

Submission on New Zealand's Climate Change Target for the Paris Conference

By Leslie Jones

This submission on what New Zealand's target should be for the Paris conference looks at three scenarios.

They are all based on one concept, that New Zealand "playing its part in global greenhouse gas reduction," means 'reducing our emissions as much as possible'. It doesn't mean "doing as little as possible while still retaining our international credibility", which is the current government's plan. It also aims to show what we have to do to limit global warming to 2° C.

The emissions which count are those that we actually release into the atmosphere, i.e. the actual or net emissions, therefore all the scenarios use net figures.

Please refer to the accompanying charts illustrating the three scenarios

SCENARIO 1 (the minimum)

Actual (net) emissions reduced to 40% below 1990 levels by 2030. This means making a reduction from 54Mtn (the 2013 actual or net emissions, the latest year for which the official figures are available), or say 58Mtn in 2015, down to 22Mtn in 2030. This requires a more than 62% reduction from now, or 6.5% year on year or reducing by 2.3Mtn for each of the 15 years from now to 2030. This would affect our economy in many ways but it is possible as I will explain later; it would take courageous government decisions.

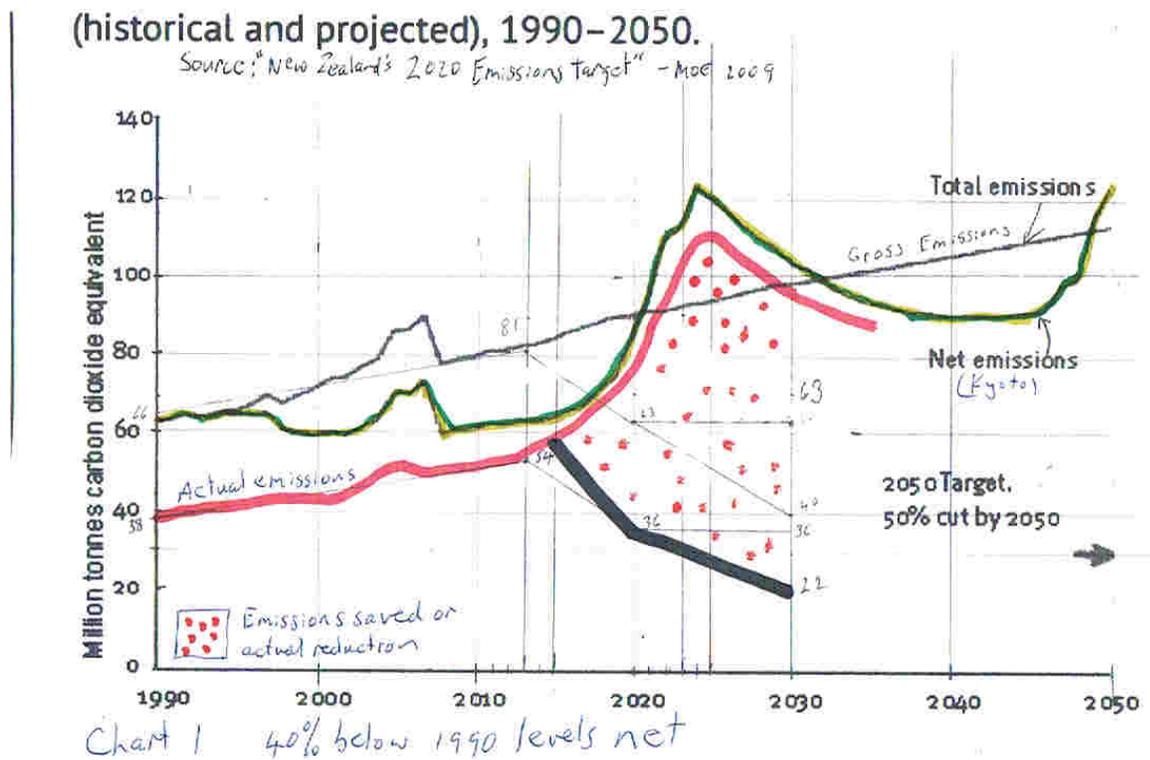
New Zealand is in a trap over this scenario. If we use the gross emissions figure, (like the UK) we can avoid dealing with the emissions overshoot from the harvesting of Kyoto forests, which will peak right in the middle of our commitment period about 2025. Although the figure will be better in 2030 because of new plantings, we will have emitted a huge amount in those 15 years, rather than reducing in a responsible way our cumulative emissions.

