

Submission to the Ministry for the Environment

Te hau mārohi ki anamata - Transitioning to a low-emissions and climate-resilient future

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Submitters: Paul Callister (paul.callister@outlook.com)
and Robert McLachlan (r.mclachlan@massey.ac.nz)

Paul Callister lives in Kāpiti and is an economist and Honorary Research Associate at the Institute for Governance and Policy Studies, Victoria University of Wellington.

Robert McLachlan FRSNZ lives in Palmerston North and is Distinguished Professor in Applied Mathematics, School of Fundamental Sciences, Massey University.

We consent for our submission to be made public.

Together we write on climate, transport, and environmental issues in a range of media. Some recent publications are

1. David Hall and Robert McLachlan, Why emissions pricing cannot do it alone, November 2021, <https://blog.planetaryecology.org/2021/11/16/why-emissions-pricing-cannot-do-it-alone/>

2. Paul Callister and Heidi O’Callahan, How to decarbonise New Zealand’s transport sector, March 2021, https://www.researchgate.net/publication/350290155_How_to_decarbonise_New_Zealand's_transport_sector

3. Paul Callister and Robert McLachlan, Electric aircraft – coming soon to save us, or all hype and greenwash?, October 2021, <https://blog.planetaryecology.org/2021/10/23/electric-aircraft-coming-soon-to-save-us-or-all-hype-and-greenwash/>

Further publications are archived at <https://blog.planetaryecology.org>.

Fifty years ago, on 26 November 1971, the film “[Notes on a New Zealand City: Wellington](#)”, directed by Paul Maunder, premiered on Wellington TV. The narrator asks if Wellington’s future will involve suburban sprawl, traffic, motorways, suburban shopping malls, and the decentralization of employment; or an alternative vision of medium-density apartments bringing a diversity of people into the inner city to live, work, and let their children watch the then-brand-new Cuba Street splash buckets. (And ride bicycles, many of which can be seen in the film.)

Although climate change isn’t mentioned in the film, the relevance could not be clearer. The extreme unsustainability of the path that was chosen fifty years ago is now understood in far greater detail. The necessity to rapidly and permanently reduce greenhouse gas emissions is merging with a renewed focus on the health, equity, community, biodiversity, and resource sustainability aspects of our cities, houses, transport, natural world, and industry – our entire way of life.

Thank you for the opportunity to submit on *Te hau mārohi ki anamata - Transitioning to a low-emissions and climate-resilient future*.

1. Do you agree that the emissions reduction plan should be guided by a set of principles? If so, are the five principles set out above the correct ones? Please explain why or why not.

Under “A fair, equitable, and inclusive transition”, add:

“recognise that some individuals, companies, and activities are responsible for more present and historical emissions than others and that they should reduce their emissions more.”

See e.g. Nielsen et al., The role of high-socioeconomic-status people in locking in or rapidly reducing energy-driven greenhouse gas emissions, Nature Energy 2021

<https://www.nature.com/articles/s41560-021-00900-y>, and below for more details.

Add two new principles:

“Prioritise permanent gross emissions reductions over temporary reductions and temporary sequestration; prioritise actions that hasten the phase out of the burning of fossil fuels for energy”

and

“As well as reducing the supply of GHG-intensive products, focus in addition on reducing demand, via changes in consumption, shifts to low-GHG alternatives, and the provision of public goods essential for wellbeing.”

There is a vast literature on this topic, not touched on at all in the ERPDD. See question 47 below.

Ketan Joshi has stated that “incentivized and enriching lifestyle change will be a powerful part of any pathway to 1.5 °C”, pointing to the IEA’s 2021 World Energy Outlook report, which states (<https://iea.blob.core.windows.net/assets/888004cf-1a38-4716-9e0c-3b0e3fdbf609/WorldEnergyOutlook2021.pdf>)

“Raising the level of climate ambition, however, requires more from consumers than a systematic preference to buy clean technologies. They also need to change behaviour to reduce their energy consumption and emissions footprint. In our scenarios, behavioural change refers to ongoing changes (which may be either brought about by regulations or voluntary) in the way that consumers use energy in daily life. In addition to energy-related behavioural changes, pathways assessed by the IPCC which limit warming to 1.5 °C, as well as some national net zero plans, rely substantially on non energy-related behavioural changes, such as a shift towards lower meat diets, to reduce GHG emissions across the whole economy.”

