Ministry for the Environment
Manatū Mō Te Taiao

PO Box 10362, Wellington 6143
Website: www.mfe.govt.nz
Freephone: 0800 499 700

20-D-02335

s 9(2)(a)
Victoria University of Wellington
s 9(2)(a)

Dear s 9(2)(a)

Thank you for your email of 27 November 2020 to the Ministry of the Environment (the Ministry) requesting the following under the Official Information Act 1982 (the Act):

> *"Any information held relating to the consideration of a policy option under which the government would allocate greenhouse gas emission permits to individual persons or households."*
> *"To help in finding the requested information, the main terms used for the above concept and proposed schemes in public discussion are: 'carbon rationing', 'personal carbon trading', 'personal carbon allowances', 'domestic tradable quotas', and 'tradable energy quotas'."*

The Ministry has identified 15 items in scope of your request, as listed in the attached schedule. Some information within these documents has been withheld under the following sections of the Act:

9(2)(a)	to protect the privacy of natural persons, including that of deceased natural persons.
18(d)	that the information requested is or will soon be publicly available

In terms of section 9(1) of the Act, I am satisfied that the withholding of this information is not outweighed by other considerations that render it desirable to make the information available in the public interest.

You have the right to seek an investigation and review by the Office of the Ombudsman of my decision to withhold information relating to this request, in accordance with section 28(3) of the Act. The relevant details can be found on its website at: www.ombudsman.parliament.nz.

Please note that due to the public interest in our work the Ministry for the Environment publishes responses to requests for official information on our OIA responses page shortly after the response has been sent. If you have any queries about this, please feel free to contact our Ministerial Services team: ministerials@mfe.govt.nz.

Yours sincerely

Scott Gulliver
Director (Acting), Climate Change

Document schedule

No.	Date	Content	Decision	OIA Section/s applied (if withholding information)	Other significant details
1	May 1990	Report; Economic Instruments and the Greenhouse Effect	Refused	s18(d)	www.wgtn.ac.nz/som/research/workingpapers/publications/pre2000publications/3-90_I.G._Bertram.pdf
2	11 January 2005	Report; Domestic Tradable Quotas- Tyndall Centre	Refused	s18(d)	www.researchgate.net/publication/237228029_Domestic_Tradable_Quotas_A_policy_instrument_for_reducing_greenhouse_gas_emissions_from_energy_use
3	12 September 2006	Email subject line: CC becomes real and urgent even to some economists	Released in part	s9(2)(a)	
4	25 September 2006	Email subject line: New Zealand's negotiating position in forthcoming climate talks	Released in full	N/A	
4.1	August 2006	Email attachment: Climate Change- Canterbury Conference Paper V5.doc	Released in full	N/A	
5	November 2006	Report; A Rough Guide to Individual Carbon Trading	Refused	s18(d)	www.flemingpolicycentre.org.uk/RoughGuide.pdf
6	13 December 2006	Email subject line: Initiatives for ET, NI and Global credibility.	Released in full	N/A	
6.1	13 December 2006	Email Attachment: A List of Potential Sustainability Initiatives for Economic Transformation, National Identity and Global Credibility	Released in part	Out of scope, relevant material provided as excerpt	Excerpt provided in Appendix 1
7	8 March 2007	Email Subject line: EDS Auckland Climate Change Seminar transcript	Released in part	s9(2)(a)	
7.1	23 February 2007	Email attachment: EDS Auckland Climate Change Seminar transcript	Released in part	s9(2)(a)	

No.	Date	Content	Decision	OIA Section/s applied (if withholding information)	Other significant details
8	2007	Meeting minutes; CLIMATE CHANGE	Released in part	Out of scope, relevant material provided as excerpt	Excerpt provided in Appendix 1 Comment was recorded as being made at a public meeting in 2007
9	23 July 2007	Volume II Climate Change the citizen's agenda- Evidence Report	Refused	s18(d)	https://publications.parliament.uk/pa/cm200607/cmselect/cmenvfru/88/88ii.pdf
10	6 August 2007	Ministerial; 07-M-0740 [s 9(2)(a)] Individual Carbon Trading	Released in part	s9(2)(a)	
11	August 2011	ETS Review Panel. 2011. ETS Review 2011 Summary of submissions. Ministry for the Environment. Wellington Draft Report	Refused	s18(d)	www.mfe.govt.nz/sites/default/files/media/Climate%20Change/summary-of-submissions.pdf
12	28 September 2020	Ministerial 20-M-01745 [s 9(2)(a)]	Released in part	s9(2)(a)	

Out of Scope

From: Cath Wallace <Cath.Wallace@vuw.ac.nz>
Sent: Tuesday, 12 September 2006 6:40 pm
To: s 9(2)(a) ; Ralph Chapman; Jonathan Boston; Adrian Macey; s 9(2)(a) Chris Livesey; s 9(2)(a) ; s 9(2)(a) ; s 9(2)(a) ; Jennifer Macmillan; John Scott; s 9(2)(a) ; Julie Iommi; s 9(2)(a) ; Maureen Revell; s 9(2)(a) ; Peter Barrett; s 9(2)(a) ; s 9(2)(a) ; Phil Gurnsey; s 9(2)(a) ; Sean Weaver; s 9(2)(a) ; s 9(2)(a) Stuart Dymond; s 9(2)(a)
Cc: Ralph Chapman
Subject: RE: CC becomes real and urgent even to some economists

Dear all,
We know from fisheries catch limit setting and the quota system that the big issue is whether the cap it set with backbone and integrity (which it isn't)

AND there are huge issues around the distributional implications of any cap and trade system. Grandparenting needs to be called what it is, transferring huge amounts of wealth to polluters.

In NZ we will have the added complication of Treaty of Waitangi claims which could bog everything down. A tax or a regulatory regime avoids that particular hot potato.

If we do have a cap and trade system then we should either au tion the permits or we should follow the British trial of smart carbon credit cards for all the citizenary.