Secondly, by not counting land use, land use change and forestry (LULUCF) we are foregoing a major method of emissions reduction, namely a big increase in afforestation. Conversely, if we use net figures to calculate our 40% reduction, we have to count Kyoto harvest but can benefit from afforestation.

In addition, the extra Kyoto credits left over from the first period when carbon was being sequestered were intended to compensate us for when the trees are harvested. We do not have enough credits to do this because our gross/total emissions rose, therefore we left the Kyoto agreement. Therefore we now should not be able to use these credits at all because we have withdrawn from the Kyoto scheme.

Using net emission figures would be more transparent in revealing how much our emissions actually were on a year by year basis. They would also depict our Kyoto forests as a "stranded asset" which we cannot exploit if we are to cut emissions by anything like what is needed for our fair share in keeping global warming below 2°.

Scenario 1 is illustrated in chart 1., adapted from the Ministry of Environment 2009 publication "New Zealand's 2020 emissions target" The grey line labelled 'total emissions' rises steadily like the world emissions by 1 to 2% per year; the prediction made in 2009 has more or less eventuated. The green line, labelled net emissions, represents Kyoto forests only which is why it starts at 66.7 Mtn in 1990, the same as the total figure. As the trees grew they sequestered carbon until they reached their maximum in 2012. The red line represents



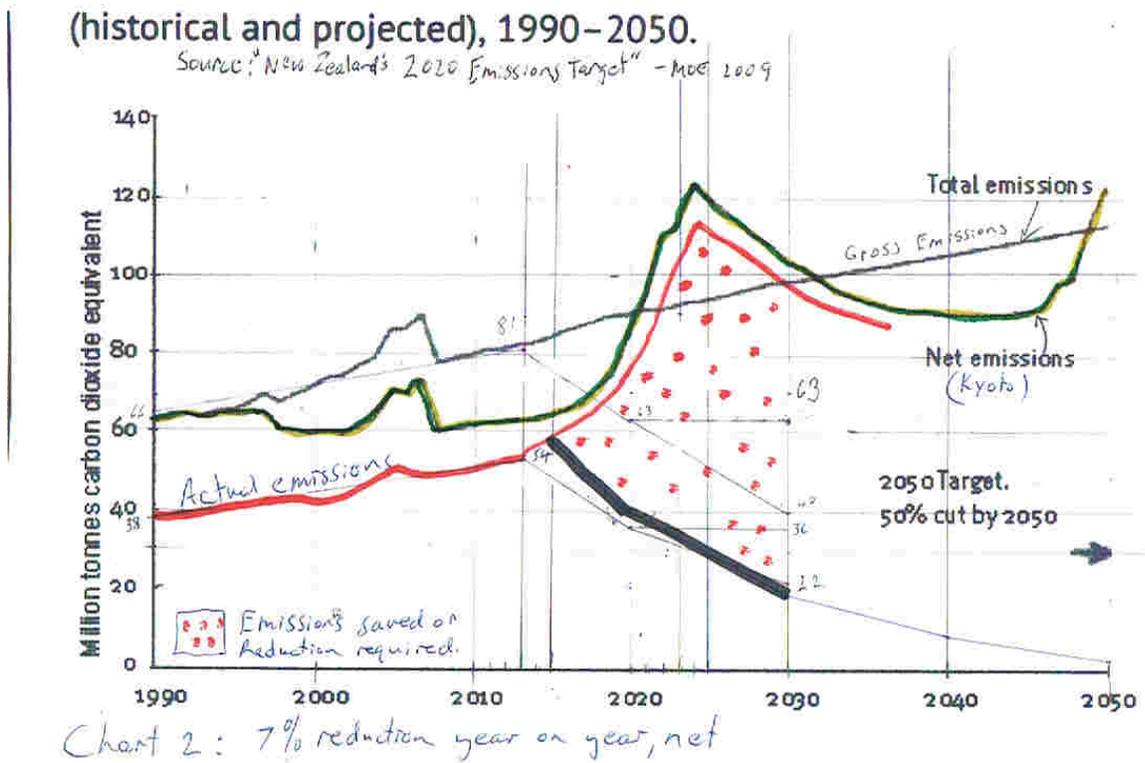
actual emissions starting at 38 GMT in 1990. Therefore the area between the green net emissions line and the red line represents sequestration from pre-1990 forests which reduces over time as they are harvested until nearly all our forests are post-1990. Because the harvesting of pre-1990 forests is staggered there is not the wild cyclical swing of the Kyoto forests. Therefore our net emissions, what we actually emit, the red line, would rise and fall up to 2050 a little below the Kyoto net line, green line. This enables us to estimate the cumulative emissions saved, (the area between the actual (red line) and the black target line for the 40% cut by 2030.

