

# Implementation of a tax and one hundred per cent dividend scheme as a means for New Zealand to address greenhouse gas emissions

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## Introduction

Climate scientist Dr James Hansen, director of NASA's Goddard Institute for Space Studies<sup>1</sup>, visited New Zealand in May 2011 to address the New Zealand public on climate change. As well as speaking about the scientific basis for the detection and attribution of changes in climate and potential impacts of climate change, Dr Hansen advocated the use of a tax and dividend scheme for reducing CO<sub>2</sub> emissions (Hansen 2011). New Zealand aims to meet its greenhouse gas emissions reduction targets<sup>2</sup> via an emissions trading scheme (ETS). While the ETS has built strong political momentum, there is also value in discussing potential alternatives, such as that advocated by Dr Hansen, to explore whether such a scheme could be applicable in the New Zealand context.

## The Emissions Trading Scheme

It is useful for those new to climate change policy to understand the details of the ETS currently implemented in New Zealand. The fifth Labour government announced the ETS in 2008, after failing to implement an emissions tax package following political and industrial opposition. After the 2008 general election, the National Party formed a new government and put the ETS on hold. Further changes were made to the ETS, and it was passed into law in 2009. Under the ETS, polluters included in the scheme must give the government a carbon credit called a 'New Zealand unit' (NZU) for every tonne of CO<sub>2</sub>-equivalent (CO<sub>2</sub>-e) greenhouse gas emitted<sup>3</sup>. The ETS is neither cap-and-trade, nor a carbon tax (Bertram & Terry 2010). It is not cap-and-trade,

because there is no cap on the number of NZUs that can be issued by the government. It is not a carbon tax because under a standard carbon tax, polluters pay the government per quantity of emissions and the money becomes government revenue, but under the ETS, the money used to purchase NZUs goes to the seller. Carbon-intensive and trade-exposed industries receive free NZUs from the government; the starting rate for intensive industrial emitters is 90% free NZUs, and for moderately intensive emitters it is 60% free NZUs (Bertram & Terry 2010).

One particularly positive outcome of the ETS is that it has slowed the conversion of forests to farmland. Additionally, due to inclusion of the forestry sector (forests can be accounted for as carbon sinks under Kyoto Protocol rules) the ETS will help New Zealand meet its Kyoto Protocol target. As currently structured, the ETS is politically viable. While no research has been done into whether a more severe emissions regime would force New Zealand-based businesses that are carbon-intensive and trade-exposed offshore, one might presume that that would be the case. Hence, the New Zealand government has decided to allocate free NZUs to carbon-intensive and trade-exposed industries with a view to mitigating that. However, unless free allocation of NZUs is reduced, this also limits the effectiveness of the ETS as a tool for reducing greenhouse gas emissions. The ETS is expected to reduce projected gross emissions by 0.7% over CP1 of the Kyoto Protocol (Bertram & Terry 2010) – see Figure 1.

Although the ETS as currently implemented has several shortcomings, the reality of climate change policy is that compromise to achieve political and economic palatability is necessary; thus, given the current political forces, the government has chosen a politically expedient middle road in developing the ETS. Nevertheless, in the interests of fostering public discussion around greenhouse gas emissions mitigation schemes, there is

<sup>1</sup> GISS is located at Columbia University in New York City. The institute is a laboratory in the Earth Sciences Division of NASA's Goddard Space Flight Center and a unit of the Columbia University Earth Institute.

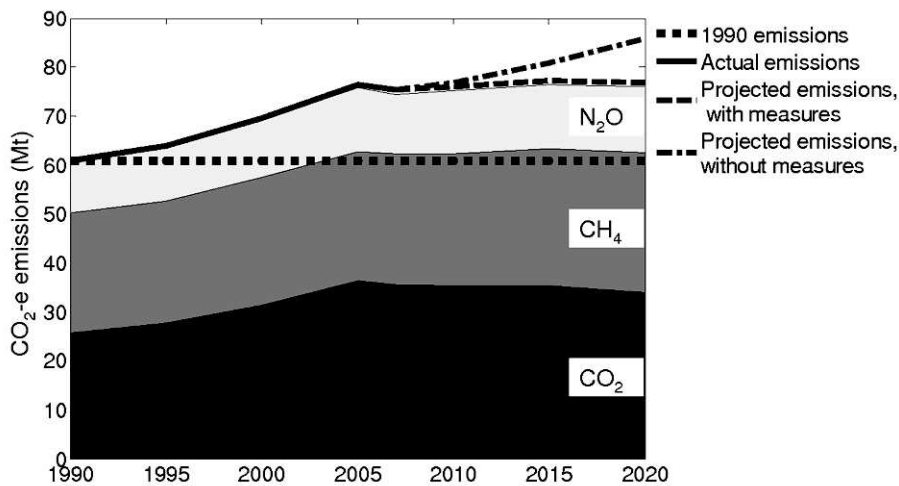
<sup>2</sup> Under the first commitment period (CP1) of the Kyoto Protocol, New Zealand's target is that net emissions over CP1 (2008-2012) must not exceed 1990 gross emissions (Ministry for the Environment, 2010). Beyond CP1, which will soon expire, New Zealand aims to reduce net greenhouse gas emissions to 50% of 1990 levels by 2050 (Ministry for the Environment 2011b).

