

Submission on *The Low-Emissions Economy*

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Introduction.

This submission covers seven topics, listed below, raised in the draft document. It looks mainly at the overview, because, as my ideas differ quite radically from many conventional approaches, much of the modelling, especially from Vivid, which is the only one I've read, seems to fall short of what is required. The problem with this modelling is that it has been left high and dry by the new coalition government and its zero by 2050 target. I would like to think that my approach is a striking new way to look at New Zealand's place in the world and how we have a clear way forward to leading the world to a zero-carbon society

1. The adequacy of the net zero by 2050 target and a science-based approach to target setting.
2. How to include Agriculture emissions 100% in the ETS.
3. The 'two-basket' approach to methane.
4. The process of planting one billion trees.
5. How to account fairly for the emissions of the five economic sectors.
6. Setting the value of a unit under the ETS.
7. New Zealand's very poor emission reduction record.

My background

Since retiring in 2011 as a secondary school English teacher, I have read and thought widely about climate change and in particular, how New Zealand can play its part in world emissions reductions. I left the Green Party in 2016 to form the Climate First Party (www.climatefirstnz.org). I stood as a candidate in Auckland Central in the last election for Climate First, on a strong climate-change platform.

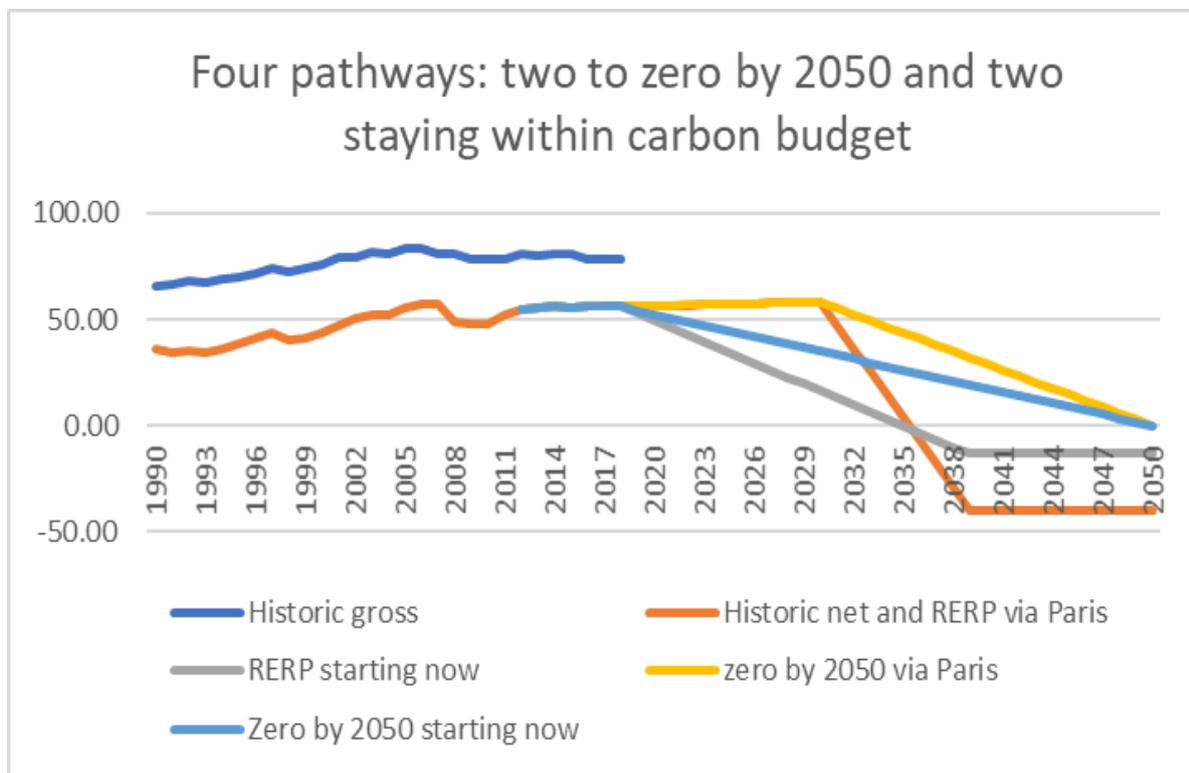
Topic 1. Net-zero by 2050.

