

26 March 2021

Climate Change Commission

Submission on:
2021 Draft Advice for Consultation

Summary of recommendation

That the Climate Change Commission:

- Revisit its *reduction plan advice* to Government so that its recommendations encourage more systematically management of the uncertainties.
 - The current uneven treatment of uncertainty creates unnecessary costs and misses opportunities.
- Specifically, the Commission in its final advice should include as part of the proposed National Energy Strategy the reviewing of the material uncertainties and risks in achieving the Government’s energy objectives, and setting out its policy response.
 - The Strategy should address all major energy outcomes, not just emissions reductions.
 - The review of uncertainties and risk needs to systematically identify all material “known unknowns”.
 - The policy response should, where appropriate, establish research programmes to help address the uncertainty and develop responses, including strengthening our ability to adapt.
- The Commission should itself adopt this approach in formulating any specific *reduction plan advice*. Doing this will cut across some of the Commission’s draft advice, particularly in Transport, Buildings and Urban Form.

Introduction

This submission addresses the key issues that NERI¹ considers arise from the Commission's draft advice. We limit our comments to its *reduction plan advice* in the energy sector, particularly Impacts (Chapter 5) and Policy Direction (Chapter 6) of the Draft Advice (DA)².

Our overriding concern is that uncertainty and how to manage with it is not addressed systematically in the DA. Chapter 17 looks at the Challenges involved in achieving its selected Budget. This is in turn based on achieving a particular Pathway as described by its modelling.

But this begs the question "What if the modelling and its assumptions are wrong?" (and they will be).

The proposed National Energy Strategy offers the opportunity to do this more systematically, through a less constrained lens of where the risks lie, and on a regular basis.

In some of its comments this seems to be the Commission's intent. But the Strategy is also characterised as a top-down plan to achieve a predetermined pathway to emissions reductions, i.e., giving effect to the Commission's models. Some recommendations are also of this prescriptive nature, and together they create the risk of NZ facing unnecessary costs, risks and missed opportunities.

Management under risk and uncertainty and its emphasis on setting up adaptive dynamics is well understood. It is, at least in part, honoured in some of the Commission's principles.

Central to this is identifying at least all the "known unknowns" and investing in understanding them better with a view to reducing them, exploiting them and/or strengthening our ability to adapt. Just delaying an action may give the necessary certainty, but in many cases applied directed research will accelerate this at much lower cost than the risk of taking a premature action.

Better understanding of the uncertainties will (equally importantly) both help identify both areas where action is not warranted, and opportunities to accelerate beneficial change.

¹ The National Energy Research Institute (NERI) is a Charitable Trust incorporated in New Zealand. Its primary purpose is to enhance New Zealand's sustainability and to benefit the New Zealand community by stimulating, promoting, co-ordinating and supporting high-quality energy research and education within New Zealand. Its research members are Auckland University of Technology, GNS Science, Scion, University of Canterbury and the University of Otago, and its industry association members are the Bioenergy Association, BusinessNZ Energy Council, the Carbon and Energy Professionals New Zealand, the New Zealand Wind Energy Association, the Road Transport Forum and Tourism Industry Aotearoa. This submission may not represent the views of individual members.

² For the sake of simplicity issues around net emissions, abatement, and CCUS have been put aside, but need to be incorporated by the Commission in any approach following our recommendations.

In what follows we briefly give some further context and then, broadly using the structure of the DA, illustrate the weakness in not looking more widely at the uncertainties. This is then suggestive of how the Commission needs to change its methodology in developing its final advice, and indicates recommendations that need to be revisited.

Context

ETS

In what follows we assume the Government has established a budget for emissions reductions, and there is a reasonably efficient ETS in place covering energy. Thus, there is a reasonably economically efficient process in place driving towards the Government's emissions targets.

In this context further action by the Government has to be justified by it lowering the costs (economic, social, cultural, environmental³) of the process already in place.

Materiality

One implication of the ETS process, coupled with the general uncertainty of the outcomes from policy actions, is that targeting small reductions in the costs of emissions is unlikely to produce gains outside the margin of error.

Thus, effort addressing areas of relatively high emissions will have much higher expected returns than, say, areas producing <10% of the current total emissions unless there are other considerations⁴. Effort is better focused on the former.

Assumptions

In setting its emissions budgets and testing likely impacts the Commission relied upon coupled deterministic scenario modelling. To ensure these were reasonably robust it used conservative input assumptions, only covering a relatively limited number of drivers.

This can be justified for the limited task of setting budgets and testing their impacts.

However, using this type of modelling to develop possible actions to help achieve those plans is quite inappropriate.

Assumptions that have been ruled out of scope in the conservative world of budget setting may well be precisely the ones we wish to explore when thinking about how we could do better.

³ In what follows when we use the terms "costs" and "benefits" they should be read as being measured on an appropriate balance of all these dimensions.