<sup>3</sup> CO<sub>2</sub>-e is the abbreviation for 'CO<sub>2</sub>-equivalent'. Different greenhouse gases have different absolute global warming potentials (AGWP; the radiative forcing resulting from a 1 kg pulse emission of that gas typically integrated over a 100 year time horizon). The CO<sub>2</sub>-e is the emission mass multiplied by the AGWP for that gas divided by the AGWP for CO<sub>2</sub>.

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**Figure 1. New Zealand's actual and projected greenhouse gas emissions (expressed as CO<sub>2</sub>-equivalent). The 'with measures' scenario includes the projected effects of New Zealand's ETS, assumes that nitrification inhibitors will be used in the agricultural sector, and that afforestation will increase from 3500 ha in 2009, to 30 000 ha by 2020 (Ministry for the Environment 2009).**

value in examining the tax and dividend scheme advocated by Dr Hansen, and discussing how such a scheme could be implemented in the New Zealand context.

## Tax and dividend

Under the tax and dividend scheme presented to New Zealand audiences by Dr Hansen (Hansen 2009a, b), a tax would be applied on the consumption of fossil fuels, calculated according to the amount of CO<sub>2</sub> emitted when burned. The tax would be imposed at the first point of sale (such as at the coal mine or oil well), or when the fuel was first introduced into the country. The tax would be passed on downstream, so that the cost of consumer goods would increase in proportion relative to the quantity of fossil fuels required to produce them. The tax collected from the first point of sale would be paid out as a monthly or yearly dividend to every legal resident who had provided, say, the Inland Revenue Department with a bank account number. Over time, the tax would be set to increase.

A tax and dividend scheme such as this raises a number of issues that can be grouped into three broad categories: issues relevant to any emissions scheme, issues relevant to an emissions tax (as opposed to cap-and-trade), and issues specific to the allocation of the tax income as a universal dividend. Each of these issues is discussed below.

## Issues relating to any emissions scheme

Putting a price on greenhouse gas emissions is the primary goal of almost all emissions reductions schemes since there is the strong expectation that increasing the price tends to reduce demand. However, for the particular case of New Zealand, putting a price on CO<sub>2</sub> alone (as advocated in the tax and dividend scheme proposed by Dr Hansen) addresses only half of New Zealand's greenhouse gas emissions. This is because around half of New Zealand's emissions (when quantified on a CO<sub>2</sub>-e basis) come collectively from nitrous oxide (N<sub>2</sub>O) and methane (CH<sub>4</sub>); see Figure 1. In turn, the bulk of New Zealand's

N<sub>2</sub>O and CH<sub>4</sub> emissions are due to the agricultural sector.

When asked how New Zealand should legislate for reducing N<sub>2</sub>O and CH<sub>4</sub> emissions (Hansen 2011), Dr. Hansen replied that because CO<sub>2</sub> is the most abundant anthropogenic greenhouse gas, the world should concentrate first on lowering CO<sub>2</sub> emissions, and then focus on greenhouse gases such as N<sub>2</sub>O and CH<sub>4</sub>. However, the economic costs of reaching a prescribed radiative forcing are smaller if emissions reductions can be spread across a range of greenhouse gases rather than focussing on CO<sub>2</sub> reductions alone (Meinshausen et al. 2006; Reilly et al.

1999). Moreover, should any future commitment periods under the Kyoto Protocol be agreed upon, such an approach would likely prevent New Zealand from meeting its commitments due to Kyoto Protocol regulations. Therefore, for New Zealand, N<sub>2</sub>O and CH<sub>4</sub> emissions cannot be neglected in any greenhouse gas emissions reduction scheme.

Some argue that emissions reductions in the agricultural sector should be incentivised via a price while others argue that because food is essential for society, it should not be included – or at least, treated differently from non-essential sectors. But New Zealand exports a lot of food, and as consumers in Europe become more environmentally aware, retailers are beginning to undertake food chain analyses of the products they stock. Therefore not including agriculture in an emissions scheme could be detrimental to New Zealand's food exports.

## Issues relating to an emissions tax

Taxes proposed for future introduction begin to be effective as soon as they can be predicted (Stoft 2008). This means that an emissions tax can be introduced at such a low rate that it would not significantly reduce emissions – but as long as the tax was set to rise, thus setting the price signal for the future, this would create certainty, and therefore presumably an incentive for the development of renewable technology. Additionally, taxes have been used for centuries, and the general public understands how they work. Emissions taxes do not require the development of new rules and new markets (Nordhaus 2011), but there is a disadvantage to this approach, because industrial and professional groups do not profit, so there is no one to advocate for the tax. Comparing this with cap-and-trade, which does require new rules and new markets, certain professions such as lawyers and accountants profit from running the scheme.

Finally, perhaps the biggest hurdle of all to implementing an emissions tax is public opposition to taxes. A dividend might sweeten the tax part of a tax and dividend scheme, but as discussed in the next section, paying out a dividend to the public raises issues of its own.

