



A submission to the Ministry for the Environment on the INDC consultation document, 'New Zealand's Climate Change Target'

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Introduction

1. Some of the points I make in this submission do not fit neatly against the questions posed in the consultation document. This submission is accordingly structured around the following headings:
 - Overall trajectory
 - Expectations of New Zealand
 - Benefits and costs of mitigation
 - A milestone target
 - Urgency.
2. A proposed INDC (intended nationally determined contribution) for the New Zealand government to take to the Paris talks needs to be motivated by an overall intended trajectory for New Zealand for the rest of this century. At present the Government is in my view constrained by its own '50% by 2050' commitment, which needs reappraisal.² But a clear view of a strategy for New Zealand in the forthcoming talks needs to consider further critical issues which are not adequately canvassed in the consultation document:
 - New Zealand's projected stock of internationally traded carbon credits, including credits from earlier commitment periods
 - The use of such credits and the matter of 'supplementarity'³
 - A strategy for forest sequestration (and hence the availability of sink credits).
3. If the Government is to fully engage the informed public in productive consultation on its stance for Paris, a greater degree of transparency and discussion on such issues is important. A wider benefit of such informed debate is that it would also help to create a two-way education process between the public and the government about this complex but vital issue.

¹ Disclaimer: this is a personal submission and does not necessarily represent the views of Victoria University of Wellington. Information on the submitter is available at the end of this submission.

² Chapman, R., & Boston, J. (2011). 'Gazetting New Zealand's 2050 Emissions Target': Submission on New Zealand's 2050 greenhouse gas emissions target. Wellington: Victoria University of Wellington

³ That is, the balance, in making a contribution, between domestic emission reduction and ('supplementally') the use of international carbon credits. Decisions on this need to consider the intent of the Marrakesh accords.

Overall trajectory: how fast should global emissions be reduced?

4. It is often stated that the world needs to stay within a carbon budget consistent with *at least* a 67% (two in three) chance of global warming of less than 2 degrees Celsius. This means that the world needs to aim to reduce its carbon dioxide emissions to **around zero** by around **2060** or 2070 or find a transition path that is less precipitous but yields the same result. The global community should act in a prudent manner and not place significant reliance on an overshoot scenario with carbon capture and storage or 'BECCS' (bioenergy with carbon capture and storage) as the technologies are very risky at this stage.
5. For many, however, the risk of 1 in 3 of going over 2 degrees C of global warming is too high. We can compare this with other risks which we pay substantial sums to insure against, such as house fires or earthquakes. Socially acceptable risk levels in respect of those hazards are much lower. There is no evident and compelling reason why the New Zealand community and government should accept a 1 in 3 risk of exceeding 2 degrees C – i.e. why they should accept a substantial risk of unmanageable climate change. The community's response is no doubt assumed to be 'accepting' in the absence of widespread understanding of the risks involved, but the public is not well informed about these risks. Therefore, it is imperative that policies adopted in the public interest should err on the cautious side and aim to minimise risks of extreme change.
6. A vital role for public policy is to avert system crisis or collapse. Economists Wagner and Weitzman put this succinctly in their 2015 book, *Climate Shock*, reviewed by the climate change economist William Nordhaus of Yale as follows:

‘They [Wagner and Weitzman] argue that current policies are leading to a substantial chance (perhaps one in ten) that global temperatures will eventually rise by at least six degrees C. This will, in their words, be “the end of the human adventure on this planet as we now know it.” Policies should above all aim to cut off the possibility, the tail, of catastrophic temperature increases.’⁴

The implication is that globally, and also in New Zealand, more needs to be done to reduce these 'fat tail risks'. It is unethical for the present generation to impose such extreme risks of future generations.

Expectations of New Zealand

7. Turning to New Zealand's 'target', New Zealand needs to do more than 'the world average' in abating emissions, as it is a relatively prosperous developed country, with considerable capacity to act to reduce emissions. Moreover, New Zealand has a high dependence on a stable multilateral world order, and needs to be seen to be a cooperative player. Lastly, New Zealand is also quite vulnerable to climate change.

⁴ Nordhaus, W. (2015) A New Solution: The Climate Club. New York Review of Books, 4 June,

8. Some time ago, the UNFCCC noted that developed countries such as New Zealand should take on emission reduction goals of the order of 80-95% (below 1990 levels) by 2050.⁵ This provides an overall guideline of expectations for New Zealand. In addition, New Zealand will be expected to be more ambitious for 2030 than the ‘-5%’ (i.e. 5% below 1990 levels) unconditional goal it has adopted for 2020. In effect – and this has implications for cost estimation – New Zealand’s INDC *baseline* is the -5% level of emissions. A commitment significantly more ambitious than -5% for 2030 will be necessary on the grounds of the need for a downward emissions trajectory, and on the basis of differentiated responsibility and capability (in UNFCCC language).⁶

