

# Submission on New Zealand's Intended Nationally-Determined Contribution

Dave Frame

## Structure of international and national policy targets

This submission is mainly about the relationship between different parts of climate policy, international and domestic.

The main points are summarised graphically in the figure(s) appended at the end of the document, which attempts to link international targets, international policy and domestic contributions together.

The idea with the figures is that the different parts should interact clearly and traceably, and that this interaction can be used as a sort of check-list to try to ensure some comprehensive search across relevant areas has been conducted.

Given the propensity of climate policy suggestions in New Zealand to focus either very broadly or very narrowly, I thought that offering some structure – especially one that builds in a conversation between domestic mitigation capacity, domestic policy and international policy – might be of some value.

## International policy

In isolation the existing 2°C target is an insufficient target, in the sense that any single long-term target fails to specify the path to the target, while interim targets leave emissions unbounded in the distant future.

One constructive step along the way to addressing the “long-term emissions gap” that arises from the silence regarding post-2050 emissions would be to agree an aspirational goal of zero net emissions of CO<sub>2</sub> by 2100, with the date subject to revision from time to time as new data on the scale of the climate problem emerges.

This could in principle be supported by a peak emissions rate target. These two emissions targets comprehensively complement each other, since “only two emission targets (peak emission rate and cumulative carbon emissions to 2200) are needed to constrain two key indicators of CO<sub>2</sub>-induced climate change: peak warming and maximum rate of warming.”<sup>1</sup>

This would disaggregate the climate system output target (2°C) into a minimal set of anthropogenic input targets – a long-term net zero CO<sub>2</sub> emissions target and a peak emissions target. These deployment of such supplementary targets would assist in providing some of the global bounds to the notion of “bounded flexibility”, and act as a bridging devices between the 2°C target and the substantive zones of real policy negotiations, which needs to be in the realm of policy, not (just) emissions.

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<sup>1</sup> Bowerman, N.H.A., Frame, D.J., Huntingford, C., Lowe, J.A., & Allen, M.R. (2011). Cumulative carbon emissions, emissions floors and short-term rates of warming: implications for policy. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 369(1934), 45-66.

It is now well-established that you don't stop the warming until after you stop emitting CO<sub>2</sub>. So getting to net zero emissions of those species is a necessary part of stopping climate change; we can argue about the details of the date as we go – this is a function of transient climate response to cumulative emissions, which is something we learn about as we go.

The timing of peak emissions matters less than its magnitude. This will mainly be determined by the contributions of major developing countries, since these are by far the most significant source of emissions in the 21<sup>st</sup> Century.

A peak target is likely to be heavily contested, but if the 2°C target is to mean anything, it needs to have the support of other targets which map temperatures back towards the stuff of policy. If these supporting targets are too onerous, then this tells us something about the over-arching target.

### **New Zealand's International contribution**

At present, a cut of 50% in emissions by 2050 is still gazetted as New Zealand's target. Extending this ambition to a target of net zero carbon dioxide emissions by 2100 would be a valuable addition to the current plan. It would change little in today's actual policy but would be a useful signal of New Zealand's long-term aspiration to decarbonise its economy.

New Zealand could propose to revise this in the coming UNFCCC rounds as other countries formalise their nationally-determined contributions.

New Zealand could also explicitly support the strengthening of institutions which enable countries to coordinate their contributions. New Zealand can offer support to these international institutions in the form of (1) offering support for the development of bilateral and multilateral emissions trading systems; (2) helping develop agricultural and biological technology; experience of managing a low carbon electricity system; (4) wider policy support.

### **More detailed knowledge of mitigation potential across New Zealand**

To make credible promises about emissions reductions, we need to have a better handle on mitigation potential. At present, New Zealand lacks sufficient resources in this area.

Understanding New Zealand's mitigation potential across sectors seems like a priority – the odds of over- or under-mitigating seem high unless we have a detailed knowledge of sectoral capabilities and constraints. Some of this needs to be in-house in Ministries, rather than to come in via the reports of consultants, which are often of diverse quality.

