



# Submissions form

We seek your feedback on the specific proposals in the Zero Carbon Bill.

Either email this submission to [ZCB.Submissions@mfe.govt.nz](mailto:ZCB.Submissions@mfe.govt.nz) (Microsoft Word document (2003 or later) or PDF) or post to Ministry for the Environment, PO Box 10362, Wellington, 6143.

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## Personal / organisation details

*You must provide either a company name or given name(s)*

Company name: Centre for Energy Research, Massey University

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Surname: Sims

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Submitter type, pick one:

**X Individual**

Professor of Sustainable Energy, Massey University, Co-ordinating Lead Author of 3 IPCC report chapters, Chair of Royal Society of NZ Climate change mitigation panel (2015/16) and Member of Scientific and Technology Advisory Panel of the Global Environment Facility, for climate change mitigation.

## 2050 target

1. What process should the Government use to set a new emissions reduction target in legislation?

Pick one:

**X the Government sets a 2050 target in legislation now**

- the Government sets a goal to reach net zero emissions by the second half of the century, and the Climate Change Commission advises on the specific target for the Government to set later.

**We need certainty and urgency – supported by a cross-party agreement on the target. An ambitious target is essential.**

**The Climate Change Commission should provide advice on the theory of change (the pathways) that NZ will need to take (at least for three 5 year periods in advance) in order to reach this set target.**

2. If the Government sets a 2050 target now, which is the best target for New Zealand?

Pick one:

- net zero carbon dioxide:** Reducing net carbon dioxide emissions to zero by 2050
- net zero long-lived gases and stabilised short-lived gases:** Long-lived gases to net zero by 2050, while also stabilising short-lived gases

**X net zero emissions: Net zero emissions across all greenhouse gases by 2050.**

**To stay below 2°C all gases must be reduced globally from present emission levels. NZ is not an exception and must play its part – especially since our emissions per capita are relatively high.**

**There could be different approaches within the Zero Carbon Act for short- and long-lived gases (a two basket approach), but it needs to be realised that for the planet to achieve net zero emissions by around mid-century in order to stabilise below 2°C temperature rise above pre-industrial levels all gases must be reduced. (Given the current global trends and lack of commitments, in my view it is too late to stay below 1.5°C).**

**Stabilizing global mean temperature increase at any level requires global CO<sub>2</sub>**

emissions to become net zero at some point in the future (Collins et al., 2013). The residual warming of short-lived emissions must also be limited by reducing their annual emissions.

In NZ, as elsewhere, early emphasis should be on reducing domestic CO<sub>2</sub> emissions and to a lesser degree, N<sub>2</sub>O.

However, flows of short-lived CH<sub>4</sub>, black carbon and other short-lived gases also need to be reduced over time, at least to a level that could be offset in future. This would be by removals of CO<sub>2</sub> from the atmosphere that are equivalent to the short-lived climate forcers based on their global warming potentials. Removals could be, for example, by forest sinks and maybe CO<sub>2</sub> capture and sequestration if it becomes a viable technology, or perhaps by conversion of CO<sub>2</sub> to hydrocarbons in the long term.

Scenarios show a reduction in global CH<sub>4</sub> is needed by 2030 and deeper cuts by 2050 (Rao et al., 2016, 2017). Most 2°C mitigation pathways show a reduction in CH<sub>4</sub> and black carbon is needed as much as possible, although not necessarily immediately.

To avoid overshoot implies deeper reduction of CO<sub>2</sub> and non-CO<sub>2</sub> warming forcers in order to stay within the CO<sub>2</sub> threshold peak budget. The lowest possible level of non-CO<sub>2</sub> warming is essential at the time of the peak.

Collins, M., Knutti, R., Arblaster, J., Dufresne, J.-L., Fichet, T., Friedlingstein, P., et al. (2013). "Long-term Climate Change: Projections, Commitments and Irreversibility," in *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Eds. T. F. Stocker, D. Qin, G.-K. Plattner, M. Tignor, S. K. Allen, J. Boschung, et al., 1029–1136. doi:10.1017/CBO9781107415324.024

Rao, S., Klimont, Z., Leitao, J., Riahi, K., van Dingenen, R., Reis, L. A., et al. (2016). A multi-model assessment of the co-benefits of climate mitigation for global air quality. *Environmental Research Letters* 11, 124013. doi:10.1088/1748-9326/11/12/124013.

Rao, S., Klimont, Z., Smith, S. J., Van Dingenen, R., Dentener, F., Bouwman, L., et al. (2017). Future air pollution in the Shared Socio-economic Pathways. *Global Environmental Change* 42, 346–358. doi:10.1016/j.gloenvcha.2016.05.012.

**Globally the food supply system uses around one third of end-use energy and produces almost one quarter of total greenhouse gases.** <http://www.stagef.org/future-food-system-healthy-human-beings-and-healthy-planet> The agriculture sector therefore has to play its part and cannot be exempted if the Paris Agreement targets are likely to be met. So the New Zealand agriculture sector has to reduce emissions along with all other sectors.