Cheers,

Cath

From: s 9(2)(a) s 9(2)(a)
Sent: Tuesday, 12 September 2006 10:24 a m.
To: Ralph Chapman; Jonathan Boston; 'Adrian Macey'; s 9(2)(a) '; Cath Wallace; s 9(2)(a) '; 'Chris Livesey' s 9(2)(a) '; s 9(2)(a) s 9(2)(a) s 9(2)(a) 'Jennifer Macmillan'; 'John Scott'; s 9(2)(a) '; 'Julie Iommi'; s 9(2)(a) '; Maureen Revell; s 9(2)(a) s 9(2)(a) Peter Barrett; s 9(2)(a) '; s 9(2)(a) 'Phil Gurnsey'; s 9(2)(a) '; Sean Weaver; s 9(2)(a) '; 'Stuart Dymond'; s 9(2)(a)
Cc: Ralph Chapman
Subject: Re: CC b comes real and urgent even to some economists

Hi Ralph

Of course, in 2002 NZ politicians did decide this. The "pity" is in 2005 when they decided to do neither. My read on this emissions trading versus carbon charge issue is that, in the first instance, those more worried about emissions and less about mitiga ion costs are attracted to the cap aspect of emissions trading. Those who care less about emissions and more about mitigation costs prefer the tax. In the end the political arguments in either case would come down to setting the amount.... of the emissions cap or the rate of the tax. A struggle in either event I think. Hence some proposals to have both....i.e. a hybrid.

On the political feasibility grandparenting point that they make, I think this is correct, e.g. as the EU ETS experience has shown. The EU ETS got up when years of attempts at carbon or energy taxes hadn't. So political feasibility is not to be dismissed. Also the carbon tax route is not without its political elements, in particular the distribution of revenues. Again, in this sense the two schemes can be seen as similar. The big difference between them is the dynamic engagement of business....emitters, solution providers and the finance sector.

All this said, as you know from my Policy Proposal, I favour international emissions trading and NZ's engagement with the international carbon market as soon as possible. It's about efficiency.... which economists should like. But I do not

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agree with using grandparenting to attract in business and others with giveaways. In practice, I believe this should only be contemplated to address international competitiveness issues, where and for how long they exist. This sorted, it is then "smart revenue recycling" that can win public support and hence political acceptability.

I look forward to your and others' thoughts.

Cheers,
s 9(2)
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s 9(2)(a)

s 9(2)(a)

----- Original Message -----
From: Ralph Chapman
To: 'Jonathan Boston' ; 'Adrian Macey' ; s 9(2)(a) ' ; 'Cath Wallace' ; s 9(2)(a) ' ; 'Chris Livesey' ; s 9(2)(a) ' ; 'Jennifer Macmillan' ; 'John Scott' ; s 9(2)(a) ' ; 'Julie Iommi' ; s 9(2)(a) ' ; 'Maureen Revell' ; s 9(2)(a) ; 'Phil Gurnsey' ; s 9(2)(a) ; 'Sean Weaver' ; 'Simon Terry' ; s 9(2)(a) ' ; 'Stuart Dymond' ; s 9(2)(a) '
Cc: Ralph VUW-office
Sent: Tuesday, September 12, 2006 12:08 AM
Subject: CC becomes real and urgent even to some economists

This week's Economist (Sep 9-15) has a cover story and special report on climate change, entitled "The heat is on." Of course, the Economist is a few years behind the times, but at least it is finally getting it almost right.
They conclude that "…the chances of serious consequences are high enough to make it worth spending the (not exorbitant) sums needed to try to mitigate climate change." (Survey, p5). That makes welcome sense, although the words "try to" have a menacing and justified ring to them.

Note also that they prefer a C tax to emissions trading (Editorial, p9) but observant long-time readers of the Economist already knew that. (It's a pity NZ politicians did not reach the same conclusion.)
They note that "the more volatile cap-and-trade system, however, is easier to sell to producers, who can get free allowances when the scheme is introduced."
Cheers
Ralph

Dr Ralph Chapman • Maarama Consulting Ltd • 34 Maarama Cres, Wellington, 2, New Zealand / Aoteaora • Tel s 9(2)(a)
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No virus found in this incoming message.
Checked by AVG Free Edition.
Version: 7.1.394 / Virus Database: 268.9.4/375 - Release Date: 25/06/2006

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No virus found in this outgoing message.
Checked by AVG Free Edition.
Version: 7.1.405 / Virus Database: 268.12.2/442 - Release Date: 8/09/2006

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Out of Scope

From: Jonathan Boston <Jonathan.Boston@vuw.ac.nz>
Sent: Monday, 25 September 2006 2:19 pm
To: MACEY, Adrian (ENV); DYMOND, Stuart (ENV); Phil Gurnsey
Cc: Ralph Chapman; Ken Piddington; Cath Wallace; Sean Weaver
Subject: New Zealand's negotiating position in forthcoming climate change talks
Attachments: Climate Change - Canterbury Conference Paper V5.doc

Dear Adrian

Thanks for the excellent briefing last Friday at MFAT on the forthcoming Nairobi meetings. You asked for feedback on matters relating to NZ's position in the forthcoming international meetings on climate change. As you will appreciate, I do not have the background knowledge and expertise to contribute to many of the matters discussed on Friday but I would like to offer some brief comments on one or two issues.

1. Global targets and GHG emissions caps beyond 2012:

NZ should, in my view, adopt and support the EU's 2 degrees C warming 'cap': (i.e. the NZ government should commit itself to encouraging global policy action that will ensure that the global mean surface temperature does not increase by more than 2C above pre-industrial levels). Supporting the EU position can be justified on a number of grounds:

- It is a well established position, with the support of all EU countries and some other countries;
- It is based on an analysis of the likely risks associated with different temperature increases (i.e. above pre-industrial levels);
- It is still (probably) achievable -- i.e if firm and effective global action is taken early enough;
- It provides a good indication of the level at which we need to stabilize the concentrations of C02 and other GHGs in the atmosphere, and hence has reasonably clear implications for emissions reductions; and
- There is no competing target currently that is likely to win a wider measure of international support.

Having said this, I realize that even 2 degrees C of warming (above pre-industrial levels) may commit the planet to large-scale, irreversible and highly damaging changes - so I do not wish to suggest that it is a 'safe' level. What is important to emphasize, however, is that the EU cap is a maximum, not a 'target' in the normal sense. The aim should be to stay as far below 2 degrees of warming as is possible.

2. Following on from (1) the NZ government should advocate internationally setting GHG stabilization thresholds that are compatible with avoiding more than 2C of warming. I am happy to leave it those with greater technical expertise than I to determine exactly what the relevant stabilization thresholds should be -- but the evidence I have read (see my attached paper) -- and underscored recently by a report from the UK Tyndall Centre -- suggests that we need to achieve CO2 stabilisation levels well below 450ppm and quite possibly below 400ppm to have even a 50% chance of staying within the 2 degrees cap. (Incidentally, stabilization and peaking need to be distinguished -- there is plainly no chance of avoiding a peak well above 400ppm.)

