of Dr Rod Carr, Chairperson  
*Via upload to Climate Change Submission*

Dear Dr Carr,

Please find enclosed the submissions of Wise Response on the Climate Change Commission's draft advice. **Please disregard the submission of 27 March 2021 as this was not the final and sent in error.**

In making these submissions, in general, we would like to express strong support for the Climate Change Commission (CCC) and for the implementation of its recommendations. A future in which carbon budgets are science-based and mandatory with transformational change, even if we are not satisfied about their ambition and sectoral distribution strategies, is much better for New Zealand's future than one in which there is continuing political uncertainty about limits to emissions, as has happened over the last three decades.

The draft advice, however, was too narrow. If the subsequent discussion, and resultant government action are similarly curtailed, it will become near-term, and superseded. We have the following concerns:

- In our view, the overall emissions budget is not ambitious enough. The reduction in emissions has an IPCC requirement of 45% (median) for the goal of keeping warming to 1.5 °C by 2030. We recommend an emissions budget of reductions to 60% by 2030.
- The limits to growth are overlooked in the advice and recommends inclusion. The advice posits a BAU growth scenario. Limits to growth mean recycling resources or leaving them, not using renewable resources faster than renewal or filling up sinks faster than their capacity to absorb or mitigate.
- There is an absence of nature-based/ecosystems (NbS) solutions and recommends their inclusion. The Paris Agreement on climate change calls on all parties to acknowledge "the importance of ensuring the integrity of all ecosystems, including oceans, and the protection of biodiversity", and 66% of signatories to the agreement NbS solutions in their climate pledges.
- The Conservation Estate and LINZ administered lands, occupy 37% of the land area of New Zealand. These include indigenous forests, woodlands, shrublands, tussock grasslands, wetlands, alpine vegetation and lakes. Carbon storage in several of these ecosystems is high. It is vitally important to protect these areas from degradation because of the ecosystem services, especially in the tussock grasslands, and carbon sequestration they provide.
- A radical national-level behaviour change programme is required in transport to shift the personal private vehicle paradigm with a review of standards to ensure our imports are durable, ethically sourced, and able to be recycled/repurposed easily which we recommend.

- The area New Zealand has jurisdiction over is around 4 million km<sup>2</sup>, with the land area of 268,000 km<sup>2</sup>. Wise Response recommends inclusion in the advice of both coastal and marine ecosystems as these are biomes of importance in the carbon cycle, for both sequestration as well as controlling ocean acidification. Emissions reductions by fishers are required from this area.

As you know, Wise Response is a Dunedin-based but New Zealand-wide, non-partisan Society, with the purpose of persuading the New Zealand Parliament, Government and New Zealand society in general, to confront and respond effectively to any confirmed threats arising from the question: *"As demand for growth exceeds earth's physical limits causing unprecedented risks, what knowledge and changes do we need to secure New Zealand's future wellbeing?"*. Sir Geoffrey Palmer QC and Sir Alan Mark are the patrons.

More information about us can be found on our website: <http://wiseresponse.org.nz/about-wise-response/>.

Thank you for the opportunity to make these submissions. We would be very happy to meet and discuss any aspect of them with you or your staff.

Yours sincerely



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# SUBMISSION TO THE CLIMATE CHANGE COMMISSION

28 March 2021

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# Summary and Recommendations

## Summary

- (i) Wise Response would like to express strong support for the Climate Change Commission (CCC) and that the recommendations are implemented. A future in which carbon budgets are science-based and mandatory with transformational change, even if we are not satisfied about their ambition and sectoral distribution strategies, is much better for New Zealand's future than one in which there is continuing political uncertainty about limits to emissions.
- (ii) The magnitude, scale, and unprecedented nature of the transition from growth of unconstrained fossil fuel production and use to declining imports and production of oil, diesel, petrol, gas and coal, will require a "Moon Shot" level of response. This must include a *Mission Driven* investment in interdisciplinary research, development, and implementation. Such a Mission Driven investment would work on the mission of meeting the emissions trajectories in each sector and seeking transition innovations based on realistic assumptions and transition engineering.
- (iii) The overall emissions budget is not ambitious enough. The reduction in emissions has an IPCC requirement of 45% (median) for the goal of keeping warming to 1.5 °C by 2030. We recommend a budget of emissions reductions of 60% by 2030.
- (iv) Biogenic methane levels need to be reduced significantly. New Zealand's biogenic methane emissions per capita are ten times the world average which leads to the conclusion that our biogenic methane contribution should be higher than the world average in the relevant 1.5°C pathways. Delaying the introduction of significant reductions in short-lived greenhouse gases (methane) goes against the principle of intergenerational equity by passing the responsibility to future generations.
- (v) The recommended target for net zero emissions should be brought forward to 2040 because of the trend for more extreme climate change impacts on key indicators. The planet is trending along the BAU warming scenario with the risk of crossing a tipping point beyond which climate change control becomes difficult and New Zealand has contributed more than its fair share to climate warming and has the wealth and capacity to change.
- (vi) The limits to growth are overlooked in the advice, which posits a BAU growth scenario. In fundamental principle, accommodating limits to growth means recycling resources or leaving them in the land or oceans, not using renewable resources faster than their rate of renewal and not filling up sinks faster than their capacity to absorb or mitigate. Wise Response recommends consideration of the physical reality of limits to growth and its implications for the economy and emissions in plausible scenarios.
- (vii) There is an absence of nature-based/ecosystems (NbS) solutions. The Paris Agreement on climate change calls on all parties to acknowledge "the importance of ensuring the integrity of all ecosystems, including oceans, and the protection of biodiversity, recognized by some cultures as Mother Earth", and 66% of signatories to the agreement commit to 'green' or 'naturebased solutions' (NbS) in their climate pledges. Wise Response recommends the incorporation of NbS for agriculture, native forests, coastal and marine ecosystems in the final advice.

- (viii) The Conservation Estate and LINZ administered lands, occupy 37% of the land area of New Zealand, including a significant area of the country's landscapes and environment of natural beauty. These include indigenous forests, woodlands, shrublands, tussock grasslands, wetlands, alpine vegetation and lakes. Carbon storage in several of these ecosystems (generally some 50% of their organic content) is especially important, particularly the wetlands. It is vitally important to protect these areas from degradation because of the ecosystem services, especially in the tussock grasslands, and carbon sequestration they provide.
- (ix) Based upon the emissions audit undertaken, transport contributes the most carbon dioxide emissions to New Zealand's profile, being 38% in 2018. A radical national-level behaviour change programme is required to shift the personal private vehicle paradigm with a review of standards to ensure our imports are durable, ethically sourced and able to be recycled/repurposed easily. The whole of life emissions cost of EVs should be understood before committing to this as a nationwide solution. Wise Response recommends the emphasis be placed on active transport (walking and cycling, and a network of safe cycle ways) supported by the provision of a high-quality, low-emissions, integrated regional public transport network (i.e. intercity buses and trains).
- (x) The package of recommendations is weak and does not meet the principles of intergenerational equity, relying on future generations to meet this challenge. Significant opportunities exist within agriculture to make substantial reductions in GHG from agriculture and to combine modes of farming both for more efficient land use and more opportunity for mixed rural enterprise. The agricultural sector, as with all productive sectors, is working in its outdated model which is based on extraction of resources to make profit with all resource extraction. Mixed farming with animal integration (ruminants and mono-gastric) *is imperative* because a switch to solely plant-based food systems and monoculture makes New Zealand more reliant on agrichemicals and synthetic fertiliser inputs to achieve *the scale of* productivity necessary to support our own population *and* food exports.
- (xi) The area New Zealand has jurisdiction over is around 4 million km<sup>2</sup>, with the land area of 268,000 km<sup>2</sup>. The lack of inclusion in the advice of both coastal and marine ecosystems are important omissions as these are biomes of importance in the carbon cycle. Especially important is the role of seaweed in carbon sequestration. Banning of bottom trawling is particularly important as this activity releases huge amounts of CO<sub>2</sub> as well as increasing ocean acidification.