**Notes:**

- a) Forest sinks can only provide temporary solutions and should be treated as such.
- b) CH<sub>4</sub> in the atmosphere is converted naturally to CO<sub>2</sub> over a decade or two. If the CH<sub>4</sub> is from biological sources, then it can be argued the resulting CO<sub>2</sub> is carbon neutral as it will be reabsorbed by rice or pasture plants. If the CH<sub>4</sub> is from fossil origins (such as natural gas leakages during extraction or distribution for example) then the resulting CO<sub>2</sub> appearing in the atmosphere is no different as a climate forcer than CO<sub>2</sub> arising from the combustion of fossil fuels. Therefore if there is a basket of gases within the ZCB, the various CH<sub>4</sub> sources need to be treated

separately.

**c) Moving closer to a 2°C temperature rise is inevitable and so will involve costly levels of adaptation (even more so when rising above 2°C) in order to become more resilient to climate-related impacts. This is not yet particularly well understood in NZ, and hence a reason why adaptation should be included within the work of the Commission.**

3. How should New Zealand meet its targets?

Pick one:

**domestic emissions reductions only (including from new forest planting)**

- domestic emissions reductions (including from new forest planting) and using some emissions reductions from overseas (international carbon units) that have strong environmental safeguards.

**C credits purchased off-shore are only providing a temporary option to “buy some time” before domestic emissions will have to be reduced. Credits are likely to be far more costly per tonne of CO<sub>2</sub> avoided in the medium to long term than undertaking domestic emissions reductions given that virtually all countries are aiming to meet their nationally determined contributions under the Paris Agreement, so few surplus credits will be available.**

4. Should the Zero Carbon Bill allow the 2050 target to be revised if circumstances change?

Pick one:

**yes**

- no.

**But only to make it more ambitious under exceptional circumstances such as the rapid and unpredicted commercial development of future low C technologies / systems, or our international obligations becoming more stringent (possibly as future extreme climate impacts become more evident and urgency increases).**

## Emissions budgets

5. The Government proposes that three emissions budgets of five years each (ie, covering the next 15 years) be in place at any given time. Do you agree with this proposal?

Pick one:

yes

no.

**The NZ Climate Change Commission should be charged with providing rolling targets that are at least 15 years into the future.**

**This is a similar strategy as employed under the successful UK Climate Change Act which is a model that can be followed here. The 5 yearly budgets also need to inform the NZ NDC process as the Paris Agreement becomes more ambitious in reducing emissions over time.**

**Linking the budgets with 3 year election cycles has been proposed by some, but given there will need to be a cross-party agreement, this link is irrelevant.**

6. Should the Government be able to alter the last emissions budget (ie, furthest into the future)?

Pick one:

yes, each incoming Government should have the option to review the third budget in the sequence

yes, the third emissions budget should be able to be changed, but only when the subsequent budget is set

no, emissions budgets should not be able to be changed.

**Can be changed **only to make it more ambitious** due to changes in international agreements and/or more rapid development and uptake of one or more climate technologies than could have been anticipated when the budget was first set more than a decade previously.**

**The accelerating rate of technology change and novel entities that can help reduce negative impacts on environmental degradation should not be underestimated.**

7. Should the Government have the ability to review and adjust the second emissions budget within a specific range under **exceptional circumstances**?

Pick one:

yes

no.

**BUT only to make it **more ambitious** if national or global circumstances require greater urgency than was foreseen when the second emissions budget was set.**

8. Do you agree with the [considerations](#) we propose that the Government and the Climate Change Commission take into account when advising on and setting budgets?

Pick one:

- X yes
- no.

The proposed considerations when setting or advising on budgets are sound. However, they are unlikely to have included all eventualities as some will inevitably arise during the process as it evolves. Therefore, some amendments and additions may be necessary. The key is to maintain the over-arching objectives of cost-effective, equity and sustainability in the transition pathway as identified through the successive budgets.

Missing from recent NZIER and other cost analyses is **the valuing of the range of co-benefits resulting from climate mitigation actions.** This is giving an imbalance to the assumed costs of mitigation in the public arena as presented by both the Ministry for Environment and politicians. This gives the misleading impression to the general public that climate mitigation measures are more expensive than they possibly will be in reality. A systems thinking approach should be undertaken so that all the co-benefits (health bills, traffic congestion, employment opportunities etc.) can be valued and included.

It is suggested that to meet this goal, some detailed cost-benefit modelling should be urgently undertaken to provide greater understanding for the general public as well as be of use by the Climate Change Commission in their challenging task.

## Government response

9. Should the Zero Carbon Bill require Governments to set out plans within a certain timeframe to achieve the emissions budgets?

Pick one:

- X yes
- no.