Benefits and costs of mitigation

9. It is also to New Zealand’s broader economic as well as environmental benefit to treat seriously and urgently the transition to a zero carbon economy. The first and most compelling reason is that it will be lower-cost and higher-benefit for New Zealand to begin making the inevitable transition now, as opposed to later. Delay is very costly, as recent evidence from the White House underlines.⁷
10. Secondly, there are self-interest arguments in moving. As an OECD review of New Zealand’s climate policy recently stated:

‘By taking its international obligations seriously, notably under the Kyoto Protocol, [New Zealand] stands to gain a place at the table when accounting rules for the treatment of forestry and agriculture, which concern New Zealand’s emissions profile acutely, are discussed.’⁸

11. In terms of direct costs, the most fundamental point is that it is clear from the Infometrics analysis that the estimated direct cost of active mitigation (e.g. for a target of -40% by 2030) pales beside the sheer scale of income (or RGNDI) growth between now and 2030. Infometrics’ report mentions an income loss of around 1.2% for a -10% target, and -1.6% for a -40% target, but these will almost certainly be overestimates of cost for a number of reasons. These include the lack of adjustment possibilities in the model (e.g. no allowance is made for widespread electric vehicle or battery technology changes, and in general, there is an assumption of ‘no “disruptive” technological

⁵ The UNFCCC suggested in 2007 that Annex 1 countries such as New Zealand should, for a 450ppm CO₂e target, aim for 80-95% emission reductions relative to 1990, by 2050. See UNFCCC. (2007). Synthesis of information relevant to the determination of the mitigation potential and to the identification of possible ranges of emission reduction objectives of Annex I Parties: FCCC/TP/2007/1: UNFCCC; Table 4.

⁶ <http://unfccc.int/resource/docs/2007/tp/01.pdf>.

⁷ US Council of Economic Advisers. (2014). The Cost of Delaying Action to Stem Climate Change. Retrieved from http://www.whitehouse.gov/sites/default/files/docs/the_cost_of_delaying_action_to_stem_climate_change.pdf

⁸ Bibbee, A. (2011) Green growth and climate change policies in New Zealand. Paris, OECD,

changes⁹).

12. The general finding of low relative cost is consistent with a range of findings that economists have reached since the time of the 2006 Stern Review. It has been recently reinforced by an analysis of integrated assessment models of the potential and cost of energy system transformation.¹⁰ The proposition that a developed economy such as New Zealand's cannot 'afford' to cut emissions substantially, and move onto a zero carbon transition path, is clearly untenable given (a) the relatively low cost of substantial mitigation, in relation to incomes; and (b) the magnitude of the potential damages from inadequate mitigation.
13. The overall analysis of costs and other considerations offered by the consultation document is inadequate. The document touches on some areas of potential, such as transport, but is very light in its analysis. It does not begin to consider the full range of co-benefits (discussed further below) of rapid mitigation in these or other sectors, let alone the impacts of *not* mitigating adequately. In addition to the assumptions mentioned in the last paragraph, a number of challengeable assumptions such as those concerning the forestry sector 'accounting settings'¹¹ made in the modelling have been discussed publicly, and there is doubt about their merit.
14. One of the most egregious is the assumption that because New Zealand has attained a level of around 80% renewable electricity generation, a limit has already been reached. Costs of moving to 100% renewable electricity are not demonstrated to be either high or prohibitive. With some electricity market redesign and rapid penetration of solar PV, further wind and geothermal, New Zealand could reach 100% (or so) renewable electricity.¹² In the longer term, 100% zero-carbon energy may be possible. Targets in both cases would be helpful as motivators of change.
15. In assessing the potential to reduce emissions, a considerable amount – but by no means everything – will turn on the carbon price. New Zealand's ETS is now an international embarrassment, operating at ineffectual price levels, and with arrangements (such as the 'one for two' surrender obligation and the total exemption of agricultural GHGs) that undermine remaining impact. The price of carbon should approximate the social cost of carbon. There is no adequate analysis of the social cost of

⁹ Infometrics. (2015). A General Equilibrium Analysis of Options for New Zealand's post-2020 Climate Change Contribution. Wellington: Infometrics; p.11.

¹⁰ Rogelj, J., Luderer, G., Pietzcker, R. C., Kriegler, E., Schaeffer, M., Krey, V., et al. (2015). Energy system transformations for limiting end-of-century warming to below 1.5 [deg]C. [Perspective]. Nature Clim. Change, 5(6), 519-527

¹¹ See Infometrics. (2015). A General Equilibrium Analysis of Options for New Zealand's post-2020 Climate Change Contribution. Wellington: Infometrics; p.5.