When Paula Bennett set up the TOR, she talked about a "**lower-emissions**" economy. To its credit the Commission only referred to a "**low-emissions**" economy, essentially subverting the National Governments aim to merely appear to be doing something about climate change, and replacing it with a realization, expressed strongly again in the draft, that what was required was a quite radical transition to a new sort of economy, not merely a tweak of the old. "The shift from the old economy to a new low-emissions economy will be profound and widespread. The Commission finds nothing to alter that view." (P1.)

I know that the TOR states that we are not to focus on the adequacy of any target, rather the feasibility of reaching the targets already suggested. However, I question the degree to which the target net zero by 2050 is informed by science, as you state (P.5) that all targets should be. This target is nothing more than a nice round figure, which sounds doable because it is 32 years away.

Science (the IPCC) has told us (P.24 of the draft) that the world has a carbon dioxide budget of 1000Gtn of further emissions to have a 66% chance of staying under 2 degrees warming. A straight-line reduction from now down to zero by about 2050 would see the world as a whole stay within this budget. But this will not do for NZ because we are emitting twice the world per person average. To my mind, the only scientific way to calculate NZ's budget is to calculate our share of 1000 Gtns on a population basis. At 0.066% of the world's population we would thus be allowed 660 Mtns. Unfortunately, in the six years between 2012 and 2017 we have emitted 330 Mtns, net, leaving us only another 330 Mtns for the remaining 32 years until 2050. The chart below shows that to truly do our share, we would have to reduce to net zero by 2035 and on down to negative 13 Mtns by 2038, then stay at that through to 2050, so that our negative emissions peg back our overshoot between 2024 and 2035. We'd then come in bang on budget. I call my planned reduction pathway the **"Required Emissions Reduction Pathway"** or RERP and it becomes the fundamental piece on which all my proposals are based, as further explained below. All values are based on the gross and net figures from the New Zealand Greenhouse Gas Inventory and therefore the net figures are different from the Kyoto net ones NZ uses in all its targets.

Chart 1.



The table below is the data for the graph. Columns 2 and 3 (dark blue and orange) represent the pathway which would have NZ staying within its carbon budget by 2050. Obviously if we leave reductions until after Paris 2030, our pathway is impossibly steep. The conclusion must be that we need to immediately change our Paris commitment so that it aligns with those of Australia, Canada and the USA (before it withdrew), i.e. 26-30% below 2005 **NET**.

Column 4 and 5 are the pathways in a straight line to zero by 2050. A look at the total cumulative emissions at the bottom of these columns shows that New Zealand will emit 2.5 times its carbon budget, reducing after Paris, and 1.9 times if we begin linear reductions now.

Four pathways to reduction

	gross historic	rerp net with Paris trajectory	rerp net starting now	net zero by 2050 via Paris	net zero by 2050 starting now
1990	65.81	36.28			
1991	66.74	34.34			
1992	67.94	35.25			
1993	67.47	34.26			
1994	68.64	35.93			
1995	69.52	38.42			
1996	71.62	41.22			
1997	74.37	43.30			
1998	72.03	40.68			
1999	74.06	40.96			
2000	76.10	44.01			
2001	78.82	47.26			
2002	79.37	50.56			
2003	81.75	52.37			
2004	81.30	52.18			
2005	83.28	55.55			
2006	83.33	57.60			
2007	80.98	56.92			
2008	80.88	48.37			
2009	78.26	47.83			
2010	78.67	47.60			
2011	78.52	51.85			
2012	80.85	55.03	55.03	55.03	55.03
2013	80.15	55.29	55.29	55.29	55.29
2014	80.88	56.00	56.00	56.00	56.00
2015	80.70	55.84	55.84	55.84	55.84
2016	78.73	55.95	55.95	55.95	55.95
2017	78.73	55.95	55.95	55.95	55.95
2018	78.73	55.95	55.95	55.95	55.95
2019		56.15	52.65	56.45	54.20
2020		56.34	49.35	56.62	52.46
2021		56.54	46.05	56.79	50.71
2022		56.74	42.75	56.95	48.96
2023		56.93	39.45	57.12	47.21
2024		57.13	36.15	57.28	45.46
2025		57.32	32.85	57.45	43.71
2026		57.52	29.55	57.62	41.97
2027		57.72	26.25	57.78	40.22
2028		57.91	22.95	57.95	38.47
2029		58.11	19.65	58.12	36.72
2030		58.3	16.35	58.28	34.97
2031		47.38	13.05	55.37	33.22
2032		36.46	9.75	52.45	31.48