2. How can we enable further private sector action to reduce emissions and help achieve a productive, sustainable and inclusive economy? In particular, what key barriers could we remove to support decarbonisation?

We have been in a kind of stand-off period in which large emitters have been increasing emissions in some areas, making token efforts in others, while lobbying against stronger government action. Hopefully we are nearing the end of this period, but I wouldn’t put it past the large emitters to come up with new strategies for delay and new ways to waste resources.

Recommendations

- a. Require companies with majority state ownership to support government policy, e.g. for 100% renewable electricity
- b. Prevent excessive influence of the private sector on policy development (e.g. the Motor Industry Association).
- c. The proposed carbon budgets are a barrier – they are too high. First, the CCC's methodology is unsound and is being challenged in court; second, between their draft and final budgets they allowed the increase in 2019 emissions to be grandfathered in, rather than compensated for; third, it exposes us to costs and risks under the NDC; fourth, they leave too much of the 2050 goal to the later decades. Much, much more should be done in the 2020s. In the first carbon budget, the closure of Marsden Point is an example of leakage. It just shifts emissions to Singapore and does nothing to reduce the total remaining emissions of liquid fuels in New Zealand. (2019 emissions from oil refining were 882,000 tCO_{2e}.) An event like this should be an automatic trigger to lower the remaining carbon budgets by the equivalent amount.

3. In addition to the actions already committed to and the proposed actions in this document, what further measures could be used to help close the gap?

- a. Preparatory work for international aviation and shipping. These are included in the Paris Agreement's climate goals, are needed to support the effort to limit warming to 1.5°C, and will likely enter national accounts and targets eventually.
- b. A plan to significantly reduce domestic aviation emissions by both supporting modeshift away from flying and decarbonising flights through adoption of SAFS.
- c. Actions to reduce the emissions of high emitting individuals.
- d. Actions to avoid leakage and to reduce the embodied emissions of imports.

4. How can the emissions reduction plan promote nature-based solutions that are good for both climate and biodiversity?

Support planting on all suitable publicly owned land. This includes surplus land from public works projects, such as the 400 hectare former Perkins farm bought as part of the Transmission Gully project. Support wetland restoration projects.

5. Are there any other views you wish to share in relation to the Transition Pathway?

It is not ambitious enough, especially with regard to fossil fuels, because:

- a. The evidence in the legal claim of Lawyers for Climate Action
- b. Reducing fossil fuel burning 27% by 2030, and 75% by 2050, does not meet the 1.5°C goal even on a global average
- c. It does not accept our historical responsibility since 1850.
- d. It does not accept our historical responsibility since 1990.
- e. It is less ambitious than other countries; it is not our "highest ambition".

f. It exposes us to a large international bill to meet our NDC, with associated financial and emissions uncertainty. Aiming to meet more of the NDC domestically would avoid this cost and risk.

g. It does not contain a margin of error - it is likely that we will miss even the draft targets. Note that the ERPDD does not yet meet the first budget, and does not even estimate whether it will meet the second budget.

h. It pushes the big reductions in fossil fuels out to the 2030s and 2040s and relies on not-yet-existing technology to meet a part of them.

13. Do you agree with the objectives for an Equitable Transitions Strategy as set out by the Climate Change Commission? What additional objectives should be included?

Add an objective to reduce emissions of high-emitting individuals and households. This is where the big reductions have to come from: poorer households have very low emissions anyway, while the high-emitting households have more emissions to cut and more ability to pay.

A 2020 study (The unequal distribution of household carbon footprints in Europe and its link to sustainability, D Ivanova and R Wood, Global Sustainability , Volume 3 , 2020 , e18 DOI: <https://doi.org/10.1017/sus.2020.12>) found that half of EU households emit an average of 5 tonnes per person; the middle 40%, 10 tonnes; the top 10%, 23 tonnes; and the top 1%, 55 tonnes CO₂e per person. Air travel is strikingly unevenly distributed. 90% of EU households have air travel emissions averaging 0.1 tonnes per person; 9% average 0.8 tonnes; and the last 1% average 22.6 tonnes.

Reducing household emissions requires high-emitting households to reduce more.

Statistics New Zealand are preparing data on the distribution of household emissions.

Aviation is one area in which emissions rise more steeply than incomes. Citizens' Climate Assemblies overseas have tended to support frequent flyer levies as a just approach in this area.