## Issues relating to tax and dividend

An advantage of a tax and dividend scheme, as described by Dr Hansen (Hansen 2009a, b), is that the scheme is fair to poorer people, who tend to consume less energy than the wealthy (for example, they tend to travel less), and therefore would end up

paying less tax than the wealthy. While this is true, the tax structure in New Zealand is such that the wealthy pay relatively more tax than the poor, so one approach to distribute a tax dividend would be to raise the threshold at which taxes are paid.

Another advantage would be that people could choose to profit from the dividend by consuming less fossil fuel (say by switching to a power company that used renewable sources of energy rather than fossil fuels to generate electricity) so that the carbon tax paid was less than the dividend they received. The dividend could contribute towards lifestyle changes that would lead to a decreased reliance on fossil fuels (such as insulating homes or installing solar panels) so that over time, as an individual's consumption of fossil fuels decreased, they would pay less tax, but still receive the same dividend as everyone else. Of course if everyone did the same thing, the total tax revenue, and therefore per capita dividend, would decrease.

However, in reality would paying a dividend change consumer behaviour? In 2009, New Zealand's gross greenhouse gas emissions were 70.6 Mt CO<sub>2</sub>-e (Ministry for the Environment 2011a). Assuming a population of 4.4 million people (Statistics New Zealand 2011), this equates to 16 tonnes of CO<sub>2</sub>-e emissions per person, per year. Now, assuming that an emissions tax was phased in slowly and so began at a low rate of \$10 per tonne of CO<sub>2</sub>-e emissions, this would provide a dividend of \$160 per capita in the first year – hardly enough to get solar panels installed. Giving a wealthy person \$160 would represent a very minor tax cut relative to their income, and as for the poor, who is to say that they would not use it to buy food or other essential items?

While no specific studies have been done for the New Zealand case, a severe tax would set the expectation that trade-exposed and carbon-intensive businesses would likely be forced to move offshore. Even though a more stringent tax would result in a larger dividend than \$160 per capita per year, if that higher tax would force companies offshore, the dividend would not be large enough to replace a worker's lost income. The need to protect businesses from an emissions scheme returns to the fact that to make the cuts necessary to mitigate climate change, the economy would have to change, proving once again how difficult this issue is.

Under the ETS, carbon-intensive and trade-exposed industries are protected by the allocation of free NZUs. Essentially, this means that the government chooses on behalf of the public which businesses to subsidise. Under a fee and dividend scheme, consumers would have the discretion to choose who they subsidise (depending on how they choose to spend their dividend), based on, say, who produces their products using renewable energy over fossil fuels. This reveals an important assumption underlying a tax and dividend scheme: it assumes that companies are willing and able to invest in researching and producing products that are not fossil fuel-intensive. Instead of paying out a dividend, the government could potentially collect a tax from polluters and use it to invest in renewable technology – but again, this removes the consumer discretion enabled by a tax and dividend scheme.

Consumer discretion aside, using tax revenue to address New Zealand's specific problems with regards to greenhouse gas emissions mitigation (rather than distributing a dividend to the

public) may well lead to better climate protection if companies do not foster such mitigation, and if the public do not lower their use of fossil fuels. But which is more politically viable? The carbon tax and dividend scheme advocated by Dr Hansen only differs from a straight carbon tax in that the tax revenue goes back to the public, and this aspect is surely designed to get voters onside. Paying out a dividend has the advantage of keeping the scheme transparent, whereas using tax revenue to develop renewable technology would likely make it less attractive in the political context.

In all of this, we see that consumer, industry and Government perspectives are all very different, and perhaps this is Dr Hansen's point: a tax and dividend scheme might make people think about their behaviour as consumers, and give the public a greater role in combating climate change. Again we return to the question: do people want to change their behaviour? While the environmental movement has been alive and well in New Zealand for quite some time, a large segment of the New Zealand public continue to deny the existence of anthropogenic climate change, or at least the need to do something about it. Additionally, there are even more people in New Zealand who don't understand the basic science underlying climate change and the pressing need to act now – perhaps thanks to popular media, who traditionally try to report 'both sides of the story' (for example, report the views of a climate scientist, followed by the views of a climate change denier) – or perhaps because in view of problems faced by New Zealand such as poverty and domestic violence, climate change simply doesn't register.

## Conclusions

Because New Zealand already has the ETS in place and needs an emissions scheme that covers all greenhouse gases and not just CO<sub>2</sub>, as well as other reasons outlined above, the tax and dividend scheme advocated by Dr Hansen is, in my view, unlikely to be attractive to policy makers in New Zealand in the near future. That is not to say that it would not work in the USA, Dr Hansen's country of residence. Now that Australia has implemented climate change legislation (a carbon tax, to be replaced by an emissions trading scheme in 2015 (Australian Government Department of Sustainability 2011), New Zealand's position has changed; it is not unimaginable that New Zealand might one day tax industries for their greenhouse gas emissions. Under this scenario, tax revenue should be used to address New Zealand's specific issues with regards to greenhouse gas emissions mitigation, in combination with tax cuts rather than a dividend.

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