2033	25.54	6.45	49.538	29.73
2034	14.62	3.15	46.62	27.98
2035	3.70	-0.15	43.71	26.23
2036	-7.22	-3.45	40.80	24.48
2037	-18.14	-6.75	37.88	22.73
2038	-29.06	-10.05	34.97	20.99
2039	-40	-13.35	32.05	19.24
2040	-40	-13.35	29.14	17.49
2041	-40	-13.35	26.23	15.74
2042	-40	-13.35	23.31	13.99
2043	-40	-13.35	20.40	12.24
2044	-40	-13.35	17.48	10.49
2045	-40	-13.35	14.57	8.75
2046	-40	-13.35	11.66	7.00
2047	-40	-13.35	8.74	5.25
2048	-40	-13.35	5.83	3.50
2049	-40	-13.35	2.91	1.75
2050	-40	-13.35	0.00	0.00
total emitted	670.01	655.93	1632.10	1257.37
	near budget	near budget	2.5x	1.9x

The idea of negative emissions only occurred to me when I read Uruguay’s INDC, which intends to reach negative emissions by 2030. This idea illustrates the power of an example. Therefore, I really like your statement on page 5: “NZ can only influence others if it has a clear target, based on science, plus a system of successive emission budgets.”

Another important issue for NZ is that the IPCC carbon budget is only for CO2, which does not make up most of NZ’s emissions. For the purpose of comparison, I have calculated NZ’s emissions in Co2e compared with the world carbon budget which is in CO2. My justifications for doing this are discussed in topic three below, “The two-basket approach.”

Topic 2. How to include agriculture emissions 100% in the ETS immediately.

My discussion in topic one provides a solution to NZ’s most intractable climate-change problem, how to include agriculture 100% in the ETS. I propose that once a target has been scientifically chosen, a straight line be drawn to it from the current emission level. This line becomes our pathway with annual waymarks. I call it the Required Emission Reduction Pathway (or RERP).

Thus, on an annual basis, any business/farm which was above the RERP would pay a carbon penalty. Conversely, a business/farm with emissions below the RERP would receive a payment or credits. To give an example: a dairy farm would be 100% included in the ETS in year 1 but pay nothing because it would be exactly on the line (RERP). In year 2, it would pay a small carbon penalty for its emissions above the slowly falling RERP. My paper, [“The Afforested Dairy Farm meets the RERP”](#) (Climatefirstnz.org) works through this for the years 2019 to 2050 for the average dairy farm of 146 ha and 419 cows. It finds that if the farmer planted 10 ha of cypresses in year 1, a further 10 ha in year 8 and a final 10 ha in year 16, the farm would track the RERP down and neither pay or nor receive carbon units. As well the result would be that the farm makes only a slightly smaller profit to

normal and has made its full contribution to New Zealand's emission reduction effort. The figures used are from the 2015 Inventory. The numbers have changed slightly, using the 2016 Inventory, but the essence of the proposal remains the same and still viable.

For my model I chose a carbon price of \$100 a tonne of CO₂ which would remain stable forever. People might balk at planting good dairy land in trees, but they could be planted along waterways to improve runoff-water quality. This planting would also reduce the land available for grazing, thus both reducing emissions and increasing sequestration.

Topic 3: The two-basket approach to Methane.