3. The CO2 (and related CO2 equivalent) stabilisation targets that are agreed will have clear implications for the cummulative volume of GHG emissions that can be accommodated during specific periods of time (e.g. from now until 2050), given assumptions about carbon sinks, etc etc etc. Having established a global carbon budget, and related path for emissions reductions, the NZ government needs to take a view (like the British government has already done) on what represents a fair contribution by NZ to the global effort. In this regard, there needs to be a clear, transparent formula with explicit emissions caps (over specific periods of time), with clear justifications for these caps (and any associated offsets). If NZ wants to be given some kind of dispensation to take account of the distinctive nature of our emissions profile, then this needs to be clearly signalled, appropriately justified, and articulated within the parameters set out above. No doubt virtually every country will want some kind of dispensation on some ground or other!

4. The various points above should provide a framework within which various market-based mechanisms can be used to help achieve emission reductions and rebuild carbon sinks.

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I hope these points are of use. I realize that the current NZ government is likely to be reluctant to endorse such a strategy, but in the absence of a concrete position on global temperature caps, stabilisation targets and emissions caps, I fear that we are merely left with good intentions ….

Kind regards

Jonathan

<<Climate Change - Canterbury Conference Paper V5.doc>>

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20-D-02335 Appendix 1: document 4.1

The Public Interest, Climate Change and the Future of the Planet: Reducing the Sins of Emission

Professor Jonathan Boston
Institute of Policy Studies
Victoria University of Wellington

jonathan.boston@vuw.ac.nz

August 2006

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Paper prepared for "In the Public Interest Conference 2006: A Tribute to Emeritus Professor Keith Jackson", University of Canterbury, Christchurch, 25-26 August 2006

To turn back the climate clock seventy million years in the course of a few centuries is not a thing to be undertaken lightly.

R.T. Pierrehumbert (2006, p.4)

Introduction

This paper addresses what many leading politicians and scientists regard as the greatest challenge facing humanity today: the risk of rapid, human-induced climate change. The former Vice-President of the United States, Al Gore, has argued that the threat of significant global warming over the coming century represents a "planetary emergency" (2006). A careful, sober reading of recent scientific evidence suggests that this claim is no exaggeration. Unfortunately, most of the world's citizens have little awareness or understanding of the relevant scientific issues, nor the magnitude and urgency of the policy responses that are required to avert a possible calamity.[1]

The argument in this paper can be summarized as follows:

- there is reliable evidence that the global mean temperature has risen significantly during the past century;
- the overwhelming majority of those with the relevant scientific expertise believe that most of this warming can be attributed to human activities, in particular the emission of greenhouse gases (GHGs) into the Earth's atmosphere;
- if dangerous anthropogenic interference with the Earth's climate is to be avoided, urgent action is required both to reduce dramatically GHG emissions and to expand carbon sinks;
- although it is in the long-term interests of humanity for concerted and strenuous action to be taken to mitigate and adapt to climate change, there can be little confidence that the global community will rise to the challenge; this is partly because narrow short-term sectional interests are prevailing over the wider public interest; and
- New Zealand has a responsibility as a good international citizen, to contribute to global action to avoid dangerous anthropogenic climate change.

Before developing these arguments further, let me comment briefly on two matters.

First, I owe a great debt to Professor Keith Jackson. Amongst other things, he inspired me to read widely, think broadly and question current conventions. Equally, he helped me to integrate my youthful environmental passions and my academic interests, and encouraged me to take an inter-disciplinary approach to complex issues. Although I certainly cannot attribute my current preoccupation with climate change and its impacts to any of his lectures or publications, it is undoubtedly a topic that stretches the mind, wrenches the heart and embraces the fascinating world of inter-disciplinary inquiry.

Second, there is a rich and varied literature on the meaning and relevance of 'the public interest', and its relationship to related political concepts like 'the national interest' and the 'common good' (see, for instance, Barry, 1965; Cochren, 1974; Friedrich, 1966). I

[1] There is a rapidly growing literature on climate change that is readily accessible to those without specialist scientific training. See, for instance, Diamond (2005), Flannery (2005), Gore (2006), Houghton (2004), Kluger (2006), Kolbert (2006), Lovelock (2006), Weaver (2006) and Wright (2004).

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have no intention of trying to survey this literature here. It is my contention, however, that the concept of the public interest is meaningful and important – both for analytical and normative purposes. In broad terms, if an action or policy is claimed to be in the public interest, then what is typically being asserted is that this particular action or policy will yield *the greatest net benefit to the public* (i.e. when compared with other possible actions or policies). The nature and scope of what constitutes the 'public' will vary according to the context of the action or policy in question. In the case of climate change, the public is the whole of humanity, and certainly includes all those alive today, if not also all those who have yet to be born.

My contention, in short, is that it is in the public interest to avoid dangerous anthropogenic climate change. This is because the costs (economic, social, political and ecological) of such an eventuality are very likely to be much greater than the costs of trying to avoid it (Houghton, 2004; Stern, 2006a). Moreover, even though the costs of inaction are impossible to calculate with any confidence, the risk of large scale, irreversible damage to critical planetary systems (such as entire marine food chains) is so great, that it would be morally irresponsible not to take a precautionary approach. Politically, the fundamental dilemma is that the costs of mitigation are relatively certain, visible, concentrated and short-term whereas the benefits are less certain, less visible, diffuse and long-term (Boston, 2006). This disjunction between the costs and benefits of collective action to combat global warming is at the heart of the political economy of climate change.

The Scientific Debate: The Evidence of Global Warming

I realize that the scientific issues surrounding climate change are complex and, in some quarters, controversial. Accordingly, let me commence with two quotes. The first is from John Whitehead, the Secretary to the Treasury in New Zealand:

> Much of the debate in New Zealand on climate change has focused on Kyoto obligations, about whether climate change is happening, and whether it is human induced. It is too often regarded as a phenomenon that will have limited consequences for New Zealand. It is my contention that these are yesterday's discussions … the overwhelming consensus is that human activity is increasing the concentrations of greenhouse gases in the atmosphere, and causing warming … [with] potentially … serious economic consequences (2006a).