There is a limit to what governments can do in isolation, so creating institutions which give a better understanding of what various sectors think their opportunities and constraints are seems important, and would probably improve business buy-in. Five or so sectors suggest themselves.

### **Sectors**

- **Electricity:** It should be possible to rule out the construction of fossil-emitting electric power generation in New Zealand. New Zealand has abundant renewable potential, and the decline in price of renewable technology shows no sign of stopping. Grid management innovation (e.g. pricing strategies to disincentivise electricity use during peak hours) can assist here, too. If there were to be new fossil fuel capacity in the electricity sector, it could be required to capture and sequester emissions. And it could legitimately incur up-front costs in the

event of future capital investment: since the ETS does not fully internalise the costs of fossil fuel emissions (i.e. formal estimates of the social cost of carbon are considerably higher than an ETS unit price) then it would be reasonable to charge additional fees, up-front, to make up the difference.

- **Transport:** We should support policies that enhance the shift towards non-emitting vehicles, whether these are hydrogen fuel cell cars or electric vehicles. In urban areas, much could be done to improve public commuter transport, and airport to city public transport improvements would assist tourism and make business visits cheaper and more efficient. Companies may find it beneficial to run pilot projects for the development of electric vehicles, and – as certainty around particular infrastructure/networks and so on resolves – to encourage fast uptake. New Zealand is a testing ground in the tech sector and we could play the same role in transport. Biofuels remain a potential area of R&D investment (though I know some have gone cold on this).
- **Industrial heat and energy:** I think this sector is probably more diverse than the others. It is reasonably small in New Zealand, and its effects are more than offset by small changes in the incentives in front of foresters. A higher ETS price – implied either by increased participation in mitigation in other countries, or increasing costs associated with climate change – should see efficiency gains realised, and lead to reductions in fossil fuel use. On the same logic as above regarding the electricity sector, fees for new fossil CO<sub>2</sub>-emitting equipment could be charged as up-front costs: since the ETS does not fully internalise the costs of fossil fuel emissions (i.e. formal estimates of the social cost of carbon are considerably higher than an ETS unit price) then it would be reasonable to charge additional fees, up-front, to make up the difference.
- **Forestry:** A higher ETS unit price, and the phasing out of the one-for-two deal, and improved access to other carbon markets (with units that have some environmental integrity), should incentivise additional forestry initiatives. Given the scale of this sector and its importance in any feasible emissions reduction programme, it may make sense to add a minimum price floor to the ETS to avoid the perverse incentives that can occur when an ETS price is low.
- **Agriculture:** No one in the world has agricultural methane as a working part of their climate policy via an ETS scheme. We shouldn't hold our breath for anyone to do so, either, so whatever policy we come up with will need to be reasonable, but not onerous. Again, we could do more if we see evidence of action from others. I would put a price on nitrogen as part of a joint water quality and climate change initiative. The combination of an explicit price on N<sub>2</sub>O and CO<sub>2</sub> would seem to me to be a good start in a sector where there is substantial policy uncertainty. If methane were to enter the ETS I would use the GTP100 metric value (=4) to assign its relative value compared with CO<sub>2</sub>. This strikes me as a reasonable move, and one that might conceivably be of interest to other countries where agriculture sectors make up a large fraction of the emissions profile. I do not see much of a case for putting methane in the ETS using the GWP100 value (=28).

## Additional policy support

### Skills:

*Invest in climate change education.* Given what other countries' public education systems have done, it's surprising how little there is in the New Zealand school curriculum on climate change.

There is scope for work here. Also I think there's an opportunity to spin up some experts on the central dimensions of climate change science, and a VIA capability, at Tertiary level. There is a poor appreciation of the central physical scientific aspects of the problem, and this has led to underinvestment in adaptation and a surprising approach to mitigation priorities.

