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The New Zealand Productivity Commission  
PO Box 8036, The Terrace, Wellington 6143

**Submission to The New Zealand Productivity Commission  
on the Low-emissions economy Draft Report**

I welcome the commission's effort on creating an excellent draft report. I have a number of comments which I submit for consideration.

**1. The impact of setting a target of zero emissions by 2050 on policy approach.**

New Zealanders have voted now to achieve a zero emissions economy by 2050. This has a significant impact on the particular approaches justified. Any ETS pricing regime approaches the matter with a view that a certain level of emissions is "allowable", and that they should migrate to those activities that give us the higher net productivity. However, getting to zero really means a greater emphasis on actually setting in place regulations to outlaw CO2 pollution in the same way we outlaw littering and other forms of pollution. In this regard setting a higher price on carbon is commendable, however it needs to be supplemented with actual regulation indicating a final date for emissions from some of our most polluting industries and companies. For example Fonterra should be given a final date for burning coal since they have alternatives. NZ Steel must re-instate steel recycling, and investigate alternative technologies utilising less carbon. An end date should be set for private fossil fuel motor vehicles on NZ Roads.

**2. The price of carbon needs to be significantly higher**

The price of Carbon needs to be high enough to incentivise people to take it out of the atmosphere, and high enough to remove the CO2 earlier rather than later.

The pricing for CO2 emissions needs to be set up at the multi-hundred US\$ mark, to actually encourage people to give up land for trees and implement technology to actually take CO2 out of the atmosphere.

For Example a Swiss company is extracting and concentrating CO2 out of the atmosphere at US\$600 per tonne

<https://www.nature.com/news/commercial-boost-for-firms-that-suck-carbon-from-air-1.18551>

For example: Bill Gates has invested in a scheme to convert CO<sub>2</sub> from the atmosphere directly to fuel. At US\$600 to US\$1000 per tonne.

<https://www.globalcitizen.org/en/content/bill-gates-carbon-emission-engineering-co2/>

### 3. Population and Emissions

The report does not appear to address the risks of population increase, both natural and through immigration, nor the impact on New Zealand's emissions and our ability to achieve our targets.

Emissions are commonly expressed in a mathematical form through the Kaya Identity, which is a specific Emissions form of the I=PAT equation, expressing Human Impact on the environment as an equation. This extract from **The IPCC Special Report on Emissions Scenarios** describes driving forces of emissions.

#### 3.1. Introduction

Some of the major driving forces of past and future anthropogenic greenhouse gas (GHG) emissions, which include demographics, economics, resources, technology, and (non-climate) policies, are reviewed in this chapter. Economic, social, and technical systems and their interactions are highly complex and only a limited overview is provided in this chapter. The discussion of major scenario driving forces herein is structured by considering the links from demography and the economy to resource use and emissions. A frequently used approach to organize discussion of the drivers of emissions is through the so-called IPAT identity, equation (3.1).

*Impact = Population × Affluence × Technology* (3.1)

The IPAT identity states that environmental impacts (e.g., emissions) are the product of the level of population times affluence (income per capita, i.e. gross domestic product (GDP) divided by population) times the level of technology deployed (emissions per unit of income). The IPAT identity has been widely discussed in analyses of energy-related carbon dioxide (CO<sub>2</sub>) emissions (e.g., Ogawa, 1991; Parikh *et al.*, 1991; Nakicenovic *et al.*, 1993; Parikh, 1994; Alcamo *et al.*, 1995; Gaffin and O'Neill, 1997; Gørrer and Ban, 1997; O'Neill *et al.*, 2000), in which it is often referred to as the Kaya identity (Kaya, 1990), equation (3.2).

*CO<sub>2</sub> Emissions = Population × (GDP/Population) × (Energy/GDP) × (CO<sub>2</sub>/Energy)* (3.2)

All these equations show Population as a critical factor requiring consideration.

As it is not excluded from the Productivity Commission's terms of reference, the Draft Report as it stands appears deficient in not discussing population, population trends, and how to limit population growth in new Zealand as part of the solution to reducing emissions.