Add an objective that climate policies should be assessed on their distributional impacts and regressivity/progressivity. Regressive policies require compensation or amelioration (as is already being considered), progressive policies should be favoured.

16. How can Government further support households (particularly low-income households) to reduce their emissions footprint?

This is backwards. The low-income households don't need to do much for now. Change this question to "How can Government ensure that high-income households reduce their emissions footprint?"

23. Is there anything else you wish to share in relation to government accountability and coordination?

Faster emissions reporting (e.g. quarterly) and emissions forecasts are indeed desirable, but what seems to be missing is feedback into policies and actions. e.g. periodically adjusting the levies in the

Clean Car Standard to ensure that its targets are met; adjusting regional transport spending in response to observed transport emissions reductions.

24. What are the main barriers or gaps that affect the flow of private capital into low-emissions investment in Aotearoa?

Case study 1: Fonterra. They've just made a record payout to farmers, but they are planning to burn coal until 2037 and to not start phasing out gas until after 2037. Until two years ago they wouldn't even mention coal in their reporting. The barrier is that they are focussed on profit and not on environment. The food industry could be net zero for processing by the late 2020s but this will require a bigger stick than the ones being used now.

Case study 2: Electricity. The industry is run for the benefit of the large generators who have repeatedly delayed an end to coal and who have failed to build new renewable capacity despite hefty profits. But until recently there have been few new market entrants - perhaps the consents which the big generators were sitting on put them off. Even now Genesis Energy has not committed to building their consented wind and solar farms. Instead, they fight government policy through the media. Again, the main barrier is that the industry is hostile to the environment and needs stronger regulation.

Case Study 3. No community wind farms have been built in NZ. In Paekakariki a group has been wanting to build turbines on a prime wind site that is owned by NZTA. Despite multiple meetings with officials and Ministers no progress has been made on the seemingly simple requirement for an easement on the land. Government needs to remove barriers to building community owned windfarms. (See Berka, A. L., MacArthur, J. L., & Gonnelli, C. (2020). Explaining inclusivity in energy transitions: Local and community energy in Aotearoa New Zealand. *Environmental Innovation and Societal Transitions*, 34, 165-182.)

Barrier 3: No industry-wide plans for decarbonisation.

Barrier 4: Threat of leakage.

27. Is there anything else you wish to share in relation to funding and financing?

Households have \$200 billion sitting in the banks, mostly on term deposits earning low returns (and record profits for the banks). Why are they happy with 1% at the bank but not 10% on rooftop solar power? Meanwhile the banks lend the money out to inflate the housing market.

30. Do you agree the treatment of forestry in the NZ ETS should not result in a delay, or reduction of effort, in reducing gross emissions in other sectors of the economy?

Yes.

But it is resulting in a delay, and it has been for 30 years. There should be separate pathways and mechanisms for forestry, as we now have for biogenic methane.

In addition to the factors noted in the ERPDD, 1 tonne CO₂e of forestry compared to 1 tonne CO₂e of fossil fuel reduction:

- is less valuable because it reduces the pressure to reduce fossil fuels
- is less valuable because it is temporary rather than permanent
- is less valuable because it does not contribute to, and in fact detracts, from the overall transition
- is less valuable because the carbon liability does not appear in the present carbon accounting system. In theory it lies with the forest owner, in practice they are ignoring it. If it gets closer to falling due, they will be motivated to change the system in their favour.

See also the discussion of emissions vs removals in Wim Carton et al., Undoing Equivalence: Rethinking Carbon Accounting for Just Carbon Removal, Front. Clim., 16 April 2021, <https://doi.org/10.3389/fclim.2021.664130>.

31. What are your views on the options presented above to constrain forestry inside the NZ ETS? What does the Government need to consider when assessing options? What unintended consequences do we need to consider to ensure we do not unnecessarily restrict forest planting?

They are all plausible on the face of it. We need to assess the actual value of plantation forestry sequestration compared to fossil fuel reduction in light of the above factors. Perhaps the ratio is of the order of 1:3.

It is argued in the ERPDD that permanent forests are needed for "hard to abate" sectors. But this is only because a very narrow definition of "hard to abate" has been adopted. For example, aviation is only "hard to abate" when demand - by far the single most important factor - is ignored. Likewise, cement and metal processing may be "hard" (or more expensive) to abate, but they can also be subject to demand reduction, e.g. by product substitution or by reducing consumption.