## Recommendations

R1 – A “**Moon Shot**” level of response is required to transition from unconstrained growth of fossil fuel production to zero carbon emissions.

R2 – A “**Mission Drive**” investment is necessary for meeting emissions trajectories in each sector seeking transition solutions.

R3 – The **budgets and the NDC** should be based on biogenic methane contributions higher than the world average under 1.5°C; for example, the upper quartile.

R4 – The budget that could be responsibly adopted would require **gross emissions to decrease by 60% by 2030**.

R5 – **Biogenic methane levels** need to be reduced significantly. Any delay goes against the principle of intergeneration equity by passing the responsibility to future generations.

R6 – **Behaviour change** (necessary action 16) should be greater, bolder and more encompassing in the actions for a multisector strategy.

R7 - The recommended target for **net zero emissions** be brought forward to 2040 because:

- The trend for increasingly troubling scientific observations of climate change impacts on key indicators.
- The globe is trending along the business-as-usual warming scenario.
- The risk of crossing a tipping point beyond which climate control becomes difficult.
- New Zealand has contributed more than its fair share to climate warming and has the wealth and capacity to change.
- Economic opportunity lies in innovations in social and engineering technology related to early achievement of a low carbon economy.

R8 –The **Commission should review** just how realistic it is to follow the agricultural reduction pathway proposed, while at the same time achieve the much steeper pathway necessary to comply with the 1.5°C warming limit.

R9 – The Commission should consider the **physical reality of limits to growth** and its implications for the economy and emissions in plausible scenarios as required.

R10 – Fully explore the potential of **Nature based Solutions (Nbs)** as a means of both building resilience to, and mitigating climate change at a faster rate.

R11 – **Recommend Nbs** of conservation agriculture, nutrient management, trees on cropland and biochar usage for agriculture.

R12 – **Protect native forests** and their biodiversity.

R13 – The Commission should seek the **expansion of marine reserves** to 40% of the NZ’s EEZ as well as taking steps to protect and encourage bull kelp as a significant carbon sink, with a total ban on bottom trawling.

R14 – As **fishers in New Zealand’s EEZ** produce another 1 million tonnes of carbon dioxide, they be required to reduce their emissions.

R15 – **Protect coastal wetlands** as part of a comprehensive approach for mitigating against and adapting to climate change.

R16 – Recognise the **conservation estate** as an enormously important carbon sink and protect and extend it where possible.

R17 – A radical national-level **behaviour change programme** is required to shift the personal private vehicle paradigm.

R18 - A radical review of **transport standards** will be required to ensure imports are durable, ethically sourced and able to be recycled/repurposed easily.

R19 - The **whole of life emissions cost of EVs** should be understood before committing to this as a nationwide solution. (must demonstrate it conforms to Carbon reduction milestones and long-term solution)

R20 – **New housing arrangements** need to be designed for multiple mode travel with the focus of movement being on the pedestrian/active modes and public transit rather than the car and should be considered in the RMA reform.

R21 – Greater consideration is needed in relation to **shared active transport** schemes.

R22 – Develop low-emissions **regional public transport networks**.

R23 –The **advice for agriculture** should be fully revisited and the sector provided with a leadership opportunity to demonstrate its ability to reduce emissions significantly.

R24 – Further emphasis could be placed on the **repurposing of plantation forestry** toward other climate-conscious operations, such as for the development of timber-framed built developments.



# 1 Introduction

1.1 Wise Response is a Dunedin-based but New Zealand-wide, non-partisan Society, launched in 2013, with the purpose of persuading the New Zealand Parliament, Government and New Zealand society in general, to confront and respond effectively to any confirmed threats arising from the question: *"As demand for growth exceeds earth's physical limits causing unprecedented risks, what knowledge and changes do we need to secure New Zealand's future wellbeing?"*

1.2 This submission has been shared and developed with a Wise Response discussion list of 50 persons, many having academic expertise in different disciplines. We wish to acknowledge the assistance of the following persons. Individual contributors listed may not, however, necessarily agree with all aspects of the final submission. Contributions to this submission do not limit members making their own submissions in a private or professional capacity.

Professor Elisabeth Slooten

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Professor Emeritus Sir Alan Mark

Catherine Wallace

Distinguished Professor Robert McLachlan

Dr Craig Anderson

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Dr Philip Temple

Gilbert van Reenen

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1.3 Wise Response would, in general, like to express strong support for the Climate Change Commission (CCC) and that the recommendations are implemented. A future in which carbon budgets are science-based and mandatory with transformational change, even if we are not satisfied about their ambition and sectoral distribution strategies, is much better for New Zealand's future than one in which there is continuing political uncertainty about limits to emissions, as has happened over the last three decades. We believe that the CCC has addressed the terms of reference of the Zero Carbon Act. The Report also advances some palatable policy options.

1.4 The draft advice, however, was too narrow. If the subsequent discussion, and resultant government action is similarly curtailed, it will become near-term, and superseded.

1.5 The magnitude, scale, and unprecedented nature of the transition from growth of unconstrained fossil fuel production and use to declining imports and production of oil, diesel, petrol, gas and coal, will require a very high level of response.

- 1.6 The report recommendations must include a *Mission Driven* investment in interdisciplinary research, development, and implementation.
- 1.7 When looking at the historical evidence of currently known or hoped-for solutions, Wise Response sees that carrying on with business-as-usual (BAU) ideas underpinning action will result in business as usual.
- 1.8 The Mission Driven investment would not start with assumed solutions. It would work on the mission of meeting the emissions trajectories in each sector and seeking transition innovations based on realistic assumption and transition engineering.
- 1.9 New Zealand has a unique opportunity, as the place where Transition Engineering was discovered, to take the “NASA” approach to achieving an unprecedented mission. The Report must insist on unprecedented but well known “Moon-Shot” mission-oriented exploration of the future without carbon.

**This submission is divided into three components:**

- Part One - High-level Responses – Background, Assumptions, Path to 2035 and Policy Direction, and Required Drawdown Pathways for the Primary GHGs p 9.
- Part Two – Wise Response Key Issues – Limits to Growth, Nature based solutions and the Conservation Estate p 16.
- Part Three - Additional Topic Areas – Transport, Agriculture, Forestry, inclusion of coastal and marine ecosystems p 24.

Each section is discussed in turn, firstly referencing the recommendations made within the report, then providing explanation of the Wise Response position. After each section recommendations are put forward.

# Part One – High Level Responses

## 2 Background

2.1 In 2013 the founding Chairperson Sir Alan Mark conducted a nation-wide tour with 11 public meetings from Auckland to Invercargill to explain the Society's purpose and strategy, and gain support. The Society has no formal membership beyond the 15 persons who formed the Society. But its strength is in the wide range supporters who participate in online discussions around the "limits" theme, many being experts in their professional fields and who are able to provide multidisciplinary input into our initiatives. Our Patrons are Sir Geoffrey Palmer QC and Sir Alan Mark.

2.1 In April 2014, we presented a 5,000-signature petition to Parliament recommending a Risk Assessment of New Zealand in five categories as follows:

**Financial security:** the risk of a sudden, deepening, or prolonged global financial crisis.

**Energy and climate security:** the risk of continuing our heavy dependence on fossil fuels.

**Business continuity:** the risk exposure of all New Zealand business, including farming, to a lower carbon economy.

**Ecological/Environmental security:** the risks associated with failing to genuinely protect both land-based and marine ecosystems and their natural processes.

**Genuine well-being:** the risk of persisting with a subsidized, debt-based inequitable economy, preoccupied with maximizing consumption and GDP.