The government needs to take a leadership role in ensuring we do take measures to get to zero or negative population growth in New Zealand. Recent studies show this can be achieved mostly through ensuring that girls achieve their full academic potential, and have a large number of opportunities to generate their own income rather than fall by default into the role of "motherhood".

In addition the role of religion in forcing women down certain pathways in life should be addressed. Any religious influences which direct women into motherhood or restrict their access to contraception, or restrict their opportunities indirectly through clothing, attire must be discouraged.

The discussion around population has progressed for a number of years to the point where the link between opportunity for girls and a stable population is well acknowledged. Here is the link to the United Nations State of World population report:

[https://www.unfpa.org/sites/default/files/sowp/downloads/The\\_State\\_of\\_World\\_Population\\_2016\\_-\\_English.pdf](https://www.unfpa.org/sites/default/files/sowp/downloads/The_State_of_World_Population_2016_-_English.pdf)

Could the productivity commission please add a section relating to population in its report.

#### 4. Barriers to the uptake of EVs

Your report has missed some of the barriers to the uptake of Electric Vehicles, which are mentioned quite often in the Facebook NZ EV Owners Group.

a. Kiwi's who do not own their own home, can not purchase an EV as there is often not even a 10 Amp plug point in rental accommodation carports for example. People in apartments may have no power point in the communal underground garage spaces. The government should consider legislating 20 amp caravan power points in all apartment car park spaces and the retrofitting of 10 Amp sockets in carports of rental accommodation to allow the socio-economically disadvantaged to take up EVs.

b. Employers generally do not provide EV charging at work. The catchment area of commuters able to use cheaper EVs to travel to work would be 4 times, (2 times radius) if employers provided charging at work. Studies in the USA, indicate enormous increases in the uptake of EV's where employers provide charging at work. The *US Department of Energy Workplace Charging Challenge* measures EV ownership/uptake at 6x the rate of usual uptake where employers have made EV charging available at work. See the report below.

[https://www.afdc.energy.gov/uploads/publication/wpc\\_2016\\_progress\\_report.pdf](https://www.afdc.energy.gov/uploads/publication/wpc_2016_progress_report.pdf)

Charging at work is preferable for New Zealand as daytime charging can use solar power rather risking owners plugging in when they arrive home therefore hitting the peak 6 to 9 pm period of peak power demand.

## 5. The Electricity Sector

The report misses a few points relating to Hydro electricity and the intertwined relationship between Electric Vehicles and the daily demand pattern.

- a. Hydro will become more reliable with a projected increased mean rainfall, in the south and in winter.

The commission's draft report indicates the need to have backup non-renewable supply to cover for dry years which reduce the availability of hydro generation. However the NIWA climate information resources show an increase in mean rainfall in The South and Otago as climate change takes effect. Therefore retaining fossil fuel generation is less of an issue than your draft report makes out.

<https://www.niwa.co.nz/our-science/climate/information-and-resources/clivar/scenarios#regional>

- b. Legislation should be used to level daily demand under a high EV ownership scenario. [The relationship between EV's and demand levelling has been missed in the report]
  - Employers should be legislated to provide daytime charging for employees, at a nominal rate for employees.
  - Incentives should be available for manufactures or Kiwi industry to have EVs push energy into the grid from 6pm to 9pm at an owner's discretion.
  - The net battery storage content of the nations EV fleet will easily be the largest short term electricity storage available. NZ Research institutions should be assigned to take advantage of this fact.
- c. Concept Consulting argues further solar power generation should be discouraged. This does not take into account six factors.
  - i) As we have global warming the peak daytime demand for air-conditioning will increase, making solar sensible. Under a 2 degree or higher rise in global temperatures Aucklanders may have summer air-conditioning as the norm. An increase in global temperature will see offices draw more power to maintain existing indoor temperatures.
  - ii) If EV's are charged in the middle of the day, again solar becomes sensible.
  - iii) The fact that **demand can be moved to match an increase in Solar supply** is a **significant flaw** in the Concept Consulting view on solar energy.
  - iv) Time of day pricing would move household electricity demand into midday hours with Solar power driving down midday pricing
  - v) Rooftop Solar generates power at the point of use, minimising the need to increase transmission infrastructure to cater for increasing demand. This is not true of any other form of electricity generation.
  - vi) Rooftop solar is a very good way of getting the New Zealand public on board with renewable energy, in terms of opportunities to get involved

and do it yourself. Rooftop solar as a communication strategy for helping the environment should not be discounted. It is an every day visible reminder of the need to save the planet.