SCENARIO 2 (the almost impossible)

It is often said that New Zealand is unimportant in the world's emission figures because we are so small, contributing only 1.5% of global emissions. However, our per capita annual emissions are 17 tn per person, three times the global average of five, so we should do more than other countries

A tool we can use to even this up is the *carbon budget* of which there are two most frequently cited.

A) The Bill McKibben budget, from his 2012 *Rolling Stone* essay, which states that the world can emit



another 565 gigatons of CO₂ between 2012 and 2050 if we want to stay below 2° C. This gives us an 80% chance of doing so

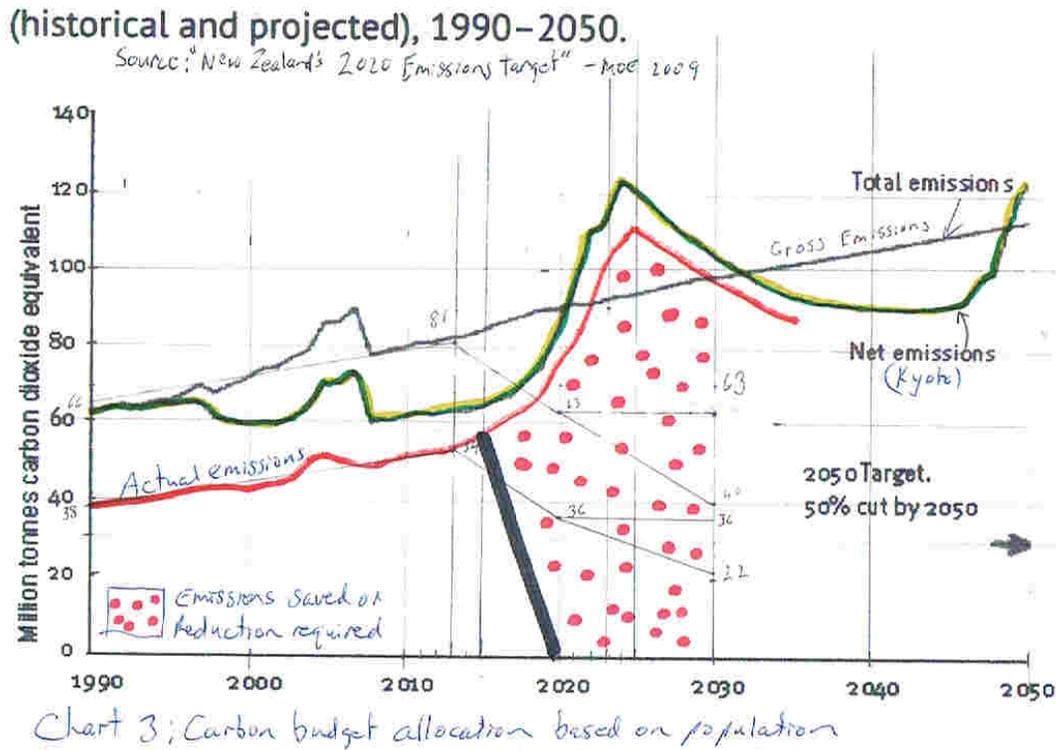
B) The IPCC budget of 990 gigatons, which gives us only a 66% chance of meeting the 2° C limit. (See note C for a discussion of which of these is more accurate).

For the world to stay within the 565 gigatons of CO₂ budget would require a 7% reduction in global emissions year on year from 2012 until 2050. This implies starting from 2013 and counting the historic emissions for 2013 2014 and 2015 before starting the reduction next year (2016). What would it mean for New Zealand to emulate this i.e. to play our part? It would mean reducing from net 58Mtn in 2015 down to 19.5Mtn per annum in 2030 and on down to 5.1 in 2050. i.e a reduction of approx 7% per year.

These reductions are represented in Chart 2 by the black line which is steeper than the 40% below 1990 of scenario 1.

SCENARIO THREE (the really impossible)

Taking the carbon budget again and applying it to New Zealand on a population basis. Our population at 4.5 million is 0.06% of the world's population therefore our fair share could be construed as 0.06% of 565 gigatons giving us 300Mtn to emit between 2013 and 2050. Considering we will have already



emitted 54+56+58Mtn (in 2013 2014 and 2015), this gives us only 132M tn more until 2050. i.e. approx 3 more years of emissions at the current rates. So it is obvious that New Zealand has historically used far more than its fair share and continues to do so. Even a small effort to rectify this would mean a radical change to our economy but would send a huge signal of encouragement to the world. Scenario 3 is represented by the black line on Chart 3

CONCLUSIONS

1. New Zealand and the world are facing a colossal problem which cannot be fixed within the current freemarket - economic growth paradigm.