The whole idea of leaving "difficult" sectors for later, or ignoring them, needs to be abandoned and replaced by a clear message that fossil CO2 emissions need to be stopped.

The present strategy, of leaving a quarter or more of fossil CO2 emissions for the second half of the century, leads to all sectors thinking that they can be that quarter.

32. Are there any other views you wish to share in relation to emissions pricing?

Yes – We're still angry about the "hot air" scandal. The government and industry participants have not accounted for their responsibility for this scandal and its international repercussions. It also contributed to mistrust of ETS in some circles.

34. What more do we need to do to promote urban intensification, support low-emissions land uses and concentrate intensification around public transport and walkable neighbourhoods?

Palmerston North, Horowhenua, and Kāpiti councils are all planning major sprawl and green fields development unsupported by public or active transport. Probably, this is replicated all across the country (see Tauranga's "SmartGrowth" plan). The entire system needs to change.

Many local authorities still have a "can't do" attitude towards rolling out the extensive cycling/walking networks needed to support a safe (and enjoyable) shift out of car dependency. We see significant roll out of cycleways/walking infrastructure in places such as Paris, London and many other European cities. We even see this in unexpected places such as Austin Texas (<https://www.peopleforbikes.org/news/austin-will-be-americas-next-great-biking-city>). There needs to be a major shift in central and local government attitudes and funding to facilitate building of this infrastructure. Currently climate and cycling advocates fight local authorities crossing by crossing, for

each car park removed, and to fight for road space to be used for safe cycling. These advocates are burning out and need support.

There is a particular lack of regional planning, e.g. in the Wellington-Palmerston North corridor, where each council is mostly concerned with activities inside its boundary, but their local plans will be undone by outside events such as the new motorways.

36. What are the big challenges, particularly around technology, that a mission-based approach could help solve?

100% renewable energy by 2050. That's what we need but it is not even on the radar at the moment.

40. What are the opportunities for innovation that could generate the greatest reduction in emissions? What emissions reduction could we expect from these innovations, and how could we quantify it?

Reducing excessive and wasteful consumption.

41. Are there any other views you wish to share in relation to research, science and innovation?

There seems to be no research in New Zealand at all on regional transport. It needs a systems view encompassing aviation, rail, car, bus, and demand.

In the 2021 Global Energy Innovation Index: National Contributions to the Global Clean Energy Innovation System (<https://itif.org/publications/2021/10/18/2021-global-energy-innovation-index-national-contributions-global-clean>), New Zealand ranked 33rd out of 34 countries. But some data is missing or old so this ranking may not be reliable. Nevertheless, the methodology of the study and the policies of the high-ranking countries could be relevant here.

42. What information, tools or forums would encourage you to take greater action on climate change?

Information for sellers and buyers targeted at point-of-sale, e.g. car and petrol sellers. The car and petrol sellers have not yet accepted their share of responsibility for our transport emissions trajectory.

Information about the role of collective action in addressing climate change.

47. What should a circular economy strategy for Aotearoa include? Do you agree the bioeconomy should be included within a circular economy strategy?

It should include a focus on reducing excessive and wasteful consumption. See, e.g., Socio-economic conditions for satisfying human needs at low energy use: An international analysis of social provisioning Jefim Vogel, Julia K. Steinberger, Daniel W. O'Neill, William F. Lamb, Jaya Krishnakumar 2021 <https://www.sciencedirect.com/science/article/pii/S0959378021000662>, and references therein on the "decent living" approach to sustainability. Invite Steinberger to give an address!

It should include a focus on embodied and lifecycle emissions of imports, e.g. cars.

52. Do you support the target to reduce VKT by cars and light vehicles by 20 per cent by 2035 through providing better travel options, particularly in our largest cities, and associated actions?

There are some problems with this.

The 40% reduction by 2035, as in the MoT Green Paper, is better overall, with greater co-benefits.

It should be clarified which agency is responsible for delivering the VKT reduction.

It should not be just in the major cities. Small cities have good bus networks already and the distances are smaller. The Wellington-Palmerston North corridor, with numerous small cities and towns but with many long-distance commuters, shows that regional transport is important too.

Reducing the growth of vehicle numbers is another useful tool to reduce VKT. Increasing vehicle numbers, partly as a result of the effective subsidising of private cars, is a major cause of increasing transport emissions. A move towards private cars paying their way is welcome.