Subsequent activities are listed in Appendix A.

## 3 Assumptions behind this submission

3.1 The growth-dependent, fossil-fuel based economy that is responsible for climate change is on a collision course with biophysical limits in a closed material system.

3.2 Climate change is a symptom of unsustainable living arrangement that, should it continue, it is highly plausible that it could lead to the extinction of humankind, along with other life forms on earth.

3.3 Addressing climate change is primarily a social challenge, as we have the technology and knowledge to meet this challenge given the will to meet it.

3.4 It is unlikely this change can be made without deliberately restricting the rate of resource throughput and which implies an economic contraction. Accordingly, it is very unlikely that the economy will continue to expand while making the necessary transition. fact that not all change will be a "win-win" should not mean avoidance or denial of uncomfortable questions.

3.5 The highest collective rate of reduction is least risk. Impacts associated with a 2°C average temperature increase are now considered too onerous so a target of 1.5°C is highly desirable.

3.6 There is already a likely overshoot and thus a need to do the maximum possible for New Zealand to play its part in the reduction of GHG. Such a position is supported by human footprint analysis, which has the current impact of humanity at 1.7 planets.

## 4 Path to 2035 and Policy Direction

- 4.1 Wise Response does not find the overall emissions budget ambitious enough. The reduction in emissions from 2010 to 2030 is budgeted at about 20% in contrast to an IPCC requirement of 45% (median) for the goal of keeping warming to 1.5 °C.
- 4.2 Wise Response agrees with the findings of the UK Cusp report “nonlinear pathways, such as those with constant percentage reduction rates, have a higher chance of remaining within the available budget provided that the reduction starts early enough, and the reduction rate is high enough for the UK<sup>1</sup>. It is notable that reduction rates high enough both to lead to zero carbon (on a consumption basis) by 2050 and to remain within the carbon budget require absolute reductions of more than 95% of carbon emissions as early as 2030. On this basis, a UK target for net zero carbon emissions by 2030 or earlier, with a maximum of 5% emissions addressed through negative emission technologies” is argued.
- 4.3 New forestry plantings occurred from 1990-2003 then stopped, with now net clearance. Plantation forestry is a short-term solution, which is unfair to intergenerational equity, and New Zealand is now confronted with policies of the past.
- 4.4 Wise Response recommends that the highest reductions budget that could be responsibly adopted would require gross emissions to decrease by 60% by 2030.
- 4.5 We believe that this is the reductions budget we can responsibly adopt, considering scientific advice to avoid a global catastrophe and if it can be regarded as fair for our contribution of keeping the warming to 1.5°C.
- 4.6 Wise Response supports locking in net zero and the focus on decarbonising sources of long-lived gas emissions.
- 4.7 Biogenic methane levels need to be reduced significantly. For methane, the global temperature impact depends (as a first order approximation) on the sustained *rate* of emissions. Therefore, to reduce their historical contribution to temperature change methane emissions rates need to be reduced.
- 4.8 Delaying the introduction of significant reductions in short-lived greenhouse gases (methane) goes against the principle of intergeneration equity by passing the responsibility to future farmers. Wise Response notes that the short half-life of methane means the GHG impacts on warming can be reduced quickly if it is curtailed.
- 4.9 The considerations in the Draft Advice, together with others (that New Zealand’s biogenic methane emissions per capita are ten times the world average; that grandfathering in present emissions is not accepted; and other environmental impacts of current ruminant farming) lead to the conclusion that our biogenic methane contribution should be higher than the world average in the relevant 1.5°C pathways, not lower (as in the draft budgets) or “at least the global average” (as in Sec. 9.4.4).

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<sup>1</sup> Jackson T 2019: Zero Carbon Sooner—The case for an early zero carbon target for the UK. CUSP Working Paper No 18. Guildford: University of Surrey. Online at: [www.cusp.ac.uk/publications](http://www.cusp.ac.uk/publications).

- 4.10 Over the 20- to 50-year period methane induced warming is much more important, and a recent modelling approach makes more certain the importance of near-term emissions reductions, and not those later in the 21<sup>st</sup> century<sup>2</sup>.
- 4.11 The increase in water vapour is a consequence of global warming produced by the main GHGs. Hence methane reductions must be addressed together with carbon dioxide and nitrous oxide, and agriculture involved as soon as possible for this reason.
- 4.12 By legislating for a split gas approach in the Zero Carbon Act has given the CCC an immediate challenge as the Paris Agreement does not use a split gas approach. The split gas approach and GWPs\* used in New Zealand has now been firmly discredited scientifically.<sup>3</sup>
- 4.13 For similar reasons, Wise Response supports extending the principle of no offshore mitigation to achieving our NDCs. The CCC notes (p. 157) that offshore mitigation might not be needed to reach our first NDC if a methane inhibitor or vaccine can be brought online. This remark underlines for us the availability of multiple domestic policy options (not just a methane vaccine) to reach our NDCs that are all preferable to purchasing overseas offsets as individuals and households.
- 4.14 Households are responsible for only around 10% of GHG by volume but as a means by which to create momentum and normalize transition, their role is potentially much more significant.
- 4.15 Wise Response strongly supports the limit on offshore mitigation being set to zero for the first three budget cycles. We believe this is especially important as it encourages reductions in gross emissions, rather than relying on forestry offsets. This need not preclude international climate mitigation through other mechanisms outside the framework of the NDC and the Zero Carbon Act.
- 4.16 We broadly support the enabling recommendations in the advice - cross party support for emissions budgets, coordination of efforts across government, partnership with iwi/Maori and working in partnership between central and local government and establishing processes that engage all New Zealanders.
- 4.17 We support the seven principles outlined in the report and note that principle two and six are particularly important. One of the results of the current mitigation strategy is for action on mitigation elsewhere (principle two). An action that lessens the impacts of climate extremes (principle six) assists with climate adaptation.
- 4.18 Wise Response posits that the support for behaviour change (necessary action 16) should be greater, bolder and more encompassing in the actions for a multisector strategy. Behavioural change will be essential to the success of emissions reductions and capacity to deliver across all sectors. Government can provide significant support, communication, and education to the public and private sectors in terms of funding this vital process of change.

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<sup>2</sup> McKenna, C.M., Maycock, A.C., Forster, P.M. *et al.* Stringent mitigation substantially reduces risk of unprecedented near-term warming rates. *Nat. Clim. Chang.* **11**, 126–131 (2021).  
<https://doi.org/10.1038/s41558-02000957-9>

<sup>3</sup> Rogelj, J., and Carl-Friedrich Schleussner. Unintentional unfairness when applying new greenhouse gas emissions metrics at country level. 2019 *Environ. Res. Lett.* **14** 114039

**Recommendations:**

R1 – A “Moon Shot” level of response is required to transition from unconstrained growth of fossil fuel production to zero carbon emissions.

R2 – A “Mission Drive” investment is necessary for meeting emissions trajectories in each sector seeking transition solutions.

R3 – The budgets and the NDC should be based on biogenic methane contributions higher than the world average under 1.5°C; for example, the upper quartile.

R4 – The budget that could be responsibly adopted would require gross emissions to decrease by 60% by 2030.

R5 – Biogenic methane levels need to be reduced significantly. Any delay goes against the principle of intergeneration equity by passing the responsibility to future generations.