***Invest in impacts and adaptation skills*** At the moment (as the Australasian chapter of WGII makes clear) we are surprisingly light on these skills, given the exposure of our economy to even subtle shifts in climate. (I also think building grounded sensible people into councils, industry bodies etc normalises climate change and creates a valuable network of trusted professionals who would help facilitate uptake of a good understanding of various dimensions of climate change.) As well as academics who can work in this area and train new capability, we should do more to support grounded, practical policy people who want to become leaders and pioneers among practitioners

### **ETS reform**

The ETS is a really good idea. And New Zealand has settled on a structure and revisiting this would be unconstructive. But it could do with some tweaks.

1. The low oil price is a good time to get rid of the one-for-two swap.
2. A floor price would realise mitigation potential in the forestry sector.
3. A priority should be to help use our experience to help other countries set up ETS markets, to get mutual benefits from efficient mitigation potential. Motu have done some great work in this area in Chile and Colombia. The units from international markets with which we trade should have environmental integrity.

### **Research and Development**

Comparatively, I believe New Zealand has over-invested in agricultural mitigation and under-invested in CO<sub>2</sub> mitigation, which remains the central problem to be solved, and which remains the basic standard by which we will be judged.

NZ could fruitfully invest in wind, geothermal, tidal and wave power, and these would be investments in CO<sub>2</sub>-mitigation technologies, for which there will be very large markets in coming decades.

I would continue to invest in N<sub>2</sub>O mitigation, but would probably invest less in agricultural methane reductions (unless some amazing new technology really is just around the corner.) Nitrogen is worth thinking about – there are co-benefits, and it really is ~290 times worse than CO<sub>2</sub>, per kilogram. But the case for methane seems weaker to me. Can anyone think of co-benefits to methane reduction? (Other than vegetarians, whose co-benefits are perceived as costs by those of carnivorous tastes.)

We should also invest in more adaptation research, and adaptation support. The National Science Challenges contain some potential vehicles for investment in this area, and future MBIE contestable funds or targeted programs could help realise synergies between these. (at present Challenges have been directed to get their own house in order before attempting to focus on linkages.)

