

15 November 2019

**To:**

Interim Climate Change Committee  
c/o Ministry for the Environment,  
PO Box 10362,  
Wellington 6143

Email: [feedback@ICCC.mfe.govt.nz](mailto:feedback@ICCC.mfe.govt.nz).

## Response to Call for evidence on Options available to reduce greenhouse gas emissions over the period 2022-2035

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# Call for evidence



We are calling for evidence on options available to reduce greenhouse gas emissions over the period 2022 to 2035.

### Why are we doing this?

The Interim Climate Change Committee is the precursor to the proposed Climate Change Commission, expected to be established in late 2019 under the Zero Carbon Bill<sup>4</sup>. The Bill provides a framework to help New Zealand deliver on the objectives of the Paris Agreement.

A key part of the proposed Commission's work will be to advise the Government on emissions budgets.

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<sup>4</sup> Climate Change Response (Zero Carbon) Amendment Bill:

<http://www.legislation.govt.nz/bill/government/2019/0136/latest/LMS183736.html>.

Emissions budgets set the total emissions of all greenhouse gases permitted in the relevant budget period. The Government will set emissions budgets based on the proposed Commission's advice.

### **Why are we doing this now?**

We are running this call for evidence now as foundation work for the proposed Climate Change Commission to enable it to start work immediately as soon as it is set up.

It will help identify relevant information for developing these emissions budgets, and to maintain a broad, robust and transparent approach in developing the proposed Commission's evidence base.

We have been asked to do this through our [Terms of Reference](#). This work is also outlined in our letter to the Minister for Climate Change on 7 May 2019 [here](#).

### **What are we looking for?**

We are looking for high-quality, credible, evidence that will support the proposed Commission's work on emissions budgets. This is likely to include knowledge and evidence of technologies and options to reduce emissions, and the economic, environmental, cultural and social impacts of them. We are not looking for personal views or opinions.

### **What if I have already made submissions on similar topics?**

If you have already submitted evidence as part of consultation run by Government agencies, such as the Zero Carbon Bill or the Ministry of Transport's Clean Car Standard and Discount, then we are happy for you to point us to those submissions, noting the key information or material that relates to our call for evidence.

### **Call for evidence: response form**

We are looking for responses that are evidence-based, with data and references included where possible. Please limit your response to each question to a maximum of 400 words, plus links to supporting evidence, using the template provided. Please answer only those questions where you have particular expertise or experience.

We recommend that you refer to the Climate Change Response (Zero Carbon) Amendment Bill when considering your answers, which can be found [here](#).

If you have any questions about completing the call for evidence, please contact us via [feedback@ICCC.mfe.govt.nz](mailto:feedback@ICCC.mfe.govt.nz). Please include a contact number in case we need to talk to you about your query.

Please email your completed form by **12 noon, Friday 15 November 2019** to [feedback@ICCC.mfe.govt.nz](mailto:feedback@ICCC.mfe.govt.nz). We may follow up for more detail where appropriate.

## Contact details

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|---------------------------------|--|
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## Submissions on similar topics

**Please indicate any other submissions you have made on relevant topics, noting the particular material or information you think we should be aware of.**

*Answer:*

We have made many submissions touching on climate change, to various government agencies. We note here several relevant points from [three] recent submissions from the Centre for Sustainable Cities to MfE/Parliament/ MOT:

**1) Chapman, R. and Howden-Chapman, P. (2019) Submission to the Ministry for the Environment on a National Policy Statement on Urban Development. Wellington: New Zealand Centre for Sustainable Cities.**

Main points:

- The NPS proposal is framed mainly around growth, particularly ‘making room for urban growth’. ...in our view, the NPS should be more clearly framed around the high level goals of wellbeing and sustainability, and in particular, environmental sustainability, which means giving high priority to mitigating and, secondarily, adapting to climate change. Climate change is mentioned but under-emphasised in the NPS. It is acknowledged that the RMA at present largely excludes mitigation from RMA decision making, other than considering the *effects* of climate change, following the 2004 amendment to the RMA; however, we also note that this could well change in the second round of RMA reforms that Minister Parker may introduce. The NPS should be written to provide maximum congruence with this expected change. Climate change mitigation should meanwhile be given more attention and prominence in this NPS, and not be seen just as a nice-to-have complement to liveability (p.13).