I am against your recommendation that NZ adopt this approach for accounting for methane emissions. Firstly, I am concerned that the methane concentration in the atmosphere has spiked since 2013 after a period of being flat. Scientists are not certain of the cause but if it continues:

- a. The world will not let NZ use this approach because so much of our emissions is methane.
- b. The flow of methane into the atmosphere is obviously accelerating and therefore its danger is increasing, not stabilizing, thus demanding equal treatment with CO₂. While labelled a short-lived gas, methane's effect globally is not short term, with atmospheric concentration growing more than 150% since 1990, whereas CO₂ has only increased 45% over the same period.

Is not there an inconsistency in counting methane's effects over 100 years (GWP100), when the period we are dealing with (2018-2050) is only 32 years. Surely, we should be using GWP32 in counting methane, which means it is 77 times CO₂, not the 28 times which GWP100 represents. Thus, if we are being honest about reaching net zero by 2050, then we can't really count methane's non-warming (because it is virtually non-existent) in the years 2051 to 2118. The repercussions of this inconsistency are enormous, and it could rewrite our greenhouse gas inventory so that Methane accounts for 67% of our emissions and agriculture 74%, not 47% of our emissions. A call to concentrate on CO₂ and de-emphasise methane would look very self-serving.

Topic 4: The planting of 1 billion trees.

Thought needs to be given to the species planted. Indigenous trees sequester CO₂ too slowly to make a difference over the next 30 years. On the other hand, with exotic plantations, the sequestration is only temporary if the trees are harvested, transported and processed and the waste wood which makes up 1/3 of the tree degrades and releases its carbon. My solution is to choose a

GETTING SMALL LANDHOLDERS ON BOARD

Having recently planted 0.5Ha of Cypress/ Blackwood, I found the idea of earning carbon credits attractive, but daunting to investigate. I got the impression that I would have to hire a specialist lawyer to set it up and that the area was too small to be profitable.

What we need is a government 'shop', properly advertised, where a small landowner would feel welcome to explain how big an area they wished to plant and to get advice on species and how many credits or how much cash they could earn. The minimum size could be 0.5 hectares. and the maximum 10 ha. The government shop person would meet the owner on their land pre-planting, and again post-planting to verify the process. From then on, the site

could be monitored by satellite. The owner would have some obligation to prune, and the contract with the government could be registered on the title.

At the point when sequestration begins to fall away (e.g. 40 years for cypress), the forest owner could choose between logging for profit and paying back the credits/cash or storing the logs securely (only with durable species) so their carbon remained locked up on site and replanting, at no carbon expense and no cost of roads, transporting and milling.

The benefits of this scheme would be:

- The landowners would feel that they were contributing to NZ's carbon sequestration.
- Small forestry lots would be less prone to disease and fire, being isolated
- The woodlot could be planted by a stream to slow silt runoff.
- It would smooth the pathway for planting and understanding the process
- A small stand could be managed by 1 or 2 people without employing contractors
- The landowner would be more aware of emissions and thus more likely to drive an EV or install solar panels.
- A national organization of such small foresters would increase the feeling of belonging to a movement, fostering social contacts.
- 9000 small forests of one ha would represent 10% of the required 90,000 ha needing to be planted each year if we are to reach the billion trees target.

durable species such as Cypress and grow it solely for its value as a carbon sequesterer, and not for timber at all. That would mean, after 40 years, cutting it and storing it onsite under a waterproof roof for 100 years and immediately replanting the site, to sequester for another 40 years. At my recommended carbon price of \$100 per tonne, and assuming that Cypress averages, over 40 years, 20 tonnes CO₂ per hectare of sequestration, that would yield \$2,000 per hectare or \$60,000 per year for 30 hectares. This would be a goldmine for a sheep farmer, and significant for a dairy farm.