Whitehead's reading of the evidence is entirely correct. Unfortunately, here in New Zealand there are many within the policy community who seem determined (for reasons that are hard to explain) to continue yesterday's debates.

The second quote is from a *Statement* issued in mid 2005 by the heads of 11 of the world's leading scientific academies, including those of United States National Academy of Sciences, the Royal Societies of Canada and the United Kingdom, and the Chinese, Indian and Russian Academy of Sciences. It is relatively rare for joint declarations of this kind to be issued, and it is reasonable to assume that such statements provide a reliable and authoritative summary of current scientific opinion:

> There will always be uncertainty in understanding a system as complex as the world's climate. However, there is now strong evidence that significant global

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warming is occurring. The evidence comes from direct measurements of rising surface air temperatures and subsurface ocean temperatures, and from phenomena such as increases in average global sea levels, retreating glaciers, and changes to many physical and biological systems. It is likely that most of the warming in recent decades can be attributed to human activities. This warming has already led to changes in the Earth's climate.

The existence of greenhouse gases in the atmosphere is vital to life on Earth – in their absence average temperatures would be about 30 centigrade degrees lower than they are today. But human activities are now causing atmospheric concentrations of greenhouse gases – including carbon dioxide, methane, tropospheric ozone, and nitrous oxide – to rise well above pre-industrial levels. Carbon dioxide levels have increased from 280ppm [parts per million] in 1750 to over 375ppm today – higher than any previous levels that can be reliably measured (i.e. in the last 420,000 years).

Increasing greenhouse gases are causing temperatures to rise; the Earth's surface warmed by approximately 0.6 centigrade degrees over the twentieth century. The Intergovernmental Panel on Climate Change (IPCC) projected that the average global surface temperature will continue to increase to between 1.4 centigrade degrees and 5.8 centigrade degrees above 1990 levels, by 2100.

Various aspects of this *Statement* deserve amplification and comment:

1. The existence of a natural 'greenhouse effect' has been known about for almost two centuries. In brief, GHGs in the atmosphere, such as water vapour, carbon dioxide and methane, absorb infra-red or 'heat' radiation from the Earth's surface (see Flannery, 2005; Houghton, 2004). This process acts, in effect, rather like a blanket (or the glass in a greenhouse), keeping the Earth's surface warmer than would otherwise be the case. As the quantity of GHGs in the atmosphere increases, so too does the warming of the Earth's surface, both land and sea, and lower atmosphere (other things being equal). There is no serious scientific debate about this 'greenhouse effect' – just as there is no serious scientific debate about the fact that the Earth is round rather than flat. There is, however, debate about the sensitivity of the Earth's climate system to increasing levels of GHGs (Soden, 2006; Steffen, 2006).[2] That is to say, there is uncertainty about just how rapidly the global mean surface temperature will increase as a result of there being more CO_2 and other GHGs in the atmosphere.[3] This uncertainty is due largely to the sheer complexity of the climate system, the uncertain nature and role of various negative and positive feedback mechanisms, and our limited understanding of what the crucial 'tipping points' might be and when they might be crossed. The potential tipping points include (see Flannery, 2005; Pittock, 2006; Steffen, 2006):

[2] Some global warming skeptics claim that recent climatic changes are due primarily, or even wholly, to natural causes, like changes in solar output or other forces that we have yet to fully understand, and thus have little or nothing to do with the activities of human beings (Byatt, et. al., 2006; The Lavoisier Group Inc., 2006; Van der Lingen, 2005). There is little firm scientific evidence to support such claims.

[3] Technically, climate sensitivity describes how strongly the climate responds to GHG forcing, and specifically to "the equilibrium rise in global mean temperatures resulting from the doubling in atmospheric CO_2 concentration over pre-industrial levels" (Steffen, 2006).

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- the complete melting during summer of Arctic sea ice (now thought likely within 10-60 years);
- significant melting of the Greenland and West Antarctic ice sheets;[4]
- the melting of permafrost, particularly in Siberia, with the consequent risk that immense quantities of methane, currently trapped in the soil, will be released into the atmosphere;[5]
- the weakening and eventual shut-down of the Thermohaline Circulation or ocean conveyor that circulates water around the globe (prompted, for instance, by freshwater from the melting of the Greenland ice sheet);
- the destruction of the Amazon rainforest and other significant carbon sinks; and
- the release of methane hydrates from deep ocean sediments.

2. Since the *Statement* was issued, CO_2 levels have reached over 380ppm and during the past five years having been rising at close to 2 ppm per year (Lowe, 2006). In the past year the rate of increase was 2.5ppm.[6] In the absence of effective policy action to reduce GHG emissions, CO_2 concentrations in the atmosphere are very likely to reach twice the pre-industrial level within 60 years. At 380ppm, CO_2 levels are probably higher than they have been at any time during the past 20 million years; a level of 560ppm would return the Earth's atmosphere to a state not witnessed for possibly 40 million years (Barrett, 2006). The current increase in GHG concentrations is largely due to the burning of fossil fuels – oil, coal and natural gas – by human beings. For instance, global emissions of CO_2 from the burning of fossil fuels are in excess of 25 billion tonnes per annum. Such emissions are rising at about 2% per annum. The International Energy Agency has predicted that CO_2 emissions will increase by over 60% between 2002 and 2030. GHG emissions per capita vary greatly between countries – in the late 1990s the range was from around 0.2 tonnes of carbon per capita in relatively poor developing countries like India, to 2.5 tonnes in Europe and 5.5 tonnes in the US.

3. Equally important, CO_2 remains in the atmosphere for a considerable time: approximately 25% of the CO_2 produced today will still be in the atmosphere 200 years from now, and a small proportion will remain for 100,000 years or more (Archer, 2005). Accordingly, the CO_2 released into the atmosphere since the industrial revolution will continue to influence the Earth's climate and related systems (e.g. sea-level rise) for a long time, thus making further significant climate change inevitable. And the magnitude of this change will increase every year the international community delays taking strong and effective action to avoid or reduce emissions and/or offset emissions via carbon sinks.[7] One

[4] The most recent scientific evidence suggests that the rate at which the Greenland ice sheet is melting is accelerating, with a current annual loss of 57 cubic miles of ice per annum (see Chen, et al., 2006).
[5] It is estimated that there could be around 70 billion tons of stored carbon in the Siberian tundra, about ten times the amount currently released annually as a result of human activity.
[6] Yearly increases in CO_2 concentrations fluctuate, so it will not be clear for some years whether the rate of increase is accelerating.
[7] Climate modelers have examined the likely outcome if GHG concentrations had been stabilized in 2000. The results point to further global warming of another 0.5^0C, with the sea-level rising significantly by the end of the 21st century caused by thermal expansion of the oceans and glacial melt (see Trenberth, 2006).