R6 – Behaviour change (necessary action 16) should be greater, bolder and more encompassing in actions for a multisectoral strategy

## 5 Required Drawdown Pathways for the Primary GHGs

- 5.1 While CO<sub>2</sub> is the dominant greenhouse gas, keeping global warming less than 2°C or 1.5°C clearly requires control of all greenhouse gases and especially methane (CH<sub>4</sub>) - the second most significant. “Early mitigation of CH<sub>4</sub> emissions would significantly increase the stabilizing global warming below 1.5 °C, alongside having co-benefits for human and ecosystem health”<sup>4</sup>. The analysis for IPCC AR6 shows that the broader effects of methane, on atmospheric chemistry and ozone levels in urban areas, also need to be recognized as sensitive to the global average atmospheric CH<sub>4</sub> concentration.
- 5.2 The importance of CH<sub>4</sub> is recognized explicitly in greenhouse gas emission scenarios now being used across all climate models for the IPCC AR6 assessment report. The following figure shows changes in emissions, relative to those in 2015, for both CO<sub>2</sub> and CH<sub>4</sub>, in the region covering New Zealand, Australia and Indonesia and is consistent with keeping below 2°C (SSP1-26, hollow symbols) and 1.5°C (SSP1-19, solid symbols)<sup>5</sup>.
- 5.3 For both temperature targets agriculture has been treated carefully in these scenarios because of its importance: in both cases significant reductions in agricultural emissions are still required. The 1.5°C target requires that a significant reduction in agricultural CH<sub>4</sub> emissions occurs before 2030, rather than allowing a delay as is possible for the 2°C target.
- 5.4 Atmospheric CH<sub>4</sub> has been increasing since late 2006, and the importance of rectifying this to address climate targets is becoming increasingly recognized by scientists. A recent analysis of the CH<sub>4</sub> budget was presented at the American Geophysical Union conference in Washington DC in December 2018<sup>6</sup>; and in a paper on ways of managing methane emissions<sup>7</sup>.
- 5.5 The graphs on the next page show relative changes in global emissions rather than any breakdown into different types of country. There are arguments that New Zealand should be able to cut its emissions more rapidly than the global average. Others would say that because we are very efficient in dairy and meat production per tonne of CH<sub>4</sub> emitted and most of it is exported, New Zealand should be allowed to have a slower reduction than other countries such as India. The details are complex. FAO reports show that there are many countries more efficient than New Zealand in terms of litres of milk per tonne of CH<sub>4</sub> emitted. In India buffalo milk is predominant and is seen as more nutritious than cow's milk.

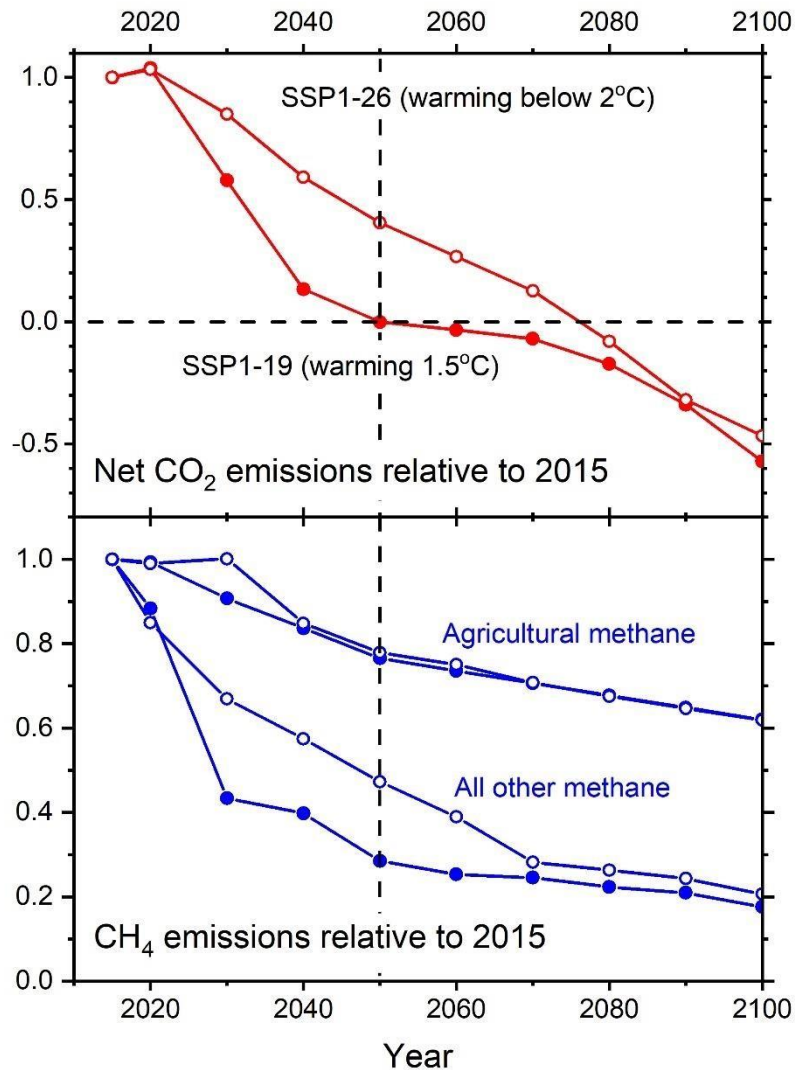
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<sup>4</sup> Collins, W. J., C. P. Webber, P. M. Cox, C. Huntingford, J. Lowe, S. Sitch, S. E. Chadburn, E. Comyn-Platt, A. B. Harper, and G. Hayman (2018), Increased importance of methane reduction for a 1.5 degree target, *Environmental Research Letters*, 13(5), 054003.

<sup>5</sup> Emissions data used here are publicly available at: <https://tntcat.iiasa.ac.at/SspDb/dsd>

<sup>6</sup> Dlugokencky, E., M. Manning (presenter), E. Nisbet, and S. Michel (2018), Recent Increases in the Burden of Atmospheric CH<sub>4</sub>: Implications for the Paris Agreement, in AGU Fall Meeting: Rising Atmospheric Methane: Causes and Consequences, Washington DC.

<sup>7</sup> Nisbet, E. G., Fisher, R. E., Lowry, D., France, J. L., Allen, G., Bakaloglu, S., et al. (2020). Methane mitigation: methods to reduce emissions, on the path to the Paris agreement. *Reviews of Geophysics*, 58, e2019RG000675. <https://doi.org/10.1029/2019RG000675>.



5.6 From the graphs are:

- To limit the global temperature increase to 1.5 °C, global net CO<sub>2</sub> emissions need to halve by 2030 and be zero by 2050.
- Even then the rate of emissions abstraction from the atmosphere needs to be at about 50% of the current discharge rate by 2100 and climbing.
- To limit the global temperature increase to 1.5°C, methane from agriculture needs to decline by 20% by 2050 and all other methane by 70%.

5.7 The rate chosen for agriculture will affect the rate required for all other gases. Given the nature of other methane sources, including melting of permafrost and deep-sea sources, just how realistic a 70% reduction is unclear.

5.8 A higher rate of agricultural emissions would likely make for a more reasonable rate of emissions reduction for all other methane.



**Recommendations:**

R8 –The Commission should review the possibility of following the proposed agricultural reduction pathway while at the same time expecting to achieve the much steeper path way necessary to comply with the 1.5°C warming limit.

R7 - The recommended target for net zero emissions be brought forward to 2040 because:

- The trend for increasingly troubling scientific observations of climate change impacts on key indicators.
- The globe is trending along the business-as-usual warming scenario.
- The risk of crossing a tipping point beyond which climate change control becomes difficult.
- New Zealand has contributed more than its fair share to climate warming and has the wealth and capacity to change.
- Economic opportunity lies in innovation of social and engineering technology related to early achievement of a low carbon economy.

## Part Two – Wise Responses Big Issues

### 6 Summary of Big Issues

6.1 Wise Response has three ‘big issues’ regarding the draft advice:

- The implications of limits to growth on capacity to transition and on emissions themselves are hardly considered.
- An absence of nature/ecosystem-based solutions and urgency in the agricultural sector.
- The importance of the conservation estate in carbon storage.