2. NZ, due to its historical emissions and very high per capita emissions, has virtually no carbon budget left, meaning that to "play our part" we have to make huge and disruptive cuts almost immediately, not just tweaks to the status quo.

3. Emission reduction needs to be achieved through actual cuts to our emissions, not by buying cheap and dubious international credits as offsets, nor by manipulating Kyoto credits from a scheme we no longer belong to.

4. Reductions need to start now, not in 2020, by which time four valuable years will have been lost. If we had started 10 years ago, the problem would not now be so daunting.

5. Setting a target in the form of a certain percentage reduction by a certain year, e.g. 40% below 1990 levels by 2030, is open to manipulation and not conducive to actually reducing emissions. It does not account for emissions along the way, nor does it make the progress towards it being transparent and measurable. Either, progress towards a goal should be along a straight line, or intermediate goals such as 5-year targets should be set. Even better is a carbon budget target such as "emitting no more than 400 Mtn cumulative between 2015 and 2030."

6. While the consultation document emphasises the difficulties we face due to the unique nature of our emissions profile, in actual fact our emissions makeup gives us the potential to be global leaders in emissions reduction and a shining example to the world.

SOLUTIONS

We have three win-win possibilities for NZ

1. Replacing dairy farms with indigenous forest.

A dairy farm emits 6.2 tonnes of CO₂-e per hectare per year

http://www.carbonzero.co.nz/news/documents/dairyNZ_mar09.pdf

and forest sequesters 10 tonnes of CO₂ per year.

[http://www.forestry.gov.uk/pdf/fcin048.pdf/\\$FILE/fcin048.pdf](http://www.forestry.gov.uk/pdf/fcin048.pdf/$FILE/fcin048.pdf)

Therefore, turning 1 hectare of forest into a dairy farm releases 16.2 tonnes of Co₂-e a year, and vice versa. If 10% of our 7million ha of dairy farms were reforested into permanent indigenous forest, that would sequester $16.2 \times 0.7M = 11.34M$ tn CO₂-e or 21% of our 2012 net emissions. This could be achieved through a 'real' incentive, i.e. a carbon tax.

2. Regulating to stop importing non-electric cars into NZ.

We stopped allowing pre-2000 cars to be imported because they did not meet emission standards for health reasons. This gives us a precedent to stop importing petrol cars because their emissions are destroying the atmosphere by overloading it with CO₂. The win-win here is that we would also not have

to import the petrol to run them. All our cars would then be progressively converted to electric by New Zealanders. This would be necessary because it would be too expensive and take too long to replace the current fleet with electric vehicles. This regulation would balance out financially for the country as the cut in dairy exports from 1 above would more than be made up by the savings from importing cars and petrol.

3. We have plenty of potential for 100% of our electricity to be renewable. People would do it themselves if the barriers were removed: a) pay a decent feed-in tariff for home generation, b) make the first 2000Kw free for every home to encourage efficiency, c) reform the electricity sector so that its aim was not to sell as much electricity as possible, but to encourage households and business to use less electricity.

Notes

There are 3 aspects often raised in discussing greenhouse gas emissions

a) Using different units of measure, CO₂ and CO₂-e (the latter including methane, nitrous oxide and other gases). As over half of New Zealand emissions are methane and nitrous oxide it is essential to use CO₂-e when calculating our emissions. For other countries (e.g. UK) CO₂ makes up 90% of their emissions therefore it is logical to use CO₂ as a measure for them. So although there is a slight difference in the units, when comparing the UK and New Zealand the two units are more or less equivalent for the two countries.

b) The calculation of the GWP (global warming potential) of methane and nitrous oxide. Both of these have recently been revised, which is why New Zealand's agricultural emissions have moved from 48% of our total up to 54%. In addition, the GWP is calculated over 100 years, however, the next 20 years are going to be the critical ones for beating global warming. Therefore there is some justification for using a 20 year GWP for methane which is 86 times CO₂. This would lift the agriculture percentage of our New Zealand total emissions even higher.

c) Which of the two carbon budgets quoted is more accurate? The McKibben one or the IPCC? I am going with the McKibben budget because the IPCC one gives us only a 66% chance of staying below 2° C and this is not enough when you're talking about serious climate disruption. Secondly, the IPCC assumes that carbon capture technology will be available after 2020 and there is no evidence that this technology will be up to scale by then.