On regional transport, we need a national regional public transport body; integrated scheduling and ticketing; cheaper fares for poor people; and regional passenger rail included in the Rail Plan. As well as helping non-drivers, better regional transport makes it easier for households to reduce their number of cars.

Much stronger tools will be required to ensure compliance from councils. For example, transport funding should be tied to achieving reductions in transport emissions and subsidiary targets.

Congestion pricing has potential, but it also risks unlocking extra demand at peak periods, and shifting travel to off-peak where it conflicts with active and public transport. Essentially, all transport has to be priced appropriately.

The subsidies to drivers identified by Concept Consulting ("Cost-effective energy options for transitioning New Zealand to a low-carbon economy", a report for the Parliamentary Commissioner for the Environment, 2017) should be removed.

The criteria for motorway tolls should be reviewed. This is a tool that already exists and can act to regulate demand.

The impact of lower speed limits on emissions (including from reduced demand) should be included. What is the emissions impact (including from reduced demand) of lowering all state highways without a central barrier to 80 km/h immediately?

53. Do you support the target to make 30 per cent of the light vehicle fleet zero-emissions vehicles by 2035, and the associated actions?

No, we support 30% by 2030.

54. Do you support the target to reduce emissions from freight transport by 25 per cent by 2035, and the associated actions?

No, we support 50% by 2035.

The Rail Plan does not mention a target for rail freight mode share. Needs a higher target and a pathway to reach it.

Need massive public investment in electrification – the 70% emissions reduction in shifting from truck to diesel train is not enough.

Need more emphasis on reducing deaths and serious injuries from freight (e.g. trucks, railway crossings).

55. Do you support the target to reduce the emissions intensity of transport fuel by 15 per cent by 2035, and the associated actions?

Yes, but we are concerned that the challenges are pretty steep. The biofuel consultation seemed to be focussed on food-to-fuel, and few of the suggested biofuels have big enough reductions in lifecycle emissions. Too much reliance on unproved technologies (e.g. cellulosic biofuels, e-fuels) to be confident yet.

56. The Climate Change Commission has recommended setting a time limit on light vehicles with internal combustion engines entering, being manufactured, or assembled in Aotearoa as early as 2030. Do you support this change, and if so, when and how do you think it should take effect?

Yes. It should take effect in 2030. The Clean Car Standard puts us on track for this.

Specifically, only BEV and PHEV should be permitted from 2030, and only BEV from 2035.

57. Are there any other views you wish to share in relation to transport?

Yes.

57.1. You didn't ask a question about aviation!

Aviation is a large and growing source of emissions that needs closer study. It's 9% of New Zealand's CO2 emissions – not a small sector.

The top 6 countries for domestic aviation emissions per capita are (<https://ourworldindata.org/carbon-footprint-flying>):

United States	385.52 kg
Australia	267.17 kg
Norway	209.23 kg
New Zealand	174.19 kg
Canada	168.27 kg
Japan	73.96 kg

Most developed countries are in the range 20-60 kg. The US, Australia, and Canada are very large. New Zealand and Norway are clearly outliers.

Aviation emissions are dominated by a small number of wealthy frequent fliers. This has been repeatedly confirmed internationally and is probably true in New Zealand as well, although it would be worthwhile to research this area.

Moreover, this is for CO2 only. The non-CO2 effects are twice as large again, and these should be included when considering aviation policy.

The industry is planning for growth, with a new airport planned for Tarras, and big expansions planned for Wellington and Auckland. Auckland Airport is also building a new \$1 billion domestic terminal. Increase comfort and convenience leads to more travel and more emissions. Air New Zealand has increased its regional flights 50% since 2012 and is planning a further 10% increase.

Speculatively, could it be possible that aviation is a blind spot of the Koru-club dwelling, frequent-flying political and policy-making classes?

The top 6 countries for international aviation emissions per capita are:

Iceland	3,505.6 kg	
Qatar	2,472.7 kg)	
UAE	2,195.1 kg)	A lot of this is associated with refuelling for transit passengers
Singapore	1,741.0 kg)	
Malta	991.6 kg	
New Zealand	640.3 kg	

While this is not included in the domestic carbon budgets, it is included in the Paris Agreement targets for global warming, and supporting these is the overarching purpose of the Zero Carbon Act. The IATA, of which Air New Zealand is a member, has a target of net zero emissions by 2050. There is nothing to stop any country regulating aviation emissions now.