**Setting budgets and targets is relatively easy. Early assessments and clear statements from Government of exactly **how** we are going to meet them, coupled with an outline of the appropriate policy measures, societal changes, costs and benefits, will be critical.**

10. What are the most important issues for the Government to consider in setting plans to meet budgets? For example, who do we need to work with, what else needs to be considered?

**As a result of the proposed GHG budgets, the resulting climate change mitigation measures and climate-related impacts will inevitably disadvantage some communities/ industries / urban settlements / socio-economic groups, more than others. Even though the climate change problem has been apparent for decades, businesses, cities, municipalities and communities are only just starting to accept the threat and only slowly beginning to understand the potential risks involved from inaction. So wide consultation is essential to explain the issues – from the Prime-Minister down.**

**There is some recent evidence of a slowly growing reality by businesses and local governments that change is inevitable if we are to reduce our GHGs to acceptable levels along the pathway to reach net zero emissions by 2050 (e.g. by the Climate Leaders Coalition, Federated Farmers, the oil/gas industry, Local Government NZ etc).**

**The possible societal and economic impacts that will inevitably occur on some groups/sectors/industries should be identified at an early stage of the process to avoid poor investments in the future leading to stranded assets. Those most vulnerable should be made aware of the key scientific messages and the risks involved through continuing the consultation across all sectors and levels of society.**

## **Climate Change Commission**

11. The Government has proposed that the Climate Change Commission **advises on and monitors** New Zealand's progress towards its goals. Do you agree with these functions?

Pick one:

**yes**

no.

**The main role of the Commission will be to provide advice to Parliament (rather than Government given that cross-party agreement is essential).**

**Monitoring progress as a result of the advice given is therefore a logical approach. The Commission should also provide independent feedback to Parliament on the rate of mitigation progress and any changes in status of climate technologies. As part of the monitoring role, it should also review introduced policies to assess their potential for successful reduction of emissions – or otherwise.**

**The Commission's role is NOT one of decision making. It should, however, be placed in a position to hold the Government to account if emissions reductions are not reaching the targeted budgets for whatever reason.**

12. What role do you think the Climate Change Commission should have in relation to the New Zealand Emissions Trading Scheme (NZ ETS)?

Pick one:

**advising the Government on policy settings in the NZ ETS**

makes decisions itself, in respect of the number of units available in the NZ ETS.

**As above, the Commission should be an independent advisory body. So it should not be charged with making any decisions with regard to the ETS.**

13. The Government has proposed that Climate Change Commissioners need to have a range of **essential and desirable expertise**. Do you agree with the proposed expertise?

Pick one:

yes

no.

**Members of the Commission should be selected from those with a broad knowledge of the issues, but who also have specific experience in one or more areas including emissions trading, business management, low-carbon transport and energy systems, urban planning, food supply systems, social science, etc.**

**Collectively the members should be charged with advising on the budgets and monitoring progress along the identified pathway. The UK Climate Committee provides a good model of the range of expertise required, though perhaps too little representation of business was apparent, being mainly selected from academics initially.**

**Guidance for NZ membership with the required range of expertise could also be based on the breakdown of chapters in IPCC Mitigation reports. The wide range of necessary expertise required when selecting authors**



has been given considerable thought. For example, based on the chapters, expertise would include the technology sectors (energy, transport, buildings, industry, land use), risk and uncertainty, human settlements, social and ethical concepts, policies, investments and finance.

The list of expertise outlined in the ZCB discussion document includes a fair range but could be broadened. a) It is important that a social scientist is included due to need for behavioural change. b) A good understanding of rapidly evolving new and novel technologies and systems with mitigation potential from the NZ perspective should also be sought as at present, it seems to be under-represented. c) Local government should be represented in the adaptation sub-group (see below).

## Adapting to the impacts of climate change

14. Do you think the Zero Carbon Bill should cover adapting to climate change?

Pick one:

yes

no

Having a sub-group of the Commission that covers adaptation measures (including understanding health, food, water, biodiversity) and works in parallel to the main Commission is recommended because mitigation will be a major challenge for the main Commission body in itself. However, the linkages between mitigation and adaptation must be addressed.

15. The Government has proposed a number of new [functions](#) to help us adapt to climate change. Do you agree with the proposed functions?

Pick one:

yes

no.

A national climate risk assessment and a policy plan to address these risks is essential for communicating to the wider public. See point 10 above.



16. Should we explore setting up a targeted adaptation reporting power that could see **some organisations** share information on their exposure to climate change risks?

Pick one:

**yes**

no.

**Yes in principle, but which organisations specifically will need identifying?**

**In essence ALL sectors are exposed to climate risks – so why only “some organisations”? All organisations that currently produce some form of annual report should be mandated to include a section on climate risks and what is being done or planned to offset them.**

**This would also provide another means of publicising the severity of the issue and help promote the message that every New Zealand citizen will be affected one way or another so that everyone will need to take action to reduce their personal carbon footprints. It is not a problem just for the Government to solve alone.**