### 5 The limits to growth are largely overlooked in the advice

7.1 Nearly five decades after the Club of Rome published its landmark report, debates about the Limits to Growth occur. There is unsettling evidence that society is tracking the ‘standard run’ of the original study – which leads ultimately to collapse. Detailed and recent analyses suggest that production peaks for some key resources are upon us. The evidence of our proximity to planetary boundaries is even more striking. ‘Even before we run out of oil,’ argues climate change activist Bill McKibben, ‘we’re running out of planet’.

7.2 Meeting the Paris Agreement on climate change alone means a radical transformation of our investment portfolios, our technologies, and our consumption patterns.

7.3 The CCC posits growth in GDP over the period of advice and to 2050. “The transition must reduce emissions at pace while allowing the country to continue to grow, so that future generations inherit a thriving, climate-resilient and low emissions Aotearoa”. This assumes that the world will be continuing a ‘business as usual’ (BAU) economic pathway.

7.4 New data strongly suggests either capitalism or the environment can be supported, — but not both,<sup>8</sup> and BAU is not sustainable.

7.5 More recently, a consortium of scientists associated with the Planetary Boundaries project reached much the same conclusions using modern data and modelling techniques.<sup>9</sup> As of 2015, on a global scale, we are exceeding four of the nine boundaries for supporting life on earth (climate, biodiversity, land use, and use of fertilisers). The New Zealand Ministry for the Environment released an application of this methodology late last year that concluded that we are exceeding each of the five planetary boundaries assessed within the study, while noting that ‘sustainable solutions exist to significantly reduce pressures on planetary boundaries. Reducing these pressures will also support regeneration of New Zealand’s natural capital for long-term economic ‘prosperity’.

7.6 In fundamental principle, accommodating limits to growth means:

**Recycling finite resources 100% or leaving them in the ground.**

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<sup>8</sup> Hickel, J. Why growth can’t be green. <https://foreignpolicy.com/2018/09/12/why-growth-cant-be-green/>

<sup>9</sup> W. Steffen et al., Science 347, 1259855 (2015). DOI: 10.1126/science.1259855

**Not drawing down renewable resources faster than their rate of renewal.**

**Not filling up sinks faster than their capacity to absorb or mitigate.**

#### Recommendations

**R9 – Consider the physical reality of limits to growth and its implications for the economy and emissions in plausible scenarios.**

## 8 Absence of nature/ecosystems-based approaches

- 8.1 The Paris Agreement on climate change calls on all parties to acknowledge “the importance of ensuring the integrity of all ecosystems, including oceans, and the protection of biodiversity, recognized by some cultures as Mother Earth”, and 66% of signatories to the agreement commit to ‘green’ or ‘nature-based solutions’ (NbS) in their climate pledges.<sup>10</sup>
- 8.2 NbS are cost-effective interventions that can enhance resilience in agriculture, forestry and marine ecosystems while mitigating climate change and enhancing the environment.
- 8.3 Better stewardship or management can occur in all major natural terrestrial habitats –grasslands, wetlands and agricultural lands; and marine environments<sup>11</sup> with NbS solutions could help to provide up to 37% of the CO<sub>2</sub> mitigation needed through to 2030<sup>12</sup>.
- 8.4 NbS can also be incorporated into the built environment to alleviate the impact of climate change.

### Agriculture

8.4.1 The CCC has missed an important opportunity in proposing answers that build up carbon on farms throughout New Zealand. Greater consideration of nature-based solutions (NbS) is required, for example:

- Conservation agriculture – where sustainable agriculture production systems comprise a set of farming practices adapted to the requirements of crops and local conditions of the District, whose farming and soil management techniques protect the soil from erosion and degradation, improve its quality and biodiversity, and contribute to the preservation of the natural resources, water, and air, while optimizing yields. These include (i) minimum soil disturbance through no tillage for annual crops, (ii) maintenance of permanent soil covers with ground covers, and (iii) cropping system diversity with crop rotation.

<sup>10</sup> Seddon, N., Turner, B., Berry, P. *et al.* Grounding nature-based climate solutions in sound biodiversity science. *Nature Clim Change* 9, 84–87 (2019). <https://doi.org/10.1038/s41558-019-0405-0>

<sup>11</sup> Anderson, L. *et al.* (2020). A Safe Operating Space for Aotearoa/New Zealand. <https://www.mfe.govt.nz/publications/land-climate-change-fresh-water/safe-operating-space-new-zealandaotearoa-translating>

- Nutrient management where chemical fertiliser inputs are minimised (including nitrous oxide emissions) by promoting biological systems and the enterprise is chosen to minimise emissions. An example of the wide range of emissions from different protein production systems is shown in the table below.

<b>Carbon footprint of protein rich feeds (Hanah Ritchie, Feb 4 2020)</b> (per 100 gm protein)	<b>kg CO<sub>2</sub> equivalent</b>
Beef	25
Lamb	20
Farmed sheep	10
Cheese	8.4
Pork	6.5
Chicken	4.3
Eggs	3.8
Farmed fish	3.5
Tofu	1.6
Beans	0.65
Peas	0.36
Nuts	- 0.8 (ie net negative)

- Trees on croplands. Trees absorb and store vast amounts of carbon throughout their life. Planting trees on croplands can provide windbreaks and shelter for crops, prevent erosion, diversify production, and maintain moisture levels, while reducing carbon emissions.
- Biochar usage. Crop residue can be baked in special oxygen-free furnaces to convert it to a form of charcoal called biochar, which does not easily decompose. This adds carbon to the soil.

## Native Forests

8.4.2 Native forests are nationally important in regulating microclimates and locally important in sustaining communities and supporting biodiversity as well as many other ecosystems functions from carbon sequestration to water conservation and management.<sup>13</sup>

8.4.3 Top priority NbS for climate change is to protect primary forests and their biodiversity, the next order of priority is ecological restoration of degraded forests, also known as proforestation. This allows degraded forests to begin to regain their primary forest values over time.

8.4.4 Following proforestation, the next restoration objective should be to regenerate forests naturally where they have been cleared. Forests often regenerate most easily next to primary forest patches because even small remnants of primary forests serve a vital function as seed banks, and as habitat

<sup>13</sup> <https://www.iucn.org/crossroads-blog/202003/primary-forests-a-priority-nature-based-solution#:~:text=Nature%2Dbased%20solutions%20are%20defined,%2Dbeing%20and%20biodiversity%20benefits%E2%80%9D>.

for seed dispersers.

## Coastal wetlands

8.4.5 Globally coastal wetlands sequester and store large quantities of atmospheric carbon relative to their size.<sup>14, 15</sup> At a national and sub-national level, the extent of coastal wetland CS&S is uncertain,<sup>16</sup> but likely to be significant.<sup>9, 17, 18</sup> Coastal wetlands also attenuate storm surge and erosion, thereby protecting against climate change-exacerbated impacts.<sup>11</sup> Coastal wetlands are highly biological productive and act as contaminant filters, therefore playing a key role in maintaining healthy near-shore marine systems.<sup>20</sup>

8.4.6 Protecting these systems is part of a comprehensive approach to mitigating against and adapting to climate change. The extent and health of coastal wetlands is influenced by hydrology and sedimentation/run-off, meaning a catchment approach is required. This complies with the goals of the National Policy Statement for Freshwater Management 2020 and an existing need to shift land-use patterns to reduce contaminant run-off and prepare for climate change impacts. This can be done while reducing emissions through lifestyle changes, again assisted by changes in land-use patterns. Therefore, protecting and enhancing coastal wetlands is part of a positive cycle of habitat protection and restoration complementing other climate compatible development initiatives.

