

Submission on the Climate Change Commission's first package of advice

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We congratulate the Climate Change Commission on a landmark package of draft advice. It represents a significant development in New Zealand's climate change response. At last we are contemplating the start of our journey of phasing out the burning of fossil fuels and seriously weighing up the balance between past and present actions and our responsibility to future generations and to the earth system. It is a major step forwards. Taken all together, it is powerful and moving. Thank you to the Commissioners, to the staff of the Commission, and to all the politicians, climate advocates, and to the people of New Zealand, for reaching this point.

As background to this submission Paul Callister and Heidi O'Callahan have prepared a working paper looking at the decarbonisation of transport in much greater detail. The views in the working paper are however those of the two authors [Callister].

We confine our submission mostly to two big areas: the level of ambition and transport policy. In particular, aviation and intercity public transport are areas that need more attention.

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I. Carbon budgets

The proposed budget for 2022–2030, equivalent to 628 Mt CO₂e in 2021–2030, is not ambitious enough to meet the goal of keeping global warming to 1.5 degrees Celsius, because:

1. Its main pillar of support appears to be that it is domestically achievable under the models prepared by the Commission. But these do not reflect our highest possible ambition; in any event, the uncertainties are large and depend on new technologies and the speed of uptake of

present technologies, and on patterns of demand. The requirement in the Zero Carbon Act for the CCC to advise “how the emissions budgets, and ultimately the 2050 target, may realistically be met, including by pricing and policy methods” does not mean that a detailed pathway guaranteeing the desired reductions for all sectors must be provided. It’s enough that the budgets, divided by gas and broad sector, are in line with what other countries are proposing with similar levels of ambition.

2. The figure of 564 Mt, given as the midpoint of equal per-capita contribution of 1.5°C, has applied global reductions for net CO₂ to New Zealand’s gross CO₂, a conflation of net-net and gross-net accounting.
3. It does not appear that attempts were made to assess the viability of a 564 Mt or other lower budgets or to explain why the gap should be closed through international rather than domestic mitigation.
4. The Zero Carbon Act requires budgets to be set “(a) with a view to meeting the 2050 target and contributing to the global effort under the Paris Agreement to limit the global average temperature increase to 1.5° Celsius above pre-industrial levels; and (b) in a way that allows those budgets to be met domestically”. Considering that the draft budgets are admitted by the Commission to not meet the 1.5°C goal; that the Climate Change Minister has also accepted that the current NDC does not meet the 1.5°C goal; and the draft budgets do not meet the current NDC, the budgets must be reduced.

Therefore, the budgets do not fulfil the Zero Carbon Act.

Another problem is the impact of NDC Accounting and our past pattern of afforestation. Net NDC emissions for the decade 2009–2018 were 652 Mt; the proposed budget of 628 Mt is a reduction of less than 4%, which will be hard to explain. Meanwhile, we will still be reporting our actual emissions every year using GHG International accounting. These were 548 Mt in 2009–18 and would be [using the removals listed in Figure 7.1] 602 Mt in 2021–30, an increase of 10%.

As New Zealand’s per capita historical contribution to CO₂ [a suitable metric for a stock pollutant] is about 5 times the world average, similar to other developed nations; and our current per capita biogenic CH₄ [a suitable metric for a flow pollutant; world 217 Tg CH₄, NZ 1.2 Tg] is about 8 times the world average, our contribution to net long-lived gases should be at least equivalent to other ambitious developed regions, such as the UK and EU, and our contribution to biogenic methane should be higher than the world average (not lower, as in the draft budgets, or “at least equal” as in the NDC discussion).

Accepting the CCC methodology, but changing the 34958 kt gross CO₂ in Table 10.2 to 20900 kt, to account for the 14000 kt of removals listed in Figure 7.1 for NDC removals in 2010, gives a lower quartile budget of 592 Mt and upper quartile budget of 516 Mt.