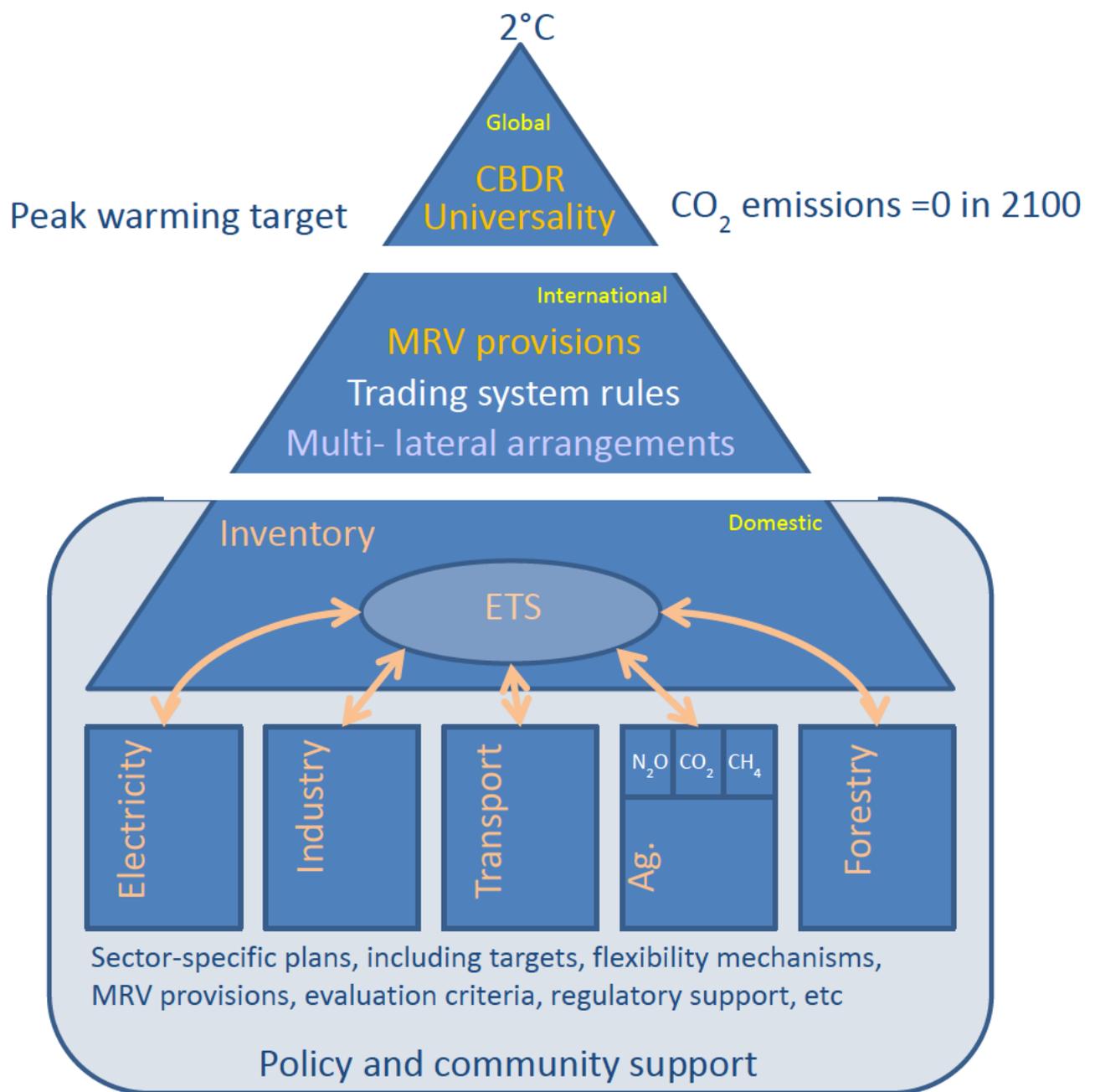
### **Summary**

Governments can regulate, educate and send price signals. New Zealand has spent a lot of time on one of these, has underinvested in the other two, and the consequences are a much-contested and spuriously contested price signal. Price signals are necessary but not sufficient, and the countries I