8.4.7 To generate the required catchment-level changes, incentives and regulations could be attached to existing land use rights and resource consents. These can be combined with landscape-level investment in ecosystem restoration, also attached to property rights, as being investigated in the UK.<sup>19</sup> This would fit with recommendations by the Resource Management Review Panel for a legislative focus on enhancing environmental quality rather than on mitigating negative effects.

## Marine Ecosystems

8.4.8 Overfishing and habitat destruction due to local and regional threats are undermining fisheries, biodiversity, and the long-term sustainability of marine ecosystems in the New Zealand Exclusive Economic Zone and wider – which is 15 times the land area of Aotearoa New Zealand.

8.4.9 Over the 4 million sq. km of New Zealand's Exclusive Economic Zone fishers extracted 540,000 tonnes of catch in 2012<sup>20</sup>. Emissions factors per tonne of catch have been calculated for Oceania

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<sup>14</sup> Daniel M. Alongi (2020) Global significance of mangrove blue carbon in climate change mitigation *Sci* 2020 2:(67) doi:10.3390/sci2030067.

<sup>15</sup> Jay Gao Suyadi, Carolyn J. Lundquist & Luitgard Schwendenman (2020) Aboveground carbon stocks in rapidly expanding mangroves in New Zealand: regional assessment and economic valuation of blue carbon. *Estuaries and Coasts* 43:1456-1469.

<sup>16</sup> Pierre Taillardat, Daniel A. Friess & Massimo Lupascu (2018) Mangrove blue carbon strategies for climate change mitigation are most effective at the national scale *Biology Letters* 14:20180251.

<sup>17</sup> Behnaz Khodabakhshi (2017) *Benefit, co-benefits and policy implications of restoring coastal wetlands in Auckland: a climate change perspective* PhD thesis, University of Auckland.

<sup>18</sup> Stephen Knight-Lenihan (2017) Net environmental benefit in urban centres *Landscape Review* 17(2) 44-55. <sup>20</sup> S. Sandilyan & K. Kathiresan (2012) Mangrove conservation: a global perspective *Biodiversity and Conservation* 21:3523-3524.

<sup>19</sup> Stephen Knight-Lenihan (2020) Achieving biodiversity net gain in a neoliberal economy: the case of England *Ambio* <https://doi.org/10.1007/s13280-020-01337-5>.

<sup>20</sup> <http://www.fao.org/fishery/facp/NZL/en>

of 1.8 tonnes of CO<sub>2</sub>/tonne of catch<sup>21</sup>, giving a total of an extra 970,000 tonnes of CO<sub>2</sub> emitted in New Zealand's territorial waters. Wise Response recommends that fishers be required to reduce their emissions.

8.4.10. The NbS includes marine reserves - well-designed and effectively managed marine reserve networks can reduce local threats, and contribute to achieving multiple objectives regarding carbon sequestration, fisheries management, biodiversity conservation and adaptation to changes in climate and ocean chemistry<sup>22</sup>.

8.4.11 Wise Response recommends a large expansion of marine reserves around our coasts and within New Zealand's EEZ. around our coastlines and within the New Zealand's EEZ.

8.4.12 A recent report has found that bottom trawling releases as much CO<sub>2</sub> as global aviation – which accounts for 2% of human emissions. Bottom trawling, a fishing method that involves dragging heavy nets across the seafloor, is responsible for between 0.6 and 1.5 gigatonnes of carbon emissions a year, compared with the aviation industry's emissions of close to 1Gt<sup>23</sup>.

8.4.13 A recent work has highlighted the importance of the ocean as a way of enhancing sequestration of carbon and notably the role of kelp in this process<sup>24</sup>.

#### Recommendations

R10 – Fully exploit the potential of NbS as a means of both building resilience to, and mitigating climate change at a faster rate.

R11 – Recommend NbS of conservation agriculture, nutrient management, trees on cropland and biochar usage for agriculture.

R12 – Protect native forests and their biodiversity.

R13 - An expansion of marine reserves to 40% of the NZ's EEZ as well as steps to protect and encourage bull kelp as a significant carbon sink, with a total ban on bottom trawling.

R14 – As fishers in New Zealand's EEZ produce another 1 million tonnes of carbon dioxide, they be required to reduce their emissions.

R15 – Protect coastal wetlands as part of a comprehensive approach for mitigating against and adapting to climate change.

<sup>21</sup> Krista Greer, Dirk Zeller, Jessika Woroniak, Angie Coulter, Maeve Winchester, M.L. Deng Palomares, Daniel Pauly, Global trends in carbon dioxide (CO<sub>2</sub>) emissions from fuel combustion in marine fisheries from 1950 to 2016, *Marine Policy*, Volume 107, 2019, 103382, ISSN 0308-597X, <https://doi.org/10.1016/j.marpol.2018.12.001>.

<sup>22</sup> Alison L. Green, Leanne Fernandes, Glenn Almany, Rene Abesamis, Elizabeth McLeod, Porfirio M. Aliño, Alan T. White, Rod Salm, John Tanzer & Robert L. Pressey (2014) Designing Marine Reserves for Fisheries Management, Biodiversity Conservation, and Climate Change Adaptation, *Coastal Management*, 42:2, 143159, DOI: [10.1080/08920753.2014.877763](https://doi.org/10.1080/08920753.2014.877763)

<sup>23</sup> Sala, E., Mayorga, J., Bradley, D. *et al.* Protecting the global ocean for biodiversity, food and climate. *Nature* (2021). <https://doi.org/10.1038/s41586-021-03371-z>

<sup>24</sup> Halley E. Froehlich, Jamie C. Afflerbach, Melanie Frazier, Benjamin S. Halpern, Blue Growth Potential to Mitigate Climate Change through Seaweed Offsetting, *Current Biology*, 29 (18), 2019, 3087-3093 <https://doi.org/10.1016/j.cub.2019.07.041>.

## 9 The Conservation Estate - Carbon storage and ecosystem services

- 9.1 The Conservation Estate and LINZ administered lands, occupies 37% of the land area of New Zealand, including a significant area of the country's landscapes and environment of natural beauty.
- 9.2 These include indigenous forests, woodlands, shrublands, tussock grasslands, wetlands, alpine vegetation and lakes. Carbon storage in several of these ecosystems (generally some 50% of their organic content) is especially important, particularly the wetlands. The biodiversity values while very high, could and should be increased with more effective control of introduced mammalian herbivores and predators by the Department of Conservation. Considerable additional areas are secured in formally and permanently protected covenants.
- 9.3 The indigenous forests and tussock grasslands also store large amounts of carbon in both below- and aboveground components. The upland snow tussock grasslands, in good condition, may have above-ground standing crops of 3.8-8.7 kg sqm (narrow-leaved snow tussock: *Chionochloa rigida* grassland) or to 1.6-6.6 kg sqm (slim snow tussock: *C. macra* grassland)<sup>25</sup>.
- 9.4 Ecosystem services have been described for the indigenous tussock grasslands, where water yield in the upland snow tussock grasslands may reach 80% of the measured precipitation (c.1365 mm p.a.) in fog-prone areas, which supplement the precipitation especially in the semi-arid areas. The normal value in areas where fog is unimportant is a 60-65% yield<sup>25</sup>. Improved water yield supports more robust biodiversity and provides more scope for climate- friendly land use.
- 9.5 It is vitally important to protect these areas from degradation because of the ecosystem services<sup>26</sup>, especially in the tussock grasslands, and carbon sequestration they provide.

### Recommendations

R16 – Recognize the conservation estate as an enormously important carbon sink and protect and extend it where possible.

<sup>25</sup> Holdsworth, D.K. and Mark, A.F. 1993. Water and nutrient input:output budgets: effects of plant cover at seven sites in upland snow tussock grassland of eastern and Central Otago, New Zealand. *J. Roy. Soc. N.Z.* 20: 1-24.