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implication of this huge inertia in the climate system is that we will have no choice but to adapt to climate change. Such adaptation will be expensive. Globally, for instance, immense investments will be needed over the coming decades in such areas as urban infrastructure (e.g. drainage, transportation, etc.) to cope with more severe weather events and sea-level rises.

4. The claim in the *Statement* that it is "likely that most of the warming in recent decades can be attributed to human activities" remains under challenge in some quarters. However, the overwhelming preponderance of scientific evidence suggests that the rate of increase in the global mean temperature during the past century is well outside the range of known natural variability. Hence, to quote the US National Academy of Sciences (2001):

> The IPCC's conclusion that most of the observed warming of the last 50 years is likely to have been due to the increase in greenhouse gas concentrations accurately reflects the current thinking of the scientific community on this issue.

Such a conclusion is highlighted by the fact that not a single paper in a large sample of peer-reviewed scientific journal articles between 1993 and 2003 refuted the consensus position as summarized by the National Academy of Sciences (Oreskes, 2004). This is not to suggest that there are no remaining uncertainties, but it does imply that the basic theory is largely uncontested and that the overall picture is clear. As scientific understanding improves, the possible grounds for global-warming skepticism are diminishing rapidly. Such grounds have included the claim that the warming trend in recent decades, as measured by weather stations, is actually due to the so-called 'urban heat island effect'; the claim that there is a discrepancy between surface temperature data and satellite data; and the proposition that the upper atmosphere will become drier as it warms, resulting in water vapour acting as a negative, rather than a positive, feedback mechanism. All such claims have been found wanting (see Rahmstorf, 2004; Revkin, 2006; Stern, 2006b; Revkin, 2006; US Climate Change Science Program, 2006).

5. The Fourth Assessment Report of the UN IPCC – which will be published in early-to mid 2007 – is likely to suggest that the evidence of global warming is even stronger than in 2001 (when it produced its Third Assessment Report) and that temperatures are expected to rise by 2100 by at least 2^0 C above 1990 levels in the absence of concerted policy action – and probably more than this. Indeed, some recent climate modeling suggests that the global mean temperature could eventually increase by 5-8^{0}C, and even as much as 11.5^{0}C if no corrective action is taken to reduce GHG emissions (Stainforth, et al., 2005; see also Lovelock, 2006). If CO_2 concentrations were to double from their pre-industrial levels and stabilize at around 550ppm, most models project equilibrium temperature increases averaging around 3-4^{0}C. Note that these are *mean* global surface temperatures. A mean rise of 2^0C will result in much greater changes in some parts of the globe, such as the Arctic – as is already in evidence. By way of comparison, the difference between global mean temperatures during an ice age and an interglacial period is about 5-6^{0}C. Thus, if global mean temperatures were to rise an additional 2-3^{0}C during the coming century, this will be the equivalent of half an ice age within 100 years – a very rapid change by historic standards.

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This poses major issues for ecosystem adaptation (see Steffen, 2006), not to mention the many problems for human beings (e.g. in terms of severe water shortages, disruption to food production, damage to infrastructure, negative health impacts, loss of natural heritage, etc.).

6. Since the *Statement* was issued, we now know that 2005 was the hottest (or second hottest) year around the world since records began; the first six months of 2006 were the warmest first half of any year in the continental United States since records began in 1895; and many parts of Europe recorded their hottest ever July in 2006. For instance, mean temperatures in England and Wales in July were almost 0.5^0C higher than previously recorded, at around 19^0C.

7. Additionally, there have been some extraordinary climatic events occurring all over the globe in recent years. To give but one illustration: the Island of Svalbard in the Arctic Ocean above Norway – at 80 degrees north – has been recording some phenomenal temperatures this year. Some months have had average temperatures as much as 12.6^0C above the relevant monthly means (Mann and Jones, 2006). The equivalent would be for Christchurch to have a July mean temperature well in excess of January mean temperatures. The April 2006 mean temperature on Svalbard was almost five standard deviations above the mean, what is known statistically as a '5 sigma event'. On the basis of stationary 'normal' statistics, this is astronomically improbable (< 1 in 10^6 or less than 1 in a million) – as rare, in fact, as the 2003 summer heat wave in Europe (which was a 5 sigma event in Switzerland, and a 3 sigma event over much of the rest of Europe). How do we account for these extraordinary temperatures in Svalbard? Part of the answer, it seems, lies in the relative lack of sea ice near the island during the winter and spring. This is no doubt connected to the retreat of the Arctic ice cap – which has lost up to 20% of its area and about 40% of its thickness over the past four decades, and is currently retreating at a rapid rate (an area about the size of New Zealand a year) (see Flannery, 2005; Steffen, 2006; *The Guardian*, 16 May 2006).

Should such evidence of global warming be of any concern? The answer in my view is very simple. Global warming of the magnitudes predicted during the coming century will have very significant ecological, social, economic and political impacts. To be sure, some of these impacts are likely to be positive, at least initially. For instance, the high northern latitudes of Alaska, Canada and Russia will have longer growing seasons. Warmer winters in most parts of the northern hemisphere will also reduce the need for heating, thus lowering costs and GHG emissions. Further, because higher concentrations of CO_2 in the atmosphere tend to have a fertilizing effect, some crop yields can be expected to increase (assuming that sufficient water is available).[8]

But while some positive impacts are likely, especially in the short-to-medium term, there is a large body of scientific evidence suggesting that the overall or net impact of global warming will be negative, especially in the longer-term (see Watson, et al., 2001). Put bluntly, the negative impacts are expected to *swamp* the positive impacts (quite literally in the case of sea-level rise!); they are also expected to accelerate in their scope and

[8] Recent evidence suggests that this fertilizing effect is much less than originally believed (see http://www.sciencedaily.com/releases/2006/07/060731165637.htm).

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scale over time. To compound matters, many of the negative impacts will be irreversible – at least for centuries if not millenia.