Some look to ICAO to act on international aviation emissions. But an ICAO spokesperson said (The Guardian, 30 June 2021) "The responsibility for cutting emissions from all sectors of human activity, including but not limited to aviation, lies clearly and unambiguously with the states. ICAO is a standard-setting body, and the role of the ICAO secretariat within the aviation sector is strictly to provide impartial technical assistance to states in the development and agreement of these standards." Dan Rutherford of the ICCT commented that "ICAO has been analyzing climate change for almost 25 years and has yet to recommend a single measure to directly reduce GHGs from planes. Every country today saying that it should take the lead on international emissions knows this perfectly well."

As with land transport, the ETS is not an effective tool for aviation (although its absence from international transport doesn't help).

We cannot rely on new technologies. Firstly, they don't exist yet, and secondly, if they do materialise, they cannot be adopted quickly enough to meet climate goals.

The main factors that influence emissions are demand, efficiency, and the carbon intensity of fuels. There is a small amount left to gain from efficiency (e.g. we could replace jets with turboprops domestically) but mostly we have to look at demand and Sustainable Aviation Fuels (SAF). A new study (Klöwer et al., 2021. Quantifying aviation's contribution to global warming, <https://doi.org/10.1002/essoar.10507359.1>) finds that aviation's contribution to warming can be capped either by reducing demand 2.5% per year, or by returning to 3% growth but reaching 90%

SAF by 2050 (the EU is looking at 63%), or by some combination of the two. New Zealand's aviation emissions have grown 2.8% per year since 1990.

The energy requirements for New Zealand to supply aviation with biofuels, e-fuels, or hydrogen, are staggering. If that is our preferred pathway, we need to start planning now.

Recommended actions:

- a. Price floor on domestic air travel. Ultra-cheap fares (loss leaders) act to increase demand and emissions.
- b. Clarify the national strategy on airport expansions and require them to meet climate goals, including on the emissions of the aircraft that use them.
- c. Adopt the recommendations of the Parliamentary Commissioner for the Environment, recognising that these are only a tiny first step.
- d. Improve low-emission alternatives, e.g. regional bus and rail.
- e. Ensure that the bodies developing policy in this area are balanced and are not “industry led” as proposed in the ERPDD.

57.2 Inter-regional road and air travel are significant contributors to GHG emissions and do not pay their full environmental costs. Inter-regional road travel has been promoted by an extensive highway building program. In New Zealand, regional air services are often heavily subsidised. For example, all of Air Chatham's routes are subsidised by central or local governments. Subsidising a carbon intensive form of travel that tends to be used by the higher income members of society should not occur in a climate emergency.

Much hope is placed on technological innovations that will allow domestic aviation to decarbonise. This includes the introduction of electric planes and the use of biofuels. But none of these advances will realistically reduce emissions through to 2030. In addition, air travel will require significant amounts of renewable energy that could be better used to decarbonise other parts of the economy.

In contrast, low carbon, low energy use alternatives already exist, namely passenger trains and long distance coaches. Such services could be rapidly expanded before 2030.

Regional rail services need to be rebuilt in New Zealand. The current services are very limited with long distance rail limited to expensive and unreliable tourist trains. Train travel needs to be affordable in a just transition.

Rapid rail between Auckland, Tauranga and Hamilton needs to be built as well as rapid rail between Wellington and Palmerston North. An overnight train between Wellington and Auckland needs to be re-established. Trains need to be designed to carry bicycles.

Long distance coaches are already an important, and low carbon, part of regional travel in New Zealand. But compared with services provided in other advanced economies, both the buses and the supporting infrastructure need significant improvement. This would not require a large investment. Given that these services often link poor and deprived communities, improving these services needs to be part of a 'just transition'.

Improvements include 1. On board toilets 2. Good quality bus stops and bus terminals 3. The ability to carry bicycles 4. Better integration into the inter-regional train network and urban public transport networks.

57.3. The target for emissions reductions in transport are too low. New Zealand is planning to reduce transport emissions from 16 Mt to 14 Mt by 2030; Ireland, with the same population, is planning to reduce from 12 Mt to 6-7 Mt by 2030. The ERPDD identifies 0.22 Mt reductions over 4 years (2022-2025) and says that's good enough; the Irish plan identifies 2 Mt per year by 2025, 5 Mt per year by 2030, and is looking for another 1 Mt.

Either the Irish plan is completely bogus, or the New Zealand plan is hopelessly unambitious, or some combination of the two.