¹² Mason, I. G., Page, S. C., & Williamson, A. G. (2010). A 100% renewable electricity generation system for New Zealand utilising hydro, wind, geothermal and biomass resources. Energy Policy, 38, 3973-3984

carbon (SCC) in the consultation document but figures for a carbon price of NZ\$60-200 per tonne by 2030 are referred to. There is an emerging international consensus¹³ that the SCC is at least around such levels¹⁴, certainly well above New Zealand's current ETS price. One recent review of the SCC literature suggests, for example:

'...SCC values below [US] \$125 are unrealistic if one does not adopt a very high discount rate and allows for large (uncertain) climate change impacts and risk aversion, while much higher values are defensible if one adopts precautionary type of approaches...'¹⁵

16. Given the importance of a carbon price, and the findings on the social cost of carbon, it is imperative that the ETS be reviewed alongside the presentation of New Zealand's INDC, to create more realistic and much sharper incentives on New Zealand emitters. Moreover, if an ETS is to be retained, a price floor such as NZ\$50 per tonne initially but rising, together with a price ceiling, should be introduced, to provide greater certainty to the business sector, and clearer incentives for the forestry sector. Such steps would go a long way to inducing low-cost behaviour change and investment decisions to adopt lower carbon technologies.
17. The consultation document did mention certain co-benefits, but it also placed much more weight on the cost modelling than is warranted given the potential importance of co-benefits.¹⁶ Unmodelled co-benefits of mitigation include the expected positive spinoffs of emission reduction in the land transport domain through uptake of electric vehicles, encouragement of public transport and active transport, and conversion of freight transport to biofuels. Another example of co-benefits is the health gains from residential insulation, which have been estimated to be several times greater than the costs of retrofitting insulation.¹⁷

A milestone target

18. In the absence of a comprehensive mitigation assessment, it is only possible to base judgments about milestone targets on broad considerations including but not limited to the relatively small cost (compared to income growth) of projected mitigation, New Zealand's international reputation, the ecological and economic importance of rapid

¹³ See for example Dietz, S., & Stern, N. (2014). Endogenous growth, convexity of damages and climate risk: how Nordhaus' framework supports deep cuts in carbon emissions. Working Paper No. 180 London: Centre for Climate Change Economics and Policy <http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2014/06/Working-Paper-180-Dietz-and-Stern-2014.pdf> ; Moore, F. C., & Diaz, D. B. (2015). Temperature impacts on economic growth warrant stringent mitigation policy. *Nature Climate Change*

¹⁴ Howard, P. (2014). Omitted Damages: What's Missing from the Social Cost of Carbon. n.s.: EDF, Institute for Policy Integrity, NRDC

¹⁵ van den Bergh, J. C. J. M., et al. (2015) Monetary valuation of the social cost of CO2 emissions: A critical survey. *Ecological Economics*,114, 0, 33-46.

¹⁶ Ürge-Vorsatz, D., Herrero, S. T., Dubash, N. K., & Lecocq, F. (2014). Measuring the Co-Benefits of Climate Change Mitigation. *Annual Review of Environment and Resources*, 39, 549-582

¹⁷ Howden-Chapman, P., et al. (2012) Health co-benefits from housing-related policies. *Current Opinion in Environmental Sustainability*,4, 4, 414-419.

mitigation, and the ethical imperative to act expeditiously and with precaution.

19. Taking into account these broad considerations, a reasonable interim goal would be to move New Zealand onto a path to cut emissions to nearly zero by around 2050. In terms of this trajectory, **40% reductions by 2030** represents a reasonable milestone.

Urgency

20. Time is running out in terms of managing a carbon budget consistent with global warming of no more than 2 degrees C. It may well be that the chances of holding warming to under 2C are now small, but all efforts should focus on this goal, and minimising the enormous risks of global warming going beyond 2 C.
21. New Zealand needs to take wise, far-sighted decisions on rapid action, before it loses the capacity to act rationally, in the face of mounting climate damage and intense international pressure. As President Obama stated in his 2014 speech at the Climate Summit in New York, “We are the first generation to feel the impact of climate change and the last generation that can do something about it.”¹⁸

I am happy to present and discuss the views set out in this submission should there be an opportunity to do so.

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About the submitter:

Associate Professor Ralph Chapman directs the Graduate Programme in Environmental Studies at Victoria University of Wellington. He is an ecological economist who has worked on a range of climate change-related policy issues – transport, energy, housing, and urban design. He has also worked with the New Zealand Ministry for the Environment, the NZ Treasury; the British Treasury in Whitehall; the OECD, in the Wellington ‘Beehive’, and as a negotiator for New Zealand of the Kyoto Protocol. Ralph has first class honours in engineering, a Master’s in public policy, and a PhD in economics. He is also part of a team which won the NZ Prime Minister’s Science Prize in 2014.

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¹⁸ <http://www.whitehouse.gov/blog/2>