Not all policy analysts accept the proposition that the overall impact of global warming will be negative. There are a number of reasons for this. Some simply reject the available scientific evidence, claiming that it is too uncertain, vague and unduly alarmist. Others reject the results of the various impact studies that have been undertaken, claiming that they are theoretical, flawed or exaggerated – or that human beings will readily adapt to the predicted impacts using new technologies and other means. Yet others apply a discount rate that renders even catastrophic damage later in this century irrelevant in any cost-benefit analysis. In my view, if humanity is faced with even a low risk (e.g. 10%) of potentially catastrophic impacts (such as a 5-10 metre rise in sea levels) – and, moreover, impacts that can be expected to persist for hundreds of thousands of years – such impacts must be given proper weight in any meaningful assessment. Applying a discount rate that makes them invisible and inconsequential is neither morally tenable nor analytically acceptable.

To illustrate this point about discounting: suppose that $1,000 could either save one human life today or enable action to prevent the complete annihilation of human life in 500 years. As Pierrehumbert (2006, p.5) highlights, if a 5% discount rate is applied then the value of 10 billion lives in 500 years would be worth less than one life today. But surely no one with any sense of ethical proportion would give the same weight to the total destruction of humanity and the loss of one life, merely because of a time difference. This suggests that assessments need to incorporate a range of discount rates (including zero) or perhaps time varying discount rates.[9]

There is a need for appropriate caution in attributing specific climatic events (and related phenomena) to human-induced global warming. Nevertheless, there is evidence that climate change is likely to be playing a role in a range of damaging events and outcomes (see Schellnhuber et al., 2006). Let me mention a few:

1. The insurance industry estimates that the economic losses from natural disasters are doubling every 10 years, with most of these losses related to climatic events. In recent years severe storms have inflicted large-scale and costly damage in many parts of the world. For instance, the economic losses from hurricane Katrina are estimated at US$125 billion, with insured losses of around $45 billion (Grace, 2006; see also Lloyds, 2006).

2. Droughts in various parts of the world are becoming more protracted and intense, putting the lives and livelihoods of millions of people at risk. Related to this, desertification is increasing in semi-arid parts of Asia and Africa, and savannization is occurring in some areas of tropical rainforest, including the Amazon.

[9] The use of cost-benefit analysis in relation to climate change policy issues has been the subject of much debate since the early 1990s. For a useful review of the analytical issues, including the problems of assessing the social cost of carbon, see the chapters by Pearce, Mendelsohn and Tol in Helm (2005). Note that many integrated assessment models (including the so-called guardrail method) support normative bounds on any number of not necessarily commensurate criteria and thus avoid some of the problems associated with monetarization and discounting.

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3. Significant damage is being inflicted upon the world's coral reefs, both from the effects of warmer seas but also from the acidification of the oceans (see below).

4. Wildfires have increased dramatically in recent years in many countries, including Australia, Canada and the US – with around 60,000 in the US during the first six months of 2006, an increase of over 50% on the previous year.

5. The intensity and duration of storms appears to be increasing, with more category 4 and 5 hurricanes and more intense precipitation events – of both rain and snow (Trenberth, 2006).[10]

6. Heat waves are becoming longer and more intense, contributing to a significant loss of human life. Recent research, for instance, suggests that there we e "about 45,000 excess deaths across Europe" during the 2003 summer heat wave (Hales and Woodward, 2006).

7. Most of the world's glaciers are retreating, with major implications for soil erosion and water flows, and consequent downstream impacts on water supplies for industry, agriculture and human consumption and for hydro power generation (see Kerr, 2006). For instance, in early May 2006 the Chinese Academy of Sciences reported that the 46,000 glac ers of the Tibetan plateau are currently retreating at an average rate of around 7% per annum (*The Independent*, 9 May 2006). As the melt-water from these glaciers diminishes, so too will the volume of water in most of the great rivers of Asia – the Yellow, the Yangtze, the Mekong, the Indus, the Ganges and the Brahmaputra. This has the potential to impact on the lives of hundreds of millions of people across Asia.

8. As parts of the globe warm, they are be ng afflicted by various pests and diseases. To give one example: the mountain pine beetle in British Columbia is causing the loss of valuable forests of lodge pole pines because newly hatched bugs are not being killed by the cold as was previously the case, enabling them to spread rapidly. Thus far, he mountain pine beetle has destroyed 22 million acres of for st – an area close to the size of the North Island – and within six years it is expected that 80% of the mature pines in British Columbia will have been destroyed, with a risk that similar damage will be done right across North Amer ca.

If all this is not worrying enough, the implications for the future are far worse (see Watson, et al, 2001). For instance, the sea-level is predicted to rise during the 21st century by as much as half a metre and this will be sufficient to inundate many low-lying delta regions in Bangladesh, India and China, and swamp a number of small, low-lying

[10] For instan e, the head of the Chinese Meteorological Administration, Qin Dahe, commented in mid August 2006 that: "Against the backdrop of global warming, more and more strong and unusual climatic and atmospheric events are taking place". He noted that the strength and destructiveness of typhoons is increasing and that they are traveling further than normal. To date this year, China has been hit by eight typhoons, with the first on 18 May (more than two months earlier than the usual start to the typhoon season). Typhoon Saomai, which struck Zhejiang and Fujian in mid August, was the strongest in half a century. See www.iol.co.za/general/news. The Chinese Ministry of Civil Affairs announced in mid August 2006 that natural disasters thus far in 2006 had "killed 2,006 people, affected more than 316 million others and caused economic losses of 160bn yuan (US$20bn)". See http://news.bbc.co.uk/2/hi/asia-pacific/5261918.stm

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island states. Perhaps the greatest worry, however, is that positive feedback effects will accelerate the process of warming, generating abrupt and unpredictable climatic changes. This, in turn, could have widespread impacts on global food production and water resources, generating not only mass migrations of people (and millions of environmental refugees), but also political instability and regional conflicts.

In fact, some of these political risks are already in evidence. In March 2006, for instance, the Ugandan authorities reduced substantially the outflow of water from Lake Victoria into the Nile (*Dominion Post*, 10 March 2006, B2). The reason, very simply, was the significant impact of the continuing drought in East Africa on the lake level. Many scientists, incidentally, attribute the severity of the drought at least partly to human-induced climate change. Understandably, Uganda's decision was not welcomed by the states further downstream, such as Egypt, that depend on the Nile for their water – for agriculture, energy and human consumption.