⁴ E.g., in electricity generation where there is the need for significant growth will make its potential use of fossil fuel material.

Further, the deterministic simplicity of scenario modelling is a trap when thinking about interventions. Such a scenario run could justify a prescriptive intervention, when a proper assessment, considering the full range of assumptions and the cumulative uncertainties could reach quite a different conclusion.

The Commission falls into this trap several times, and this extends to recommending prescriptive interventions simply based on its desire to have the future fit with its rather crudely projected preferred pathway.

Recommended actions and what might have been missed

What follows is a high-level sketch of what might have been missed. It is intended just to make the case for a much more systematic review of the uncertainties, independent of the Commission's pathway scenarios.

Future fuels

Reducing emissions in energy can be approximated by cutting fossil fuel use (assuming the current political consensus favouring renewable resources remains⁵). Currently 2/3rds of our domestic consumer energy use is fossil fuel, and this is approximately the amount we import.

Shipping energy to NZ by other than fossil fuels is difficult and will remain so for the foreseeable future. Renewable energy imports will be unlikely even in the medium-term⁶, particularly because it will be in high demand internationally and we have comparative advantage in producing it.

Transitioning to producing our renewable energy locally is therefore a reasonably certainty, and this will be a significant challenge if costs are not going increase dramatically.

We currently have two sources of renewable energy: electricity and biomass⁷, with hydro/water, wind, solar, geothermal, and land use underpinning these. Priorities for water and land use are the basic constraints.

Electricity

In the case of electricity there is an existing system with significant installed infrastructure and skill base in support. Notwithstanding there will be risks (and opportunities) around growth.

Necessary action (NA) 5 in the DA gives the Commissions' five priorities for action. Two directly address adaptability, and two seek to give certainty one by the

⁵ Reducing emissions can be achieved through fossil fuels and CCUS, and this will be the strategy that is dominating internationally.

⁶ Exporting products like foods that use clean electricity is both a lower cost way to export the energy and likely to add much more value.

⁷ Renewable hydrogen and synthetic fuels etc will be just a vector for one of these.

Government being clear about what it will do with dry year risk, the other to eliminate coal as a fuel (a case where the Commission appears to recommend prescription to meet its modelling). Finally, it recommends the Government ensures affordable and accessible electricity.

A more systematic review would have identified a broader set of risks and opportunities. Two examples:

First, is the critical need for low-cost access to the natural resources required for significant new generation, and the ability to deploy conversion and distribution infrastructure. This raises the adequacy of the regulatory framework and the extent to which we prioritise access for electricity over other competing uses for these resources.

Second, storage and demand side management are very active areas of development with the potential for unique NZ impacts well beyond the Commission's modelling assumptions. Since they have a significant ICT component uptake could be relatively fast, and much of it will occur outside the traditional energy sector.

This will present opportunities and risk that the Commission has missed.

Biofuels

Biofuels are much less developed industry. There are established markets and supply chains for solid fuels, but energy cropping⁸ and cost-effective technologies for conversion beyond specific areas⁹ are just emerging internationally.

NA 6 recommends addressing this and renewable hydrogen through the proposed National Energy Strategy. If the Strategy is properly specified that would be the appropriate thing, including placing this in the wider biochemicals context.

A major uncertainty that the Commission raises on the demand side is the inclusion of international air and sea. Biofuels look like the preferred options for long-haul flight and potentially international marine, represent ~20% additional fossil fuel use and NZ is uniquely exposed by way of location.

This warrants highlighting, and discussion by the Commission beyond just suggesting fuel mandates.

Transport

Cut travel by private vehicle travel by increasing other modes

NA 2 recommends increasing the funding to modes other than private vehicles by hundreds of millions of dollars per annum¹⁰ to displace trips by increasingly low

⁸ Not mentioned in the Commission's report although it has significance for sequestration and land use priorities.

⁹ E.g. biogas from anaerobic digestion.

¹⁰ By inference, Evidence Chapter 4a p.18

emission private vehicles with cycling, walking and public transport. It further recommends incentivising public transport and encouraging Councils to implement (presumably low emissions) first and last kilometre services. It also recommends encouraging working from home.

The mode shift recommendation will have no value in emissions reductions post-2050, the Commission offers no estimate of the reductions, if any, in the interim, nor any analysis of the potential adverse effect by significant funding shifts on the more intractable and larger emissions elsewhere in land transport.

The recommendation linking government funding to the achievement of emissions budgets is inappropriate when any relationship will be serendipitous.

The future of first and last kilometre services is a wider issue than just Councils, and the impact of ICT on alternatives to mobility and logistics is potentially much more significant than just working from home.

Future demand for mobility is already being impacted by emerging technologies like telepresence; online commerce, with implications for urban form; more efficient logistics and options for first and last kilometre; transport as a service, with implications for capital utilisation and fleet turnover; and possibly autonomous vehicles.