<sup>26</sup> Mark, A.F., Barratt, B.I.P. and Weeks, E. 2013. Ecosystem services in New Zealand's indigenous tussock grasslands: Conditions and trends, in, Dymond, J.R. (ed). *Ecosystem Services in New Zealand*. Lincoln, Manaaki Whenua Press. 1-35.

<sup>25</sup> Mark, A.F. 1993. Indigenous grasslands of New Zealand, in Coupland, R.T. and Goodall, D.W. (eds). *Natural Grasslands: Eastern hemisphere*. Ecosystems of the World 8B. Amsterdam, Elsevier: 372-410.

## Part Three – Additional Topic Areas

### 10. Transport

10.1 Wise Response compliments the Commission on recognising that New Zealanders need to build and plan cities and the way people and products move around.

10.2 We fully agree with Necessary Action Two – develop an integrated national transport network to reduce travel by private vehicles and increase walking, cycling, public and shared transport. Again, spatial planning would help to unlock the potential for this to occur.

10.3 Based upon the emissions audit undertaken, transport contributes 38% of New Zealand’s carbon dioxide emissions<sup>27</sup>. It is a high priority that we have identified four key themes for the commission to reflect on:

- *Priority to be given to spatial planning and local or electronic access to all essential services, so that the need for physical travel can be minimised.*
- *Transition from ICE to EV is a short-term solution – the personal private vehicle paradigm needs to be shifted.*
- *Full low emissions transformation of public and active transport networks is required.*
- *Freight and haulage innovation will be essential*

#### ***Transition from ICE to EV is a short-term solution – the personal private vehicle paradigm needs to be shifted***

10.4 Wise Response only partially supports Time Critical Necessary Action Two and Necessary Action Three – accelerate light electric vehicle uptake.

10.5 Reliance on transition to personal EVs may reduce national emissions but is an imperfect solution as it risks perpetuating the high private car expectation. It also places New Zealand at risk of creating significant emissions offshore during the manufacturing and importing process. These emissions include;

- embodied carbon in electric vehicles;
- disposal of the existing fleet;
- loss of co-benefit opportunity associated with alternative travel modes;
- There are also significant environmental and social impacts from the sourcing of rare earth minerals for batteries.

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<sup>27</sup> Ministry for the Environment, 2020. New Zealand’s Greenhouse Gas Inventory 1990 -2018.  
<https://www.mfe.govt.nz/sites/default/files/media/Climate%20Change/new-zealands-greenhouse-gas-inventory-1990-2018-vol-1.pdf>



10.6 There is a significant cultural attachment to individual personal transport and cars that can only be addressed by a range of interventions that include a combination of incentives and disincentives (such as road pricing and tariffs on heavy vehicles that require more energy to move). Only with the correct balance of these will New Zealand be in a position to break existing patterns of travel and overcome the barriers to mode shift e.g. taking public transport or using active travel.

10.7 Significant review of standards will be required to ensure our imports are high quality, ethically sourced and able to be recycled/repurposed easily.

10.8 Essential EV transition will be slow without provision of considerable financial incentives.

***Full transformation of public and active transport networks is required.***

10.9 Instead, greater emphasis should be placed on the transformation of the public and active transport networks, at a local, regional and intercity level. For example, Queenstown's transport business case adopted by the Queenstown Lakes District Council in January 2021<sup>28</sup> is working towards a mode shift of 40% toward public transport by 2028 and 60% by 2048 on its busiest route.

10.10 Massive mode shift and innovation is required, with a complete change in behaviour needed. Whilst this is a truly daunting prospect, Aotearoa New Zealand needs to take a bolder approach and have public and active transport in the forefront of the urban and regional network design as well as in future urban developments and redevelopment of existing urban areas.

10.11 "Shifting from cars to public transport can deliver a 65 per cent emissions reduction during peak times and a 95 per cent reduction in emissions during off peak times from the commuters that make the shift<sup>30</sup>."

10.12 Investment should concentrate on convenient, affordable, reliable and clean public transport<sup>29</sup> as well as separated, safe bicycle and walking infrastructure. Investing in these modes invests in a transport system that has co-benefits with many other systems by improving health, increasing connection with nature and other people, requiring lighter infrastructure that uses less carbon and causes less damage, reducing consumption and reducing congestion; all of which can be multipliers of further emissions reduction.

10.13 Given that "One-sixth of household car trips in New Zealand are under 2km long and almost half are less than 6km long" and 63% less than 10kms long, moving this sector to bikes, foot and public buses could be significant<sup>30</sup>.

10.14 Public transport will be key to fundamental mode shift, as there are groups and circumstances that will not be able to use active transport as a consistent commuter option. This is particularly

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<sup>28</sup> Queenstown transport business case (Agenda item 5; p. 85). (2021). Queenstown Lakes District Council. <sup>30</sup> Climate Change and Public Transport. (n.d.). Retrieved February 7, 2021, from <http://bic.asn.au/informationfor-moving-people/climate-change-and-public-transport>

<sup>29</sup> Higashide, S. (2019). Better Buses Better Cities

<sup>30</sup> Ministry of Transport, Household Travel Survey, 2003–2009. (n.d.).

pronounced for people with young children, older people and disabled people. Public transport is a more appealing option for many during cold winters in the district.

10.15 If there is no safe footpath or no safe cycling place, people will not be able to walk or cycle from home. The Republic of Ireland last year agreed to commit 20% of its roading budget to cycling and pedestrian infrastructure<sup>33</sup>. Greater support needs to be given to local government and community groups that are focussed on building community-connecting networks of tracks and trails throughout the country.

10.16 RMA reform needs to focus on the role of spatial planning and developer regulation in ensuring that subdivisions and developments are well-provided for. Subdivisions and developments need to be designed for multiple mode travel with the focus of movement being on the pedestrian/active modes and public transit rather than the car. Densities, housing typologies and design also play a role in this with increased densities making it more feasible for a good public transport system.

10.17 Further innovation is required to enable broader use of e-bikes where possible and other alternative transport solutions e.g., gondolas or trackless trams. For example, Lisbon and many other cities have share e-bike or e-scooter schemes,<sup>31</sup> whilst Sweden subsidises 25% of ebike purchases<sup>32</sup>. National level schemes are essential to ensure equitable access to these opportunities, with a particular emphasis on the share economy, which reduces consumerism and unnecessary waste. Further consideration of these schemes is recommended by central government to identify models that could be implemented across the country.

10.18 The lack of a high-quality, low-emissions, integrated regional public transport network (i.e., intercity buses and trains) is an obstacle to reducing domestic aviation emissions, to households reducing their number of motor vehicles, and is a cause of transport poverty for non-car owners.

### ***Freight and haulage innovation will be essential***

10.19 Wise Response fully supports Necessary Action Four – increased use of low carbon fuels for trains, ships, heavy trucks and planes. It will be essential to continue to innovate in this space as it may be the last aspect of road transport to be electrified.

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<sup>31</sup> (*Hilly Lisbon Launches Electric Bike Share System in Bid to Solve Congestion*, 2017).