Recommendation

Budgets equivalent to net emissions of 516 Mt CO₂e in 2021–2030, commensurate with our status as a developed nation with high historical and present emissions, matching the ambition of other ambitious developed nations, and meeting the requirement to halve fossil fuel burning in the next decade.

This would still likely not be 1.5°C-compliant, but it would be a lot closer, and could be excused on grounds of highest possible ambition and food production.

Note that the EU is planning to reduce long-lived gases 45% over 2018–2030. They will be doing this mostly through reductions in fossil fuel burning, whereas we will be using more trees. They also face different challenges to us (space heating, lower transport emissions to start with).

We are already exposed as making an insufficient contribution because our 2050 goal is not full net zero, and because we are planning to use far more forest sequestration than other countries. (The CCC pathway shows 24 Mt CO₂ of sequestration in 2050, more than half our present gross emissions of long-lived gases.) We cannot add to these weaknesses by also allowing our internationally reported emissions to increase in the coming decade.

II. The Nationally Determined Contribution

Gross-net accounting also figures in the statement of the NDC.

If retained, it risks leading to our NDC being determined to be insufficient.

The explanations and justifications for net-gross accounting in the Draft Advice may be valid for the fixed baseline of 1990, but not for a shifting baseline (2005 or 2010). The effect of shifting the baseline is not discussed in the draft advice.

Consider the scenario of a country with constant gross emissions of 100 Mt/year from 1970-2030. Early in 1990 a large new forestry plantation is established. Suppose that under Kyoto rules it sequesters carbon at a constant rate, say 30 Mt/year, for each year 1990–2010, and nothing thereafter.

For 2010 reporting, it is reasonable to compare net emissions in 2010 (70 Mt/year) with gross emissions in 1990 (100 Mt/year), because net emissions really are lower over the 1990–2010 period (namely, 70 Mt in each year) than in the previous period, both under Kyoto accounting and in actuality.

For 2030 reporting, it is not reasonable to compare net emissions in 2030 (100 Mt/year) with gross emissions in 2010 (100 Mt/year). Doing so would be to claim that emissions have been constant. In actuality they are higher throughout the whole period, namely 100 Mt/year compared to 70 Mt/year in the previous 20 year period.

Gross-net accounting inflates our past emissions, making the headline target sound better than it really is, and exposing us to criticism. The EU is using NDC Accounting, but with a 1990 baseline under which net = gross emissions in 1990, so that the issue doesn't arise for them.

As far as we can tell, no other country or region is using gross-net accounting in the same way that New Zealand is currently doing. Australia and the US are using net-net GHG International accounting with a 2005 baseline.

Recommendations

1. Either express the NDC relative to a 1990 baseline, or give separate targets for gross–gross and net–net emissions.
2. The NDC should explain in detail in its NDC why it is fair and ambitious and the criteria that were used to determine this [Rogelj]. This is a critical part of the Paris Agreement process.
3. International contributions don't need to be expressed in Mt CO₂e, or relatively to New Zealand's emissions; they can be described in terms of other climate goals such as decarbonising the Pacific, international climate funding as a percentage of GDP, etc. They can be pursued through other mechanisms than the NDC or carbon budgets.

III. Aviation

By not including international aviation in the draft recommendations a major contributor to transport emissions is excluded. While the CCC was not required to consider international transport, we suggest that when publishing emission data all government agencies include its contribution.

Based on a growing research literature, a factor for radiative forcing should be included in all aviation emissions. Research indicates that radiative forcing amplifies aviation emissions. A 2021 study provides a median estimate of a 2.8 times amplification with 90% confidence intervals of 1.5 to 5.7 (log normal distributed) [Lee].