- A central goal of maximising wellbeing – consistent with the wellbeing approach set out in the 2019 Budget (Robertson, 2019) -- necessitates paying attention to the quality of the urban environment through means such as provision of sufficient and high quality green space, provision for sustainable transport, improving (or maintaining) air and water quality, limiting noise, and other factors which directly influence wellbeing, including health. Providing for economic prosperity through employment and growth, and providing for various social outcomes such as safe communities, should in our view sit alongside but *not* be considered more important than the environmental determinants of wellbeing. The NPS should in our view be reworded to de-emphasise the priority it places on economic outcomes, especially growth. At present, wellbeing is seen as shaping the sort of growth we have (e.g. 'It [the NPS] aims to enable growth.... [and] will ensure growth is strategically planned and leads to well-functioning cities that contribute positively to people's well-being' (p.8)). We believe the framing should be reoriented, with a clear statement that the NPS primarily aims to enable wellbeing and sustainability, and that any growth must conform to these goals.
- The NPS provides no adequate basis for its assertion that the outward spread of NZ cities is needed. By contrast, the NZ Centre for Sustainable Cities has argued in various submissions that upward development is more efficient and sustainable than outward development, on the basis of international experience. Just one good example of the international evidence is from North America (Lee & Lee, 2014). For instance, they conclude:

'Given that household travel and residential energy use account for 42% of total U.S. carbon dioxide emissions, our research findings corroborate that urban land use and transportation policies to build *more compact cities* should play a crucial part of any strategic efforts to mitigate GHG emissions and stabilize climate at all levels of government.' (p. 548; emphasis added).

**2) Chapman, R., Howden-Chapman, P., Randal, E., & Ombler, J. (2019). *Submission to the Environment Select Committee on the Climate Change Response (Zero Carbon) Amendment Bill*. Wellington: New Zealand Centre for Sustainable Cities.**

The following point has *not* been obviated by the passage of the 'Zero Carbon' Act:

- Local government has the potential to contribute substantially to both adaptation and mitigation of climate change. However, there is little in the Bill which appears to relate to the responsibility of local government to design and implement mitigation measures, and report to the Commission on these actions. For example, local government will need to play an important role in designing policies and regulation that can contribute to mitigation, through mechanisms such as spatial plans and transport policies that can significantly influence carbon emissions from the building and transport sectors over time. We would like to see explicit attention being given to these matters in the Bill.

**3) Shaw, C., N. Wilson, P. Howden-Chapman, E. Randal, R. Chapman, R. Edwards, M. Keall, et al. *Submission on Draft Government Policy Statement on Land Transport: 2018/19 - 2027/28*. NZ Centre for Sustainable Cities (Wellington: 2018).**

Main points from this document<sup>5</sup> which are still relevant:

- The inclusion of health and the environment as high level objectives in the strategy will be particularly important when decisions are made that require trade-offs between various objectives. For example, emphasising EV take-up without an accompanying strategy to reduce car ownership, increase active transport modes and public transport use will fail to achieve the maximum health gains that could be achieved. Biofuel uptake may worsen air pollution and cause health harm, including high-level health and environmental objectives will require these trade-offs to be explicitly considered and managed.
- The identification of land use as a key determinant of transport demand is welcome; this is key to decoupling access and mobility (R Chapman, 2018). However, further work needs to be done aligning the legislative and policy framework of land transport planning with the other legislation that governs urban planning. The different aims and processes of the Local Government Act, Resource Management Act and Land Transport Management Act do not provide the aligned approach needed to develop resilient, liveable and low carbon cities with sustainable and environmentally friendly transport systems.

### Commercially sensitive information

***Do you have any objection to the release of any information contained in your response, including commercially sensitive information?***

***If yes, which part(s) do you consider should be withheld, together with the reason(s) for withholding this information.***

***Answer:***

No objection.

### Questions for consideration:

#### Section A The first three emissions budgets

Under the proposed Zero Carbon Bill, the proposed Commission will have to provide advice to government on the levels of emissions budgets over the coming decades.

Currently, the Zero Carbon Bill requires budgets to be set from 2022-2035 (three separate budgets covering 2022-2025, 2026-2030, and 2031-2035). When preparing this advice the proposed Commission will have to consider the implications of those budgets for meeting the

<sup>5</sup> Shaw, C., et al. (2018): <http://sustainablecities.org.nz/wp-content/uploads/Shaw..Chapman...-et-al-Apr18-NZCSC-Submission-on-Draft-GPS-2018.pdf>

2050 target. The Commission will also need to consider the likely economic effects (positive and negative) of its advice.

