

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 Bill¹. 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.

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.

¹ Climate Change Response (Zero Carbon) Amendment Bill:
<http://www.legislation.govt.nz/bill/government/2019/0136/latest/LMS183736.html>.

What will we do with the evidence we gather?

We will use this information to inform our initial work on emissions budgets and add to the evidence base the proposed Commission will draw upon.

Confidentiality and data protection

All or part of any written response (including the names of respondents) may be published on our website www.iccc.mfe.govt.nz. Unless you clearly specify otherwise, we will consider that you have consented to both your name and response being published.

Please be aware that any responses may be captured by the Official Information Act 1982. Please advise us if you have any objection to the release of any information contained in your response, including commercially sensitive information, and in particular which part(s) you consider should be withheld, together with the reason(s) for withholding the information. We will take into account all such objections when responding to requests for copies of, and information on, responses to this document under the Official Information Act.

The Privacy Act 1993 applies certain principles about the collection, use and disclosure of information about individuals by various agencies, including the Interim Climate Change Committee. It governs access by individuals to information about themselves held by agencies. Any personal information you supply to the Committee in the course of making a response will be used by the Committee only in relation to the matters covered by this document. Please clearly indicate in your response if you do not wish your name to be included in any summary of responses that the Committee may publish.



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. 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. We may follow up for more detail where appropriate.

Contact details

Name and/or organisation	Solis Norton (BAGSci, MAppSci, Phd (veterinary epidemiology)), Project Manager, DeerPRO. Member of the International Society for Biophysical Economics
Postal Address	
Telephone number	
Email address	

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: I submitted on the Climate Change Response Amendment Bill (July 2019) under the name Solis Norton.

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

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 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:

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:

This answer follows on from my conversation with Kennie Tsui at the biofuels meeting held in Wellington by the Bioenergy Association on November 12.

An important action by the Climate Change Commission to support their emissions budgets is to prepare concurrent Energy Return On (Energy) Investment budgets.

Energy Return On Investment (EROI, sometimes referred to as net energy analysis) is a steadily growing field of science in the area of biophysical economics. Fundamentally, it is a method of measuring the inputs and outputs of an energy system (eg wind turbine) purely on an energy scale (joules). All forms of inputs are quantified including the embedded (also known as indirect) energy contained in for example the concrete, steel, technology, maintenance, and recycling of the turbine. The end result is a ratio (outputs:inputs) representing the ability of that energy source to deliver energy to society over its lifetime.

The overall EROI for New Zealand can be calculated by combining the respective EROI values for our various energy sources and weighting them by the amount of energy we want them to deliver.

Our national EROI value will change over time and for each emissions budget because the EROI for fossil based energy sources is higher than for most renewable options. So our transition to a more renewable energy mix with lower emissions will substantially change our national EROI and thus the amount of energy available to fuel our economy.

An EROI budget alongside each of the first three emissions budgets is like a complimentary lens to our otherwise economic view of transition. But a lens rooted in in the immensely robust fields of physics and energy. It is critical for several reasons. With it we can model scenarios for optimising our energy mix both with respect to emissions and to energy supply. In addition, we will see shortfalls in energy supply not visible with economic methods. Most importantly, we will have a robust, independent method as a counterpoint to our economics for ensuring our national energy mix is right for the time. That same robustness may not be afforded by our economic system which will experience extraordinary and unprecedented pressures, some intended, others not, as we change course and navigate toward a low emissions economy.

EROI is described on Wikipedia and for more detail I would suggest the book “Energy Return On Investment” (2017) by Professor Hall which I assisted with. It has grown over the last 20 years to be the methodological approach of over 100 scientific articles published annually. A good starting point in the literature would be Hall & Lambert (2014) “EROI of different fuels and the implications for society” in the journal Energy Policy (<http://science-and-energy.org/wp-content/uploads/2016/03/Hall-Lambert-and-Balogh-2014-EROI-of-different-fuels-and-the-implications-for-society.pdf>).

The idea of calculating EROI at the national level is new but not unique. Last year I travelled to Leeds to visit the authors of the first report of this approach: “Developing and input-output based method to estimate a national level Energy Return On Investment” (Brand-Correa et. al, *Energies*, vol 10 (2017).

https://www.researchgate.net/publication/316190095_Developing_an_Input-Output_Based_Method_to_Estimate_a_National-Level_Energy_Return_on_Investment_EROI

Much of the expertise to undertake EROI analysis is available within New Zealand and I have an international network of experts that could provide support and advice where necessary, notably Professor Charles Hall and the very strong research group in this area at the University of Leeds, School of Earth and Environment, Professor Paul Brockway in particular.

I applied a high level EROI analysis to technical data underpinning the “Low emissions economy final report” published in 2018 by the New Zealand Productivity Commission. This was part of a Nuffield International Farming Scholarship. My analysis showed New Zealand society would be around 10% short of its anticipated energy supply in 2050 and substantially shorter in energy use per capita. I would be happy to present these findings to the Interim Climate Change Commission to highlight the utility of EROI.

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:

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:

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:

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:

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:

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:

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:

Energy Return On Investment

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:

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:

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