By excluding international aviation, discussions of ways to decarbonise are incomplete. For example, the latest Transpower report on electricity requirements for decarbonising New Zealand does not address international aviation. If planes are to fly using batteries and electricity, the electricity needs to be generated in New Zealand. If it is based around Power-to-Fuel, non-crop biofuel, or hydrogen, it can be produced in New Zealand or imported. If produced locally the needs for renewable electricity are very large. For example, a study [Mason] estimated the amount of renewable electricity that would be needed if 1. Hydrogen was produced by electrolysis 2. The liquid hydrogen was used to power all domestic and New Zealand's international aviation. Using a base of 2014 they found electrical energy requirements ranged from 28,555 GWh/y for the base scenario, to 46,555 GWh/y for a 2050 high demand scenario. This was equivalent to 67% to 110% of New Zealand's 2014 electricity generation.

It is likely that international pressure to address international aviation emissions will only increase. At the moment, only Scotland includes these in its carbon budgets, but the UK has indicated that it will do so at some point. If it does enter our carbon budgets in the late 2020s, say, planning for this would need to start now. Otherwise the current favoured status of international aviation (no GST, no ETS, no fuel excise) will lead to overinvestment in this area. In the UK, for example, aviation has gone from 3% to 10% of CO₂ since 1990. In New Zealand in 2018 it was 13%.

A recent EU report has concluded that the best way for the EU to reduce aviation emissions and maximize employment and economic activity is to bring all aviation into the EU ETS [Corsia].

Recommendations

1. All government climate reporting should include international aviation and shipping (under CO₂) with the relevant radiative forcing factors (under CO₂e). These can be marked as for noting only.
2. All local authorities should also provide estimates of aviation emissions from their areas. Greater Wellington Regional Council has already included aviation in its regional reports.
3. Subsidies to aviation, either at a national or local level, need to be transparent. Ideally, these would be removed in most cases.
4. Support the Parliamentary Commissioner for the Environment's recommendations on aviation, noting that these are only a first step.
5. Government to model pathways to eliminate aviation emissions by 2050.
6. Civil Aviation Bill to address aviation emissions and the responsibilities of airlines and airports around them.

IV. Walking, cycling and public transport

We are skeptical that the draft transport policies will cut transport emissions 47% by 2035. Based on evidence from other countries it seems likely that far stronger action will be needed. For example, Ireland has brought in a requirement for 20% of all transport spending to be on walking and cycling, and for new public transport to be double new road spending. Just to take one example, the draft Horizons RLTP allocates 4% of spending to walking and cycling, 4% to public transport (some of it new), 36% to road maintenance, and 56% to new roads. The new roads, including two large expressways, will drive increased car travel and increase emissions. It will take strong action to prevent this.

Electric bikes offer an opportunity to transform transport in small cities and small towns. They are much cheaper and have lower energy requirements compared to electric cars, and there are bikes to meet the needs of all people - cargo bikes, bikes for people with disabilities, bikes with covers, bike buses for groups of young children. In Lithuania there has been a scheme where old cars can be traded in for subsidised electric bikes which has been very successful. Other governments are subsidising, or considering subsidising, e-bikes.

In the EU, uptake of EVs was very slow until 2020. Different countries had different policies and incentives in place, which provide us with some kind of guideline. The most extreme example is Norway's truly massive incentives (facilitated by previously-existing steep taxes on ICE vehicles) which have led to petrol sales falling by about 5% a year. (Ironically, this system has led to increased car ownership and use in Norway.)

Other countries are following suit: France has an EV subsidy of €8000, and the most polluting vehicles pay a fee of €20,000. Combined with the EU fuel efficiency standards of 95 gCO₂/km for 95% of vehicles, this brought the EV market share in France to 11% in 2020.

Private car travel is subsidized in New Zealand. A study for the Productivity Commission [Concept] put the subsidy (including externalities not paid for by the vehicle owner) at about 1/3 of the total cost, not

counting greenhouse gas emissions. The subsidy has increased since then via the 'NZ Upgrade' programme. Although this will be difficult to unwind, we have to make a start.