Behind these uncertainties lies potential to both reduce trip kms and achieve more efficient clean vehicle use. Investing in better understanding these opportunities would be a much lower cost alternative than large shifts in Vote:Transport for no apparent gains.

The mode shifting red herring and the need to achieve the Commission's modelling assumptions have distracted the Commission from recommending a systematic analysis of the material uncertainties and opportunities.

EVs

EVs appear to be well suited for NZ. We have significant supplies of renewable electricity, ability to expand that, and a very good generation and distribution infrastructure to the home (240V).

There are also uncertainties: availability of EV supply, cost of ownership, speed of uptake, range anxiety, life of EVs, recyclability, and total lifetime emissions.

Also a significant proportion of the population have relied upon low cost relatively new imports of ICEs from Japan, and EVs will have a hard time competing with these, although Japan appears set to move to FCEVs because of their reliance on imported energy and supply of imports could dry up.

The Commission has developed Time Critical NA 2 and overlapping NA 3 in response. By and larger the latter provides ways to address adjustment that largely follow on from the Productivity Commission's early work on a Low Emissions Economy (2018).

As with the modal shift recommendation new technologies that could significantly impact on EV uptake and use are not considered.

The more prescriptive Time Critical NA 2 is required to meet the timings indicated by the Commission's preferred pathways. The ban on ICE imports may have unintended consequences.

Trains, ships, heavy trucks and planes

There are multiple contenders to fuel the heavy-duty cycle transport fleet in NZ. Electrolytic hydrogen, better batteries and charging, biofuels, or hybrid combinations.

Long haul aviation seems reliant on bioavgas, regional aircraft hybrids, and biofuels for larger coastal shipping and larger look likely.

NA 4 recommends a few specific initiations for some fuels and applications, but by and large this is an area where we should acknowledge what we do not know and simply proceed to manage the uncertainty:

- Ensure any initiatives are even handed or level the playing field.
- Invest in a comparative study and roadmap of the various fuels and applications, including potential demand side opportunities in the analysis.
- Develop options and low-cost initiatives that might further reduce the uncertainty and risk.

Industrial

Significant industrial fossil fuel use is concentrated in a small number of industries.

- Food is approximately 50:50 coal:NG. It is predominantly used to produce medium grade heat for cooking and drying. Electricity and biomass can substitute, and this is ongoing.
- A small number of companies that use fossil fuel for high grade heat (e.g. cement, petrochemicals) or as feedstock/ingredient (e.g. steel, aluminium). These tend to be harder to abate.

NA 7 addresses process heat (i.e. predominately food) and makes two recommendations that support adaption, and two that mandate direct constraints (banning new coal burners and measures to cut boiler emissions). The last two seem to be driven by the assumptions in the Commissions modelling.

NA 8 addresses the hard-to-abate processes and does so broadly with improved adaptability in view.

The uncertainty with industrial fossil fuels is how they will respond to consumer pressures for cleaner products. NZ producers are particularly sensitive to issues being raised about dirty supply chains. This could upset modelling assumptions on quite short time frames.

Buildings

Emissions from commercial and residential building heating are not particularly significant. Fossil fuels represent about a quarter of the energy current used here. The Commission sees targeting NG as the priority.

Warm dry homes have value for a range of reasons and improvements in minimum thermal performance is an ongoing goal, independent of emissions reductions.

NA9 recommends improving thermal standards; mandatory performance for commercial and public buildings; ceasing new gas connection; and targeting new or replacement heating systems to be electric or bioenergy. These are required to deliver on its modelling assumptions.

Not discussed is the extent to which biomethane from anaerobic digestion of wastes delivered through existing local infrastructure could more quickly address NG use. If so this cuts across the assumptions in the Commission's recommendations.

Reduce emissions from Urban Form

The Commission notes the evidence for links between urban form and emissions "remains limited". This is reinforced by the Productivity Commission in two reports *Better urban planning (2017)* and *Low emissions economy (2018)* where it concluded the evidence is not clear cut, outcomes are uncertain, and other policies are likely to be better.

Specifically, as with the mode shifting recommendations, urban form will have no impact post 2050 and diminishing returns up until then. It will be slow to have any impact and high cost. Other outcomes like achieving affordable housing are likely to be much higher priority, and the Commission's recommendations should be on those areas where material emissions reductions can be achieved beyond what the ETS will deliver.

Despite this in NA 10 recommends actions that assume this is a significant issue.

Conclusion

As noted, the method used by the Commission to develop *reduction plan advice* is flawed and consequently the scope is too narrow, and the response is often too prescriptive.

Lower cost less risky research and investigation into a less constrained view of the uncertainties, focused on reducing the risks and increasing adaptability, is required in both the Commission's own work and in any processes the Government might set up.



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