**Question 1:**

***In your area of expertise or experience, what are the specific proven and emerging options to reduce emissions to 2035? What are the likely costs, benefits and wider impacts of these options? Please provide evidence and/or data to support your assessment.***

**Answer**

First, we assume ‘costs, benefits and wider impacts’ is meant to include co-benefits (positive or negative). Our work suggests that co-benefits such as benefits for health can dominate CBA assessments, if appropriately analysed (**R. Chapman et al., 2018**). Omitting such co-benefits is also not consistent with the intent of the well-being framework adopted in the 2019 Budget (**Philippa Howden-Chapman, Keall, Whitwell, & Chapman, 2020**).

Having said this, here are several key points about options in two sectors, transport and residential energy use:

**1) *Transport and urban form: ‘avoid, shift and improve’ strategies***

Transportation has been the fastest growing (major) source of greenhouse emissions in New Zealand since 1990 (growing over 90%), and transport emissions have failed to decline in the last decade. Underlying growth in vehicle ownership is of concern, given that New Zealand has the highest ownership in the OECD. The 2018 Government Policy Statement on Land Transport and the MoT’s 2019 Transport Outcomes Framework have begun a strategic re-orientation which can be expected to make a significant difference to the shape of transportation systems and urban development over time, bringing down carbon emissions from land transport (if not air travel). Over the period of the critical three decades to 2050, we suspect the most important group of measures will be those which encourage cities to be more compact than otherwise, and with greater mixing of land use, thus avoiding unnecessary trips or limiting travel. There is a wealth of evidence (some reviewed recently by the NZ Productivity Commission) that more compact urban development can reduce emissions (see reference to Lee and Lee (2014) above).

While some emission reductions can be expected from these ‘Avoid’ options in the short run (the first three budget periods, to 2035), the bulk of the emission reductions could be expected in the latter half of the period to 2050. In the short-run, to 2035, bigger gains could be expected through mode shifting (following development of active travel and public transport), and through vehicle fuel decarbonisation (with uptake of electric cars and buses, and biofuel and hydrogen-fuel freight movement). This is despite evidence that electric cars are far from zero-carbon vehicles (**Hasan & Chapman, 2019**). In addition, measures such as the proposed clean car standard and clean car policies (MoT, 2019), and a ban on

new petrol and diesel vehicle sales from a date such as 2030 are likely to prove necessary.

## **2) Energy efficiency in residential buildings**

Energy efficiency is low hanging fruit for reducing residential emissions. Most housing is old and uninsulated or poorly insulated. Housing is a significant energy user with residential energy use accounting for 13% of total energy use in New Zealand (34% of that is on space heating) which presents a great opportunity to make significant energy efficiency gains by insulating houses properly. Residential heating is most often used on cold winter nights when New Zealand uses peaking thermal generation, so a reduction in the amount of heating needed on winter nights would have a direct effect on energy-system related emissions. Dwellings being warmer may also help reduce emissions from the health system needed to treat illnesses related to cold housing (**Grimes et al., 2012; Ingham et al., 2019; Shorter et al., 2018; Janson et al., 2019; Malik et al. 2018**).

### **Question 2:**

***In your areas of expertise or experience, what actions or interventions may be required by 2035 to prepare for meeting the 2050 target set out in the Bill? Please provide evidence and/or data to support your assessment.***

### **Answer:**

- The longer-term target (2050) of net zero carbon undoubtedly places a large expectation on the transport, cities (built environment) and housing sectors to contribute equitably (and efficiently) to emissions reductions. We see no reason why these sectors should not play a major role in emission reductions, alongside industry, agriculture and waste sectors. It is critical that they initiate preparatory actions to minimise carbon emissions in the 2036-2050 period.
- While the first three budget periods can begin to open up opportunities such as changes in urban form, the latter budget periods to 2050 will provide much greater opportunities for transformation in terms of urban form and transport systems. Certain expectations such as the banning of sales of new fossil fuelled vehicles (perhaps by 2030 but certainly within a later budget period) will help to expedite the necessary transition. Policy action on a vehicle ban would be best aligned with policy action among progressive countries such as those of the EU in order to build international momentum in the transition.