Topic 5. Accounting for emissions within the economy

If the world economy is to act together to reduce emissions to zero, then the fundamental concept has to be that of **fairness**. If people feel that the burden is not fairly shared, then they will not make the sacrifices required. This applies on a global scale with every human having an equal right to emit the same amount, but it also applies within the national economy. Therefore, in making a living on a farm, a farmer and his wife plus a sharemilker and her husband, on the average fairy farm of 146 ha and 419 cows, should not be allowed to emit 1,500 tonnes of ghg, when four city dwellers make a living emitting only say 50 tonnes of Co₂e. Its not fair and as consequence city dwellers will not make an effort to lower their carbon footprints. This situation will deteriorate further if farmers only have to pay 5% of the carbon charge which citydwellers have to pay in full. **My proposal is that all sectors of the economy reduce their emissions in proportion to how much they emit.** Therefore agriculture, which is responsible for 47% of our emissions must make 47% of the cuts.

This is where my RERP comes in. Once the Required Emissions Reduction pathway is set, then each industry merely must stay on it to avoid paying any carbon charge. This system is hugely transparent, gives certainty to businesses and households because the carbon price is set at \$100 per tonne, immediately and forever.

The argument is always made that farms are trade-exposed, and that New Zealand is a trading nation; all countries are trading nations, and this argument never seems to be advanced about manufacturers in other countries being exempted because they must pay a carbon charge on their energy use. If the world is to reach zero net emissions, then emissions-intensive industries will have to be phased out. As an illustration, if we reduced dairy exports value say by 10%, by exporting less milk and at the same time reduced car and petrol imports by the same value, it would be a huge win-win for the climate but would not affect our trade balance at all.

An associated issue under this topic is “carbon leakage,” the danger that if New Zealand moves on Climate Change ahead of its trading partners, agriculture will shift from efficient, low-emissions-intensive NZ to more emissions-intensive production overseas, and thus increase global emissions. To me this is a red-herring perpetuated by farmers. I believe that if we achieve radical emissions reductions in New Zealand, then the effect of our example will far outweigh any effect due to “carbon leakage.”

Topic 6. Setting a price on carbon

Clearly even though the draft states that the price should be the same right across the economy, it immediately undermines this by allowing farmers to only pay 5% of what they owe. This is an example of political interference in the price-setting process; it is a contradiction. Let's face it, the reason farmers will have to pay so much carbon charge, is that they emit so much ghg. Moreover, the carbon charge would not be a farmer's biggest expense, their land is, because of inflated prices for dairy farms. These high prices are caused by the high recent profitability of dairy farms. If they weren't so profitable, farm land would be cheaper to buy; a new equilibrium would settle in.

Another problem is that setting a carbon price which hardly affects a motorist (\$100 per tonne will cost the average motorist only \$250 per year), will cost a dairy farm \$150,000. My conclusion is that it is impossible to set one price which is fair across the economy under the current ETS, but it is feasible using my RERP. Further, when it comes to setting and raising the price as suggested up to \$150 per tonne or even \$200, there is again scope for political influence. But there is also room for this interference when regulations other than a carbon price are introduced, such as differential registration prices according to engine size or efficiency, or spending on public transport, or urban planning to benefit rail, not cars.

Inherent in going with the ETS, there seems to be a love of markets and trading. With my fixed and never-changing carbon price of \$100 from day one, units can still be traded, only their price is fixed and known and certain. So, for all sectors of the economy, pressure and incentive to reduce emissions would come from the requirement to stay on the RERP to avoid carbon charges.

Topic 7. New Zealand's very poor climate change record.

In explaining our awful record of rising emissions from 1990 to 2015, compared to other OECD countries, the finger is usually pointed at motor transport and agriculture. There is, however, a third cause and that is our very weak targets and non-existent policies for reaching them.

Firstly, there was our dishonest method of calculating net emissions, using the gross-net comparison, introduced for the first Kyoto period, used again for the 2020 target and now perpetuated with our Paris commitment for 2030. This accounting method is almost impossible for

the average person to understand and is a huge impediment to the public getting on board with making emission reductions. It has also made our targets easier, meaning that we could reach them and still have rising emissions.