Aside from such considerations, there are other powerful reasons to be deeply concerned by the recent rapid increase in GHGs in the Earth's atmosphere. Arguably the most important is the fact that the world's oceans are absorbing close to 50% of the CO_2 released into the atmosphere as the result of fossil fuel emissions and other human activities (Turley, 2006). As the oceans absorb this CO_2, the upper layers are gradually acidifying (i.e. ocean pH is falling). According to recent scientific evidence, this process of acidification "has the potential to affect a wide range of marine biogeochemical and ecological processes" (Turley, et al. 2006, p 65; see also Henderson, 2006; McFarling, 2006; Schubert, et. al., 2006; Steffen, 2006). For instance, reduced pH is very likely to lower the calcification rates of calcifying organisms (such as corals), with consequent impacts on marine ecosystems. Research on such impacts is still in its infancy, but it is already recognized that the consequences of ocean acidification are potentially very severe, not least because of the rapid rate at which it is occurring. Indeed, some experts have argued that the risks to marine ecology are so great that they alone warrant urgent action to reduce global anthropogenic CO_2 emissions very rapidly – regardless of the strength of the arguments based on climate change considerations.

Avoiding Dangerous Climate Change

One of the many questions posed by the growing evidence of global warming is how much climate change is safe? To put it differently, how much harm to the planet – its ecosystems, biogeochemical processes, climate regulation, and its human inhabitants – is acceptable? Plainly, there is no simple, straight-forward answer to such questions, and any answer will entail value judgements and trade-offs of various kinds.

A helpful starting point is provided by the United Nations Framework Convention on Climate Change (UNFCCC), which has been ratified by virtually every country in the world. Under the Convention, the parties agreed to take

> precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are threats of irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures.

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Further, Article 2 states that the objective of the Convention is the "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system". It also suggests that:

> Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened, and to enable economic development to proceed in a sustainable manner.

Such wording raises a number of issues. For instance, what constitutes irreversible damage? And what timescale is relevant for the consideration of reversibility? Equally, what is meant by "dangerous anthropogenic interference with the climate system"? Dangerous to what or whom? Dangerous in what ways and over what timescale? The Convention, not surprisingly, does not define words like *dangerous*. During the past decade or so, there has been considerable debate in the international community over such matters, and the literature is now substantial (see Schneider and Lane, 2006). I cannot explore all the relevant issues and arguments here, but let me offer a few summary comments.

To the extent that climate change is already causing serious damage to ecosystems across the globe, such as coral reefs, forests and the habitats of Arctic animals like polar bears, it is already *dangerous* – in the sense of causing large-scale damage and destruction to living organisms. Similarly, to the extent that droughts and storms are becoming more severe as a result of climate change, then global warming is already dangerous for large numbers of peopl especially in sub-Saharan Africa and other parts of the globe. From this standpoint, there ore, "dange ous anthropogenic interference with the climate system" is occurring now; it is not something for the future. It might not seem very dangerous, of course, but this is merely because much of the suffering is unseen and unheard, far from the spotlight of Western media attention.

Against this, it could be argued that the current level of "dangerous anthropogenic interference" is modest, certainly compared with likely projections over the coming decades, and especial y the second half of the 21st century. On this score, it might be contended that we should define "dangerous" in terms of interference that is *very* dangerous – that is, where the scope and scale of the damage being inflicted on ecological and social systems is truly immense, and where millions of people die annually as a result of severe climate events (with many millions more negatively affected in significant ways).

But criteria of th s nature are inherently problematic: where exactly does one draw the line? What is the relevant threshold of damage, death and suffering? How many millions: two, five, ten? Any consideration of such issues suggests that there is no single, clear-cut threshold; rather we are faced with a continuum of damage (both in scope and scale), and a continuum in terms of risks, including risks of irreversible damage. This means that we probably need to think about d*angerous* in terms of degrees of danger or ranges of impacts, and not in terms of precise or fixed points. We also need to think about the full range of impacts – ecological, social, economic and political – as well as their magnitude and distribution (see Pachauri, 2005).

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At the same time, it is unlikely that climate change will occur in a smooth, gradual, linear fashion; rather, we can expect non-linear or abrupt changes, with consequent dramatic, or at least severe, impacts. Further, it is likely that the magnitude of the damage inflicted will increase sharply with each shift in the climate system, as the global mean temperature rises. Currently, there is considerable uncertainty within the scientific community as to where the relevant thresholds or triggers of abrupt climate change might be. However, the matter is the subject of much research, and as climate and Earth system modeling improves and as more data become available our understanding of climate dynamics will improve.

In the meantime, there has been support in various circles for the proposition that avoiding some of the most dangerous risks of climate change will require global mean temperature increases to be limited to about 2^0C above pre-industrial levels (or about 1.3 degrees above current levels). Indeed, the European Union has, after some debate decided that the provisions of Article 2 of the UNFCCC should be interpreted such that mean the temperature increase should not exceed this 2^0C target. There is no suggestion, of course, that keeping temperature increases below this target is 'safe' or that it will prevent significant negative impacts from occurring. Nor is there any reason to believe that an increase of, say, 2.2^0C will be catastrophic whereas an increase of only 2^0C will not. Nonetheless, there is good evidence that a global mean increase of, say, 3^0C would result in dramatic changes to the Earth's climate, and that an increase of anything approaching this magnitude should definitely be avoided, even if the short-to-medium term economic costs of doing so are relatively high (Barrett, 2006).

Let us suppose, for the sake of argument, that there is merit in seeking to avoid an increase in the global mean temperature of more than 2^0C. What would this mean in terms of stabilizing CO_2 and other GHG concentrations in the atmosphere? Further, what magnitude of reductions in global anthropogenic emissions would be required to achieve such a stabilization, how feasible are such reductions from a technical point of view, and what would be the likely economic cost of trying to achieve them? Again, there are no easy answers to such questions. Indeed, the issues are extremely complex. In brief, however, the following points can be made:

1. For stabilization to occur it will be necessary for global GHG emissions to equal the natural uptake of carbon from the atmosphere. Note, however, that the natural rate of uptake is at least partly influenced by human actions, such as deforestation, afforestation and other land-use changes. Deforestation is currently very rapid, thus reducing the natural uptake of carbon.