Recommendations

1. All urban areas to complete a safe cycleway network by 2030, centrally funded. New cycling infrastructure needs to primarily support daily travel rather than recreational cycling.
2. Councils to be required to transfer a minimum amount of space from motor vehicles and parking to active modes and be funded to do so.
3. The uptake of electric bikes, especially in low income areas, should be supported.
4. Government to study whether the road-building programme is compatible with climate commitments. If not, it should be slowed, trimmed, or cancelled.
5. All new expressways to be tolled, tolls 2-3 times higher than at present; congestion charging in major centres.
6. Annual CO₂-based registration fees to be introduced in the future, e.g. for cars first registered after 2022.
7. The 'Safer Speeds' programme should be accelerated, strengthened, and enforced.
8. Fines in the Clean Car Standard to be returned to the level proposed in 2019, i.e. \$100/gCO₂ instead of \$50. Target emissions should reduce linearly to zero from 2025 to the end-date for new ICE vehicles. No separate target for utes. No grace year for fines. Note that the draft CCC recommendation is actually weaker than what the government has already announced.
9. Incorporate recent data from Europe into the transport model.
10. 2030 should be the absolutely final date for new ICE vehicles, although we could have different dates for pure ICE, hybrids, and PHEV. Be prepared to react to Japan's forthcoming transport emissions policy, which may cut out the final large RHD market in the 2030s.
11. Data for transport emissions should be monitored monthly (from fuel sales) so that parameters in the available regulations can respond quickly.
12. Urban development on the fringes should only be permitted in conjunction with rapid transit.
13. Accelerate low-emission transition for freight by increasing mode share for rail and coastal shipping and lowering emissions of new heavy vehicles.
14. Government to develop a plan to reduce vehicle-kilometres travelled.
15. More compact urban areas, based around public transport routes, need to be encouraged.

V. A low carbon regional public transport network

In terms of inter-regional travel the CCC does not adequately address the potential for modeshift. Regional transport policy debates often pits technological market driven optimists against those who argue for a need to support significant mode shift. Under the first option, the main tools would involve a major shift to electric cars, perhaps eventually self driving, and a rapid move by all domestic airlines to, as yet commercially unproven, electric or hydrogen powered planes. This seems to be the option

promoted by the Climate Change Commission. Some promoters of this vision support further road building and, sometimes, subsidies to airlines and airports.

The alternative concept is a shift to far more travel by train, bus and ferry. This is the model being pursued by many European nations and the model we favour. Not only does this have emission reduction benefits, but more ably fits the goal of a just transition as it provides more affordable travel and reaches into more areas of New Zealand.

It is clear that by far the lowest carbon forms of travel are trains and buses, particularly if these are powered by electricity.

A behavioural shift by New Zealanders who want to reduce their emissions by using these forms of travel is currently very difficult. Through a combination of changing consumer demand, and policy shifts, including shifting subsidies from rail to road and airports, New Zealand's once extensive regional train network has been destroyed. A regional bus network still exists, but it is of poor quality and is currently not an attractive form of travel for most New Zealanders.

2021 is designated as European Year of Rail by the European Commission. A German study [Germanwatch] suggests that rail could play a key role in the future transport system because "it is clean, safe and reliable, and it could become a symbol for the European Green Deal". It goes on to promote the idea that "a strengthened European rail system could (1) better connect people and businesses in Europe, (2) reduce transport emissions by creating alternative options to road transport and aviation, and (3) give a green boost to the European economy post-Covid-19."

The German study suggests the biggest rail related gains can be made by focusing first on areas with the largest populations. This supports the need to develop fast rail between Auckland, Hamilton and Tauranga, an idea originally promoted by the urban blog Greater Auckland in 2017. There has also been much discussion about better rail services between Wellington and Palmerston North, between Wellington and the Wairarapa and connecting Christchurch to nearby urban areas, and a night train between Auckland and Wellington. Creating this network will have long-term benefits.

While rail is important, the role buses already play is often overlooked. For example, in Germany while regional rail services have declined there has been strong growth in long distance buses travel since deregulation in 2013. However, long distance buses were not mentioned in the draft Climate Commission report.