### **Question 3:**

***In your areas of expertise or experience, what potential is there for changes in consumer, individual or household behaviour to deliver emissions reductions to 2035? Please provide evidence and/or data to support your assessment.***

**Answer:**

- In regard to the residential buildings sector, New Zealand houses are often colder, sometimes much colder (**Isaacs et al., 2010**), than World Health Organisation recommendations (**World Health Organization, 2018**). In order to both promote New Zealanders' well-being, and reduce the likelihood of emissions savings in residential heating causing increased emissions through the health system if a person becomes ill due to living in a cold/damp/mould dwelling, it is necessary to plan for residential emissions savings to occur through increased residential energy services being obtained from the same energy input (**Ralph Chapman, Howden-Chapman, O'Dea, Viggers, & Kennedy, 2009; P. Howden-Chapman et al., 2008; Lloyd, Callau, Bishop, & Smith, 2008**), rather than through a reduced energy input which leads to reduced energy services. (Of course, the best option would be reduced energy input leading to increased services, that would require an even bigger investment in materials to increase energy efficiency). Therefore we **do not** recommend behaviour change as the primary way to reduce carbon emissions due to residential heating, we believe change to the material environment is necessary.
- In the transport sector, individual-level mode shifting and consumption decisions are important factors in determining overall carbon footprints. However, more research is needed to determine behavioural responses to emerging mode choices. Some US evidence, for example, suggests that where e-scooters are introduced, there is likely to be a carbon saving if these reduce personal car use, but not if e-scooter use replaces public transport use or active travel (**J Hollingsworth, B Copeland, & Johnson, 2019**).

**Question 4:**

***When advising on the first three emissions budgets and how to achieve the 2050 target, what do you think the proposed Commission should take into account when considering the balance between reducing greenhouse gas emissions and removing carbon dioxide from the atmosphere (including via forestry)?***

**Answer:**

- This is outside the immediate domain of the Centre for Sustainable Cities, but we suggest two considerations.
- First, as a matter of policy experience, excessive reliance on removals by sinks runs the risk of deferring the rapid transformation of the New Zealand economy to zero carbon. This has been seen since the Kyoto Protocol (1997).

- Second, we support the analysis by the PCE, Hon Simon Upton, that there is a logic in balancing biogenic GHG emissions with biogenic carbon sinks, but **not** in balancing fossil emissions with biogenic sinks.

**Question 5:**

***What circumstances and/or reasons do you think would justify permitting the use of offshore mitigation for meeting each of the first three emissions budgets? And if so, how could the proposed Commission determine an appropriate limit on their use?***

**Answer:**

We provided a comment on this matter in our submission on the 'Zero Carbon' bill:

- The Bill proposes that 'Emissions budgets must be met, as far as possible, from domestic emissions reductions and domestic removals.' The explanatory note asserts that this 'does not preclude New Zealand's ability to count reductions sourced from overseas towards achievement of its nationally determined contributions, if required...'
- In our view this thinking risks emasculating domestic policy action. This approach is likely to lead to undue uncertainty, with the potential for the transition to a new economic and social pathway (including the domestic price of emissions reductions) to be undermined by the unpredictable acquisition of significant quantities of international units. It could create policy instability, undermining the intent of the Bill to create a clear downward trajectory of greenhouse gas emissions. In other words, it could undermine 'strong, early mitigation action' which, as the Regulatory Impact Statement for the Bill points out, 'has the potential to place New Zealand at a comparative global advantage', with 'upsides or "cobenefits" to be expected, including improved environmental, health and social outcomes.'
- Our reasoning is based not only on domestic considerations – uncertainty created for the domestic market – but also based on the importance of what New Zealand is *seen* internationally to be doing (the 'optics'). The optics are effectively as important as what New Zealand actually does, given that the logic of New Zealand's position is fundamentally one of demonstrating good global citizenship and influencing the international community through our actions and a credible and predictable plan of action.
- It is notable that in the UK, the CCC has recommended that the limit on international units should be 0%, but that the UK may purchase international credits to contribute to global mitigation efforts, as long as this is additional to

domestic progress. We understand the UK government has opted for a limit for the 2013-17 and 2018-22 budgets which equates to 1.9% and 2.2% margins. We believe a similar logic applies to the New Zealand situation.

- In our view the target should not allow for more than a small buffering contribution from international units, say 1% of the target emissions reduction quantity. This very limited amount would be mandated by the Commission.

## **Section B Emissions reduction policies and interventions**

The proposed Commission will also need to consider the types of policies required to achieve the budgets it proposes. This consideration should include:

- sector-specific policies (for example in transport or industrial heat) to reduce emissions and increase removals, and
- the interactions between sectors and the capability of those sectors to adapt to the effects of climate change.

### **Question 6:**

***What sector-specific policies do you think the proposed Commission should consider to help meet the first emissions budgets from 2022-35? What evidence is there to suggest they would be effective?***

### **Answer:**

In regard to the transport and urban form domain, please refer to our answer above.