Secondly, there is the ETS, which has completely failed to prevent forests being cut down and converted to dairy farms because, a) the unit price has been ridiculously low and b) forest harvesters have been able to buy overseas units even cheaper, before they were declared fraudulent, then surrender them when they deforested. "NZ was the top buyer from (the global market) as a proportion of its domestic emissions" P.35.

Thirdly, now a third evasion is being contemplated, treating methane (which we produce a lot of) as being less urgent to reduce compared to CO2.

Fourthly, we have rested on our renewable electricity-generating laurels. Our fortunate situation with 85% renewables was created by visionary governments, who built many dams, well before 1990. Very little further progress has been made since.

In order to restore New Zealand's lost credibility on the world stage we should firstly move from using Kyoto accounting to using the net figures from the inventory, as other countries do. That way our net emissions actually represent what the atmosphere sees from us, not some artificially created figures which the public, whom we are asking to make sacrifices, can't understand. The same obscurity applies to the ETS, which is a mystery to most people. I would prefer a carbon tax, universally applied, even though the transition to it would be challenging. If we are asking the public to make the effort to reduce our national emissions, we owe them a simple, system which they can trust.

As well, our Paris target must be reworked in transparent terms; and methane must be treated with the respect it deserves, by calculating its GWP over the same term as we are trying to reduce to net zero, i.e. GWP32.

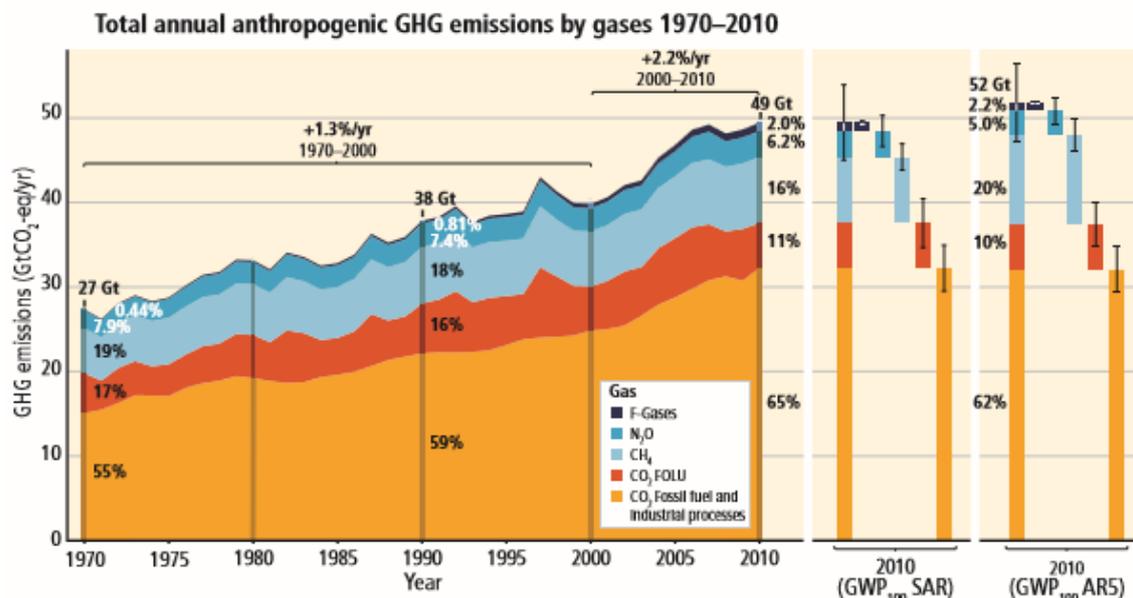
By these means NZ will be able to set a target which the public can make sense of and therefore, see the reasons for achieving.

I wish to make some further comments about some smaller items in the draft report.