In New Zealand long distance buses, most run by the privately owned InterCity company, already link all major urban areas with most small towns and rural areas. Where trains do not run, or planes do not fly, buses allow people to move within or between regions.

Buses are already a very low carbon form of travel. Using biodiesel is already feasible. And technology is advancing rapidly so they can further reduce emissions by turning to electricity or hydrogen. Already overseas bus companies are experimenting with long distance electric buses.

However, key parts of the infrastructure supporting this bus network are very poor, examples being New Zealand's largest and most important bus station in central Auckland and the key tourist destination and

interchange in Taupō. Bus passengers have to endure facilities which have long been deemed unacceptable for those flying.

The actual buses are also not keeping up with best practices overseas. While long distance buses in most developed nations have on-board toilets, our buses generally do not. Increasingly overseas buses are being designed to be easy for disabled people to use. Our buses do not easily carry bikes, skis or surfboards. It should be easy to reach New Zealand's tourism-focused cycleways by bus (or train).

The low quality and high price of our present regional public transport network increases emissions and makes it more difficult for households to reduce their number of cars. It is also a source of transport poverty amongst people who do not drive.

Significantly upgrading this network to make it more attractive would be relatively low cost and could occur quickly. It would be a contributor to a just transition.

Recommendations

1. Encourage mode shift to long distance buses and trains through legislation and funding decisions. Begin with the low-hanging fruit which includes re-establishing an overnight train between Auckland and Wellington.
2. Ask the government to work towards re-establishing a sustainable environmentally friendly integrated national public transport system for 'turn up and travel' travel whether it is by long distance bus, train and/or ferry services across all 16 regions of New Zealand
3. Create a national open 'tap and travel' payment/ticketing system that is operative across all 16 regions in New Zealand
4. Establish a national information and timetable website and associated smart phone travel app that contains all 'turn up and travel' and 'book and travel bus/coach, rail and ferry travel across all 16 regions in New Zealand
5. Suggest the creation of a national public transport agency for the funding, planning procurement and guidelines for urban, semi-rural, rural, regional and inter-regional bus/coach, train, light rail and ferry services in association with the agency's city, district and regional council partners
6. Create a set of minimum standards for long distance coaches and the infrastructure that supports them.

VI. ETS and meeting the budgets

We support the advice on the ETS, including its pricing recommendations which are in line with international evidence as to the carbon prices that will be required for climate goals.

There are remaining areas of uncertainty as to the effectiveness and impact of the ETS, especially as its impact begins to bite and prices rise. The operation of the containment reserve, and how it allows budgets to be met, has not been spelled out yet. If prices rise, the carbon liability in forests may become

significant and could exceed the value of the land. It is not clear where this liability enters into the carbon accounts or models. It may become necessary to have a separate price for forestry. Fundamentally, the linkage of the ETS with forestry (in which new areas of pine forestry receive payments for the early years, then nothing, but bear the responsibility to maintain the store of carbon indefinitely) remains untested over the long periods required.

The large volume of banked credits creates a risk that the ETS will not keep actual emissions below the cap. This has been a problem in other ETSs as well. For example, Inman *et al.* conclude that in California, “Oversupply conditions persist across a range of modeled emission scenarios and could enable emissions to greatly exceed program caps in the mid-to-late 2020s.” [Inman]

At present, greenhouse gas emissions are reported 28 months after the start of the calendar year in which they occur. Trends could take much longer again to become apparent. Forestry trends, decades. There is a risk that goals could be missed by decades, and from our poor record in the past this would not even be surprising.

The units released under the ETS is one mechanism for interacting with observed emissions; it looks like none of the other policy suggestions in the Draft Advice have mechanisms for gathering evidence on their impact and adjusting their settings quickly and appropriately. But data is available. For example, monthly data on fuel and vehicles sold provides rapid feedback on the impact of transport policies.

Recommendations

1. Ensure that banked ETS credits do not interfere with its effective operation.
2. Explore mechanisms to monitor and adjust other policies as necessary.

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