We could do worse than inspect the hundreds of action points in the Irish plan.

For example, in the Irish plan there is a remark that "The National Transport Authority helped over 150 large employers and 23 campuses nationally, covering over 250,000 employees, develop Mobility Management Plans. Where workplaces actively engaged with their Workplace Travel Plan, an average reduction in car commuting of 18% has been recorded."

The UK active transport strategy ("Gear Change: A bold vision for cycling and walking") is full of good ideas. It ties local road funding to the completion of cycling and walking projects.

57.4. For years, the transport planning process has been disingenuous, with a disconnect in the RLTPs between the fine words and worthy goals in the opening sections and the actual spending revealed at the end, which are not aligned the goals. I am concerned that we may be repeating this process, as some of the items discussed in the ERPDD, and being described as underway (e.g. Tackling Unsafe Speeds) are not at all transformational enough for what is required. Transport funding needs to be more directly tied to achieving the higher-level goals.

57.5 Instead of banning high-emission vehicles, a more flexible approach could be to introduce CO₂-linked annual registration fees, especially for high-emitting vehicles. There could be a big discount for vehicles first registered before a certain date.

58. In your view, what are the key priorities, challenges and opportunities that an energy strategy must address to enable a successful and equitable transition of the energy system?

It must be focussed on ending the burning of fossil fuels.

60. What level of ambition would you like to see Government adopt, as we consider the Commission's proposal for a renewable energy target?

100% renewable energy by 2050, rising 20 percentage points per decade from the present 40%.

(In Sweden each sector is preparing a pathway to meet the target of being fossil-fuel free by 2045.)

This is what the Paris Agreement requires. It will involve vastly more renewable energy (although less total energy use than today), mostly wind and solar.

We are starting to see plans for utility-scale solar, and costs reducing closer to levels seen in Australia, but solar potential is still a blind spot. MBIE (<https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-statistics-and-modelling/energy-modelling/interactive-levelised-cost-of-electricity-comparison-tool/>) puts solar at 7c/kWh, and wind

at 6c, but despite this does not foresee any solar being built in the next 3600 MW of generation. Clearly this is already out of date. One 100% renewable study put New Zealand's demand for solar at 20 GW by 2050. (Bogdanov et al 2021, Full energy sector transition towards 100% renewable energy supply: Integrating power, heat, transport and industry sectors including desalination, <https://doi.org/10.1016/j.apenergy.2020.116273>) That's how much Australia has installed in the past five years. What is holding us back?

Until we adopt such a target, we are going to continue to see the various parties manoeuvring to delay and shift responsibility.

63. Are there any issues, challenges and opportunities for decarbonising the industrial sector that the Government should consider, that are not covered by existing work or the Commission's recommendations?

The 1,021,000 tonnes CO₂e of fugitive fossil fuel emissions could be stopped by phasing out that industry, which needs to end in any event. This source of emissions receives a name check in the ERPDD but no action is suggested.

68. What level of support could or should Government provide for development of low- emissions fuels, including bioenergy and hydrogen resources, to support decarbonisation of industrial heat, electricity and transport?

This is a difficult and alarming question. The prospect of support incentivises industrial emitters to delay and to bargain for more direct support. But some of them will actually need some support. Many of them (e.g. in horticulture, food processing, electricity) should be required to show much more genuine effort and make much more rapid decarbonisation goals in return for state support.

We haven't seen this discussed in the ERPDD or elsewhere, but New Zealand appears to have relatively high industrial emissions. The world share for industrial emissions, as a proportion of non-agricultural, non-LULUCF emissions, is 36%, which includes the emissions of electricity used for industry. The EU is at 15%. New Zealand's share is 36% plus the emissions of electricity. To slice it another way, New Zealand's industrial emissions are about 3 tonnes CO₂e per person, compared to 1.8 tonnes in the US and 1.1 tonnes in the EU.

Is New Zealand's present industrial strategy sustainable, given the required end point of not burning fossil fuels?

69. Are there any other views you wish to share in relation to energy?

Our poor track record on energy efficiency suggests that mandates (e.g. building codes, fuel bans) should remain a focus.

73. The Government is developing options for reducing fossil fuel use in industry, as outlined in the Energy and industry section. What are your views on the best way to address the use of fossil fuels (for example, coal, fossil gas and LPG) in boilers used for space and water heating in commercial buildings?

Mandates. End coal by 2030 or earlier where possible, gas by 2035.