1. The TOR repeats, on the first two pages, the expression "growing income and wellbeing" 5 times and mentions growing the economy only twice. A look at New Zealand's emissions since 1990 shows that the largest fall happened during the Global Financial Crisis, when economic growth slowed radically. The draft acknowledges on P.33 that both economic growth and population growth contribute strongly to emissions growth. It is pleasing then that the word *wellbeing* occurs so frequently. I would like to see the Commission acknowledge that measuring wellbeing in terms other than GDP and its growth would lower consumption and thus lower emissions. A recommendation that NZ aim for lower population growth, especially through reducing immigration, would also help to lower emissions.
2. In the overview, a list of the adverse effects of climate change is given. To my mind the most real danger is omitted – that of our country being invaded by climate-change refugees. This issue has already had a huge effect politically in Europe, and the USA, contributing to Brexit and the populist victory of Donald trump. It has also seen the rise of far-right, xenophobic parties and movements in Greece, Italy, France, The Netherlands and Poland. New Zealand, being an empty temperate country, with plenty of water, would be the perfect destination for millions of

refugees displaced by climate change. The world desperately needs empty countries full of trees, and in my opinion New Zealand needs to stay that way.

- The following chart from IPCC Fifth Assessment report is very scary and I believe shows that it will be extremely difficult for the world to reduce to zero net emissions in time. This is because since 1990, human-influenced forests, the orange band in the chart, have been a source of emissions, not a sink as with New Zealand. Thus NZ, despite protestations by the last government that no one knew of a way to reduce Agriculture emissions, has the potential (because of our large sink) to reduce emissions to zero or below, whereas the world doesn't. All we would have to do is reduce our gross emissions to say 30 Mtns and have a forest sink of 30 Mtns, which we have often had before. NZ also has one of the most democratic and least corrupt political systems in the world, with the good chance that if the people wanted to, they could decide to and implement a huge reduction in emissions. Factors acting against this in New Zealand though, are high inequality, homelessness and child poverty, all phenomena which mean people must worry about surviving in the short term and thus have no time or energy to think about the future or act in unselfish ways.



Source; IPCC Fifth Assessment Synthesis Report, Summary for policy makers, p.5

- Emissions from motor cars are clearly the main problem, yet the same old solutions are trotted out: EVs, fuel efficiency, public transport and cycling. There is very little written in the first part of the draft about urban design as the leading driver, so to speak, of car culture. As I drive out of Auckland I am appalled at the new urban sprawl along the new motorways built by the previous National government. The Christchurch rebuild is another example. There was a wonderful opportunity to build a city for the future, but it was missed, and a carbon-dependent sprawl is the result under National.

I know some of this urban expansion is caused by immigration, but the prevailing view seems to be that new houses anywhere are a sign of growth, employ lots of builders and are therefore a good thing. To me the greatest irony is the call to bring in even more builders because we don't have enough to build the required houses. Don't people realise that these immigrants will have to start by building a house for themselves to live in! Some suggestions are: training our own citizens as tradespeople, making streets in new subdivisions narrower; there is no need to provide on-street parking when sections have plenty of off-street parking. We don't need trees

and wide berms in streets either; people have trees and lawn on their own sections. If streets take up 24% of urban space, making streets half the normal width would enable a city to be 12% more compact.

Thank goodness this government is serious about electric rail which is emissions free. All we need now is intensification round the rail corridors and more rail corridors.

Conclusion

1. Net zero by 2050 is not a strong enough target if NZ is to be a model country for the world.
2. Methane, although labelled a short-lived gas is further accumulating in the atmosphere, so needs addressing, especially by NZ which produces so much of it.
3. A fixed linear reduction path (my RERP), coupled with a carbon price permanently fixed at \$100 is the best, most transparent way of providing the certainty that businesses and households need if they are to adjust to the challenges of carbon reduction.
4. New Zealand with its large and potentially huge forest sink is in a perfect position to lead the world on carbon reduction. But the world as a whole, whose forests are a carbon source, is poorly placed to reduce enough and in time to stop 2 degrees of warming.
5. New Zealand has a shocking history of increasing emissions, caused by hopelessly weak and fudged targets in the past, and this is being perpetuated with Paris.
6. We need urgently to strengthen our Paris commitment to bring it in line with Australia, Canada, the USA and the EU, countries whose level of development we share.
7. NZ will need to achieve negative emissions before 2050