Residential sector emissions should be targeted through two main avenues:

- Retrofitting energy efficiency measures into existing dwellings (**P. Howden-Chapman et al., 2007; Lloyd et al., 2008**). As much of the New Zealand housing stock is cold, this may help reduce emissions either through a reduction in heating energy required, or through a reduction in the emissions from the health system treating cold housing related illnesses (**Ralph Chapman et al., 2009; P. Howden-Chapman et al., 2008**).
- Upgrading the building code to require new dwellings to be low carbon and zero, or near-zero, energy by 2030. This should include both low carbon building techniques and materials, and the longer term running costs and maintenance estimates. The insulation standard in the current building code was designed considering energy prices from a decade ago, and without focussing on mitigation of carbon emissions (**Standards New Zealand, 2009**).
- We also recommend that the Commission carefully evaluate the effect on investment in small scale residential renewable electricity generation of the removal of the low-fixed charge electricity tariff regulations (**"Electricity Low**

**Fixed Charge Tariff Option for Domestic Consumers Regulations," 2004)** recommended by the recent electricity price review (**New Zealand Government, 2019**). The removal of this incentive to invest in energy efficient appliances, retrofitted insulation, or the upgrading of new buildings to better-than-code may have flow-on effects involving greater energy use – including at peak times – and in turn may cause the generation of more emissions either through the use of additional thermal generation and/or the building of new electricity plants before they would otherwise be necessary.

**Question 7:**

***What cross-sector policies do you think the proposed Commission should consider to help meet the first emissions budgets from 2022-35? What evidence is there to suggest they would be effective?***

**Answer:**

- Across the economy as a whole, it is critical to have effective pricing instruments at work, especially for the long-lived gases (CO<sub>2</sub> and N<sub>2</sub>O). We accept that in regard to methane there will be a separate pricing and incentive structure.
- In regard to carbon pricing, it is critical that arrangements signal rising carbon prices over time. We note the evidence from emerging literature that the social cost of carbon may be up to around NZ\$600 (up to US\$400) and likely to rise (**Ricke, Drouet, Caldeira, & Tavoni, 2018**). New Zealand to date has faced an undesirably low cost of carbon, and this needs to be raised to reflect the best scientific and economic evidence on the social cost of carbon, with a careful but repeated public explanation of why it is necessary for the price to rise.

**Question 8:**

***What policies (sector-specific or cross-sector) do you think are needed now to prepare for meeting budgets beyond 2035? What evidence supports your answer?***

**Answer:**

It will be important to undertake a long-term educational programme to increase understanding of the need to continue mitigating climate change, through a range of complementary measures which is not limited to pricing of carbon.

## **Section C Impacts of emissions budgets**

The proposed Commission will need to consider the potential social, cultural, economic and environmental impacts of emission budgets on New Zealanders, including how any impacts

may fall across regions and communities, and from generation to generation. Potential impacts may be either positive or negative.

**Question 9:**

***What evidence do you think the proposed Commission should draw upon to assess the impacts of emissions budgets?***

**Answer:**

In line with the commitment to a just transition, research is needed on distributional effects and measures to mitigate these impacts. However, alongside this, it will also be important to measure the **beneficial effects** of policies, i.e. policy co-benefits, and their distribution (for example **Bennett et al 2014; Haines A. 2017**).

**Question 10:**

***What policies do you think the proposed Commission should consider to manage any impacts of meeting emissions budgets? Please provide evidence and/or data to support your assessment.***

**Answer:**

In principle, any adverse distributional impacts can be managed through (a) the tax and benefit system; and (b) active labour market policies. However, there needs to be active monitoring of impacts and adjustment of policies to ensure significant unintended effects on disadvantaged groups are addressed and minimised.

**Section D Other considerations, evidence or experience**

**Question 11:**

***Do you have any further evidence which you believe would support the future Commission's work on emissions budgets and emissions reduction policies and interventions?***

**Answer:**

In the residential sector, it tends to be both more effective and more efficient to build a new building to a high quality than it is to retrofit an older building to a similar quality. Therefore we recommend, as a matter of urgency, that the Commission investigate the upgrading of the building code to ensure that all new residences are low carbon and zero or near-zero energy buildings in order to ensure that low emissions are locked into the building for all the years of its use.

Please email your completed form to [feedback@ICCC.mfe.govt.nz](mailto:feedback@ICCC.mfe.govt.nz) by **12 noon, Friday 15 November 2019**.

If you have any questions about completing the call for evidence, please contact us via [feedback@ICCC.mfe.govt.nz](mailto:feedback@ICCC.mfe.govt.nz).

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