## 6. Flaws in the concept of Emissions trading.

The report takes a general view it seems that one dollar of income or a dollar of consumption generating a certain quantity waste CO<sub>2</sub> or GHG emissions are of equal value to society. Clearly this is not true. If a wealthy individual can afford to travel a kilometre in their lamborghini for example , and is willing to pay the emissions price, that is clearly not of the same value to society as a socio economically disadvantaged person cooking a winter meal.

In addition the wealthy person had alternatives, whereas the other person did not.

This is the general issue with an emissions trading system. It treats generation of waste (CO<sub>2</sub>) as a resource. It is not actually a resource of constrained availability such as, it is simply litter . If we can sustain a particular amount of litter on our street, we don't ascribe a price and allow rich people to litter more, we simply have a law against littering.

An emissions trading scheme not supplemented by additional regulation has the following issues:

- a. It falsely assumes productivity ought measured in GDP dollars per person, whereas ultimately happiness in society is non linear in relation to dollar consumption. This is evident if you compare for example, a dollar consumed driving a lamborghini does not generate for the wealthy individual more happiness than a dollar hashbrown for a hungry child.
- b. The idea that a wealthy person should not be able to litter more, breathe more, drink more water, than a poor person is generally accepted, so why should a rich person be able to emit more CO<sub>2</sub> or be allowed to create more environmental damage than a poor person. As you can see the fundamental assumptions under emissions trading are on shaky ground from a moral point of view.
- c. At the prices carbon emissions will rise to, there could be hardship for individuals at the bottom end of society, whereas the wealthy will always be able to continue to behave in a CO<sub>2</sub> profligate manner. This means the wealthy never get involved, and often it is the wealthy that drive the government, society through advertising, and workplace culture.
- d. It does not take into account that the wealthy put the CO<sub>2</sub> into the atmosphere in the first place, and really should pay a higher amount to take it out. It is for example, unjust and inequitable that a poor person on a benefit, who has never been on an overseas flight, would pay an increased electricity price to take CO<sub>2</sub> out of the atmosphere that the rich put there.
- e. Emissions trading can be cheated on by simply mis-declaring or not declaring emissions. An example would be farm burnoffs. The emissions trading system has been cheated on in the past even in New Zealand. There is an accepted belief Carbon markets fail for this and other reasons. <https://www.theguardian.com/sustainable-business/blog/why-are-carbon->

[markets-failing](#) I note also the exposure by the Morgan Foundation of some of New Zealand's largest businesses utilising suspect carbon credits. Steps should be taken to ensure emissions trading only occurs within New Zealand.

- f. Fundamentally emissions can not always be measured. A meter can not be added to the back and front of every cow to measure the type, ratio, and quantities of its GHG emissions. And that is the fundamental reason ETS schemes can and will be cheated through misapplied formulae, undeclared emissions, and mis-declared emissions estimates.
- g. An ETS does not take into account the ability of particular groups of individuals to change their emissions behaviour. Changing your gas heating over to electric is clearly much harder for a poor individual, than say a wealthy person buying an electric Tesla rather than a V8 SUV.
- h. Carbon once above ground and in the carbon cycle inevitable returns to CO<sub>2</sub>. Through rotting trees, forest fires etc. Actual regulation to keep the carbon under the ground is essential.

Although I believe the ETS is essential and that the price of carbon should be raised significantly, the ETS scheme needs backing up with strong regulation that forces the wealthy to reduce their carbon footprint, and forces industry and business to lower their carbon footprint by set end dates.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Alan Barraclough', with a long horizontal flourish extending to the right.

Alan Barraclough