<sup>32</sup> Twitter, T. (n.d.). Sweden Offers a 25% Subsidy for Electric Bike Purchases. Treehugger. Retrieved February 6, 2021, from <https://www.treehugger.com/sweden-offers-subsidy-electric-bike-purchases-4857202>

## Recommendations

**R17 – A radical national-level behaviour change programme is required to shift the personal private vehicle paradigm.**

**R18 - A radical review of standards will be required to ensure our transport imports are durable, ethically sourced and able to be recycled/repurposed easily.**

**R19 - The whole of life emissions cost of EVs should be understood before committing to this as a nationwide solution. (must demonstrate it conforms to Carbon reduction milestones and longterm solution)**

**R20 – New housing arrangements need to be designed for multiple mode travel with the focus of movement being on the pedestrian/active modes and public transit rather than the car and should be considered in the RMA reform.**

**R21 – Greater consideration is needed in relation to shared active transport schemes.**

**R22 – Develop low-emissions regional public transport networks.**

## 11 Agriculture

- 11.1. Significant opportunities exist within agriculture to make substantial reductions in GHG from agriculture. The agricultural sector, as with all productive sectors, is working in its outdated model which is based on extraction of resources to make profit with all resource extraction and processing into products based on deploying energy resources (with accompanying emissions – irrespective of whether energy sources are ‘renewable’ or not). For example, the EU’s Farm to Fork (F2F) strategy has set a target of 25% of agricultural land in the EU being farmed organically by 2030, a three-fold increase.
- 11.2. Mixed farming with animal integration (ruminants and mono-gastric) *is imperative* because a switch to solely plant-based food systems and monoculture makes New Zealand more reliant on agrichemicals and synthetic fertiliser inputs to achieve *the scale of* productivity necessary to support our own population *and* food exports. It should be noted that this transition also offers opportunity for revitalising rural communities and landscapes.
- 11.3 The report was a focus on pastoral systems with no emphasis on horticulture (annual and perennial). Significant opportunity exists to combine modes of farming both for more efficient land use and more opportunity for mixed rural enterprise creating meaningful economic opportunities in our rural regions. Changes in consumer preferences and diet also requires access to locally produced fruits, nuts, vegetable and arable products. It should also be noted that land suitability changes with available infrastructure.
- 11.4 Wise Response does not support the actions proposed for agriculture. Time Critical Necessary Action Four (reducing biogenic agricultural emissions through on-farm efficiency and technology) does not provide strong enough guidance or sufficiently bold targets. Necessary Action 11 (options for alternative farming systems and practices) does not provide enough detail or exploration of preferable alternative models.

11.5 The package of recommendations is weak and does not meet the principles of intergenerational equity, relying on future generations to meet this challenge, given that this sector is responsible for around 50% of greenhouse gas emissions nationally<sup>33</sup>.

11.6 This report underestimates the level of positive change that can be achieved by the agricultural sector, which is occurring through exemplar farms throughout the country.

11.7 The CCC has missed an opportunity in proposing answers that build up carbon on New Zealand farms. Greater consideration of nature-based solutions (NbS) is required, detailed in section 8.

#### **Recommendation**

**R23 – That the advice for agriculture is fully revisited and the sector is provided with a leadership opportunity to demonstrate its ability to reduce emissions significantly.**

12.1 Wise Response supports Time Critical Necessary Action Five and Necessary Action 12, which seek to manage forests to provide a medium-term offset and contribute to inter-generational equity, for example the replanting of Coronet Forest<sup>34</sup>.

12.2 The introduction of permanent forest initiatives is welcome, as previous proposals for plantation forestry solutions were inadequate in the face of climate change mitigation and misdirected.

12.3 We recommend that further emphasis could be placed on the repurposing of plantation forestry toward other climate-conscious operations, such as for the development of timber-framed built developments.

12.4 Wise Response also recommended the NbS for forestry described in section 8.

#### **Recommendation**

**R24 – Further emphasis could be placed on the repurposing of plantation forestry toward other climate-conscious operations, such as for the development of timber-framed built developments.**

<sup>33</sup> Ministry for the Environment, 2020. New Zealand's Greenhouse Gas Inventory 1990 -2018.

<https://www.mfe.govt.nz/sites/default/files/media/Climate%20Change/new-zealands-greenhouse-gas-inventory-1990-2018-vol-1.pdf>

<sup>34</sup> <http://www.lakesenvironmental.co.nz/assets/Uploads/Council-Documents/Full-Council-Agendas/2017/17August-2017/4.-Adoption-of-Coronet-Forest-Management-Plan-2017-covering-report/4a.-Draft-Coronet-Forest-Management-Plan-2017.pdf>

13.3 NbS are discussed in section 834.

## 13 Coastal and Marine Ecosystems

13.1 The area New Zealand has jurisdiction over is around 4 million km<sup>2</sup>, with the land area of 268,000 km<sup>2</sup>. The lack of inclusion in the advice of both coastal and marine ecosystems are important omissions as these are biomes of importance in the carbon cycle.

13.2 Improved management of these marine habitats will help improve carbon sequestration.

## 14 Communication

14.1. Investment in a process is required using new and old techniques that are effective at persuading people, individuals, sector groups, and others on the magnitude of the climate crisis so as to have engagement for the mitigation process and inspire a desire for the vast majority of New Zealanders to be part of the solution. These techniques have been absent. Methods that will be used will differ for various groups and research needs to be consulted for the most suitable approaches.

# Appendix A: Background to the Wise Response Society Inc

## Purpose of Society

1. Wise Response is a Dunedin-based but New Zealand-wide, non-partisan Society, launched in 2013, with the purpose of persuading the New Zealand Parliament, Government and New Zealand society in general, to confront and respond effectively to any confirmed threats arising from the question: "As demand for growth exceeds earth's physical limits causing unprecedented risks, what knowledge and changes do we need to secure New Zealand's future wellbeing?"
2. In April 2014, we presented our 5,000-signature petition to Parliament, that recommended they undertake a Risk Assessment of New Zealand.
3. In October 2014, members Sir Alan Mark and Prof Peter Barrett presented a resolution to the Royal Society Fellows AGM, which resulted in the Society producing and publishing two commissioned reports in 2016, on the Implications and the Mitigation of Climate Change in New Zealand.
4. Another significant initiative was to hold two meetings in Wellington with about 25 NGOs, to facilitate development of a Position Statement and Action Plan on climate change, under the name Climate Consensus Coalition Aotearoa (CCCA). Given the political vacuum at the time, this was to propose a goal and process by which to develop a New Zealand Plan to give effect to the spirit and intent of the Paris Accord of Dec. 2015. The total of individuals and the membership of organizations which formally endorsed the CCCA numbered approximately 330,000 from about 100 organizations.
5. In August 2017 we made presentations of the CCCA Action Plan to MPs at Parliament, through GLOBE-NZ members (arranged and chaired by Dr Kennedy Graham) and an invited audience of all MPs in the Beehive Theatre.
6. Our Society also makes regular submission on a range of policy change issues. Examples include the Emissions Trading Scheme, the Resource Legislation Amendment Bill, Regional Policy Statement of the Otago Regional Council (and mediation with Dr Royden Somerville QC and Will Anglin as Counsel which has since been appealed to the Environment and High Courts), New Zealand Energy Efficiency and Conservation Strategy, the Productivity Commission, the Child Poverty Reduction Bill and the Tax Review Group, and most recently, the Zero Carbon Bill with particular focus on methane.
7. The Society also aims to raise climate change/environmental awareness through public meetings. In November 2017 we arranged a seminar on Integrated Landscape Management. In Jan. 2018, the Society held "Climate Change issues: from Bonn COP23 and Beyond", with Central and Local Government responses, addressed by the Hon James Shaw, Minister of Climate Change, Mr Dave Cull, President of Local Government New Zealand and Hon Clare Curran, MP for Dunedin South, with some 400 attendees. This has been followed by public meetings on "Tackling our Climate Emergency Head-On: Carbon Accounting" and "Impacts of the Mining/Minerals Industry", timed to coincide with the national Minerals Forum in Dunedin in May 2019.

8. In 2018 we participated in the National Science Challenge to report on "Transformation of land-based industries" and in Sept - Oct ran a 6-week course for U3A on the "Finding a Sustainable Transition Path to Zero Net Carbon Emissions for New Zealand".
9. We also host interns from the Otago University to undertake projects concerned with sustainability. Further information is available at our website: [www.wiseresponse.org.nz](http://www.wiseresponse.org.nz)