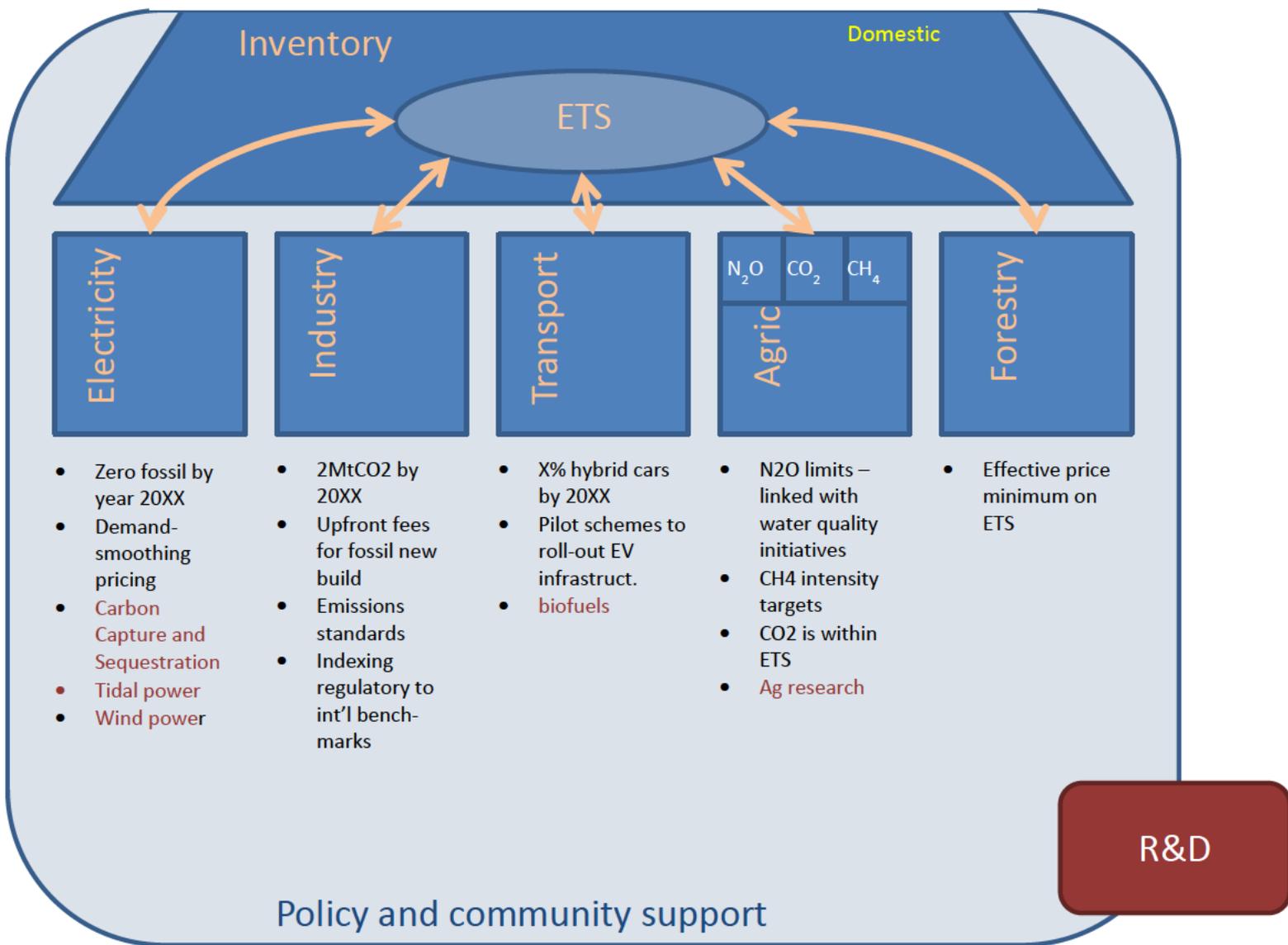
know of which have (comparatively) successful climate policies, there has been a sort of “combined-arms” effort, in which all three moves available to government are deployed to work together towards a common end.

Underinvestment in education and the lack of in depth exploration of regulatory approaches at the sectoral level leaves the ETS a bit exposed – it’s asked to do too much in the absence of clear signals along those other dimensions that the country is serious about climate change. One consequence is that the ETS has too few defenders. People who might be expected to defend climate policy turn their noses up at it. People who might be expected to welcome a low price complain about any price at all. I think part of the failure of the ETS to make much headway is the under-investment in the other legs of the stool.

Ultimately I think the end-game of New Zealand’s domestic policy ought to be to create a policy that can appeal to median voters over a long time. Just as we understand that other long-term policy issues – such as superannuation – are best dealt with in a nonpartisan way, so we should ensure that climate policy is stable and robust. My aim is for bipartisan policies, long-term stability and investment certainty, because decarbonisation is a long-term commitment for New Zealand.



Schematic of potential relationship between global aspirations, international policy institutions and domestic climate change initiatives. The top level contains the over-arching aspirational climate goal; this is supported by two emissions goals which are steps closer to policy than the temperature goal (they are climate system inputs; the 2C goal is a climate system output). These targets are supported by international institutions, some of which (Reporting, Inventory, etc) are prescriptive, while some are contractual (e.g. future bilateral ETS schemes) and some are facilitative (e.g. sharing of information around efficiency, etc). NZ policy should be clear about how it intersects with these different layers of a future climate regime, and should make sure we get credit where we are helping construct those international institutions (for instance by developing institutions others can copy at lower cost regarding the merging of developed and developing country ETS schemes).



Within New Zealand we should make sure that we understand sectoral mitigation potential. I've suggested some ideas, most of which are unoriginal but which seem to me to be reasonable examples of ways in which major New Zealand sectors (from a climate change perspective) could contribute to a more comprehensive, more integrated national programme of climate change mitigation. The ETS is a crucial part of that process, but more could be done to mitigate climate change in New Zealand at comparatively low cost.