2. As previously noted, there are considerable lags in the Earth's climate system. Even if GHG emissions were reduced within the next few decades, CO_2 concentrations would take many decades to stabilize, the global mean surface temperature would continue to rise for a much longer time, and the sea level would continue rising for several thousand years (see Figure 1).

3. In broad terms, the more ambitious the stabilization target, the greater the reductions that will be required in GHG emissions during the 21st century; and the greater the reductions required, the higher the likely adjustment costs.

4. Much of the current literature suggests that in order to have a reasonable chance (e.g. at least a 50% chance) of staying below the 2^0C target it might

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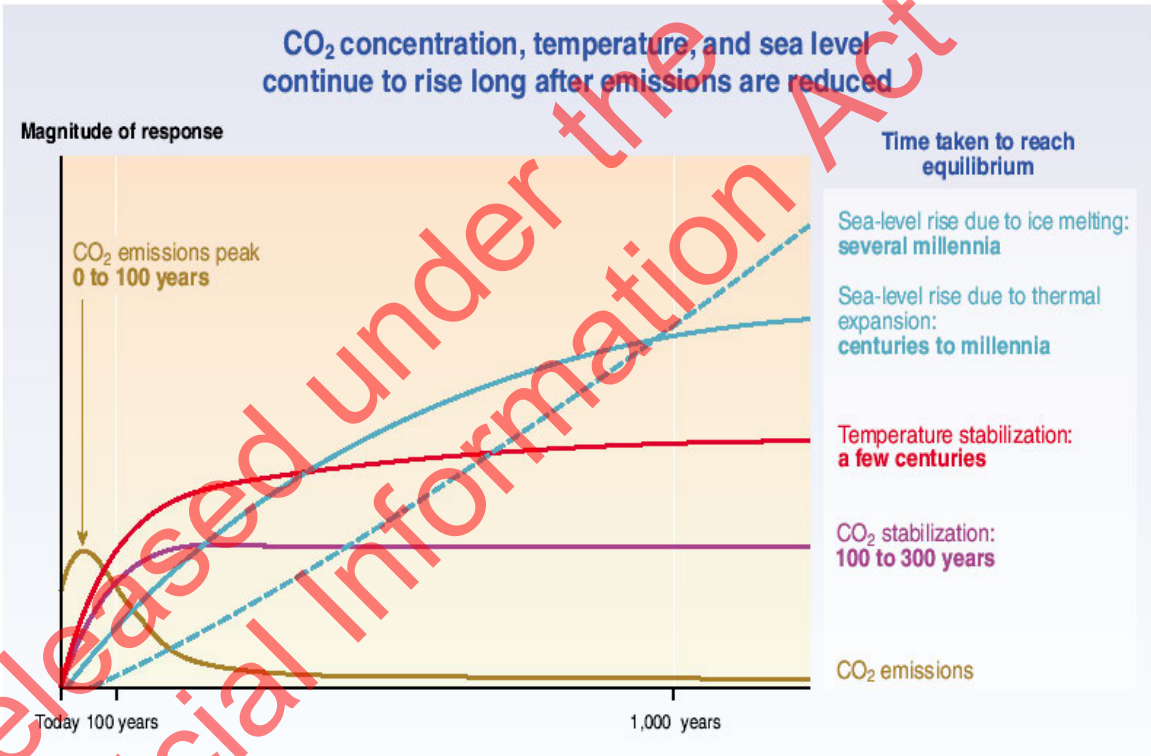
well be necessary to stabilize GHG concentrations at levels only slightly above current levels (Report of the International Scientific Steering Committee, 2005, p.7; see also Table 1). More specifically, it has been argued that concentrations of CO_2 may need to be stabilized at around 400ppm (or at about 450ppm CO_2 equivalent – i.e. taking all the main GHGs into account) (see Betz and van Vuuren, 2006, p.337). Meinhausen (2006, p.264) suggests an even lower stabilization level, arguing that: "Only at levels around 400ppm CO_2 equivalent or below, could the probability of staying below 2^0C in equilibrium be termed 'likely' for most of the climate sensitivity PDFs [probability density functions]". Bear in mind that 400ppm of CO_2 is only 20ppm above current levels and that we are already well over Meinhausen's suggested stabilization level of 400ppm CO_2 equivalent. Also, as noted earlier, concentrations of CO_2 are currently increasing annually at up to 2.5ppm.

Figure 1: Lags in the Climate System



Source: Watson, et al., 2001, p.17.

5. 'Stabilization' and 'peaking' are different concepts. Thus, stabilizing CO_2 concentrations at, say, 400ppm (or at about 450ppm CO^2 equivalent) assumes that CO_2 concentrations will peak at a higher level and then fall back to a more stable level. Nevertheless, the level of the peak, and the length of time near the peak are likely to be important (see Meinshausen, 2006).

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6. Relatively little analysis has thus far been undertaken on how the world community might achieve CO_2 stabilization levels as low as those suggested by Betz and van Vurren or Meinhausen, with most of the work of the IPCC (Watson, et al., 2001) and others having focused on stabilizing CO_2 concentrations at 450ppm, or much higher levels (e.g. 550ppm or 650ppm) (see Grubb, et al., 2006).

Table 1: Increase in global temperature for different stabilization levels

	Temperature change by 2100 (relative to pre-industrial)		Temperature change at equilibrium (relative to pre-industrial)	
Stabilization level (CO_2 equivalent)	Temperature change – based on IPCC 2001 climate models	Temperature change – based on 2004 Hadley Centre ensembles	Temperature change – based on IPCC 2001 climate models	Temperature change – based on 2004 Hadley Centre ensembles
400ppm	1.2-2.5^{0}C	1.6-2.8^{0}C	0.8-2.4^{0}C	1.3-2.8^{0}C
450ppm	1.3-2.7^{0}C	1.8-3.0^{0}C	1.0-3.1^{0}C	1.7-3.7^{0}C
550ppm	1.5-3.2^{0}C	2.2-3.6^{0}C	1.5-4.4^{0}C	2.4-5.3^{0}C

Source: Stern (2006a, p.3).

7. According to the IPCC's Third Assessment Report (Watson, et al., 2001, p.19), in order to achieve a stabilization target of 450ppm, global anthropogenic CO_2 emissions would need to fall below 1990 levels by around 2020, and continue to decrease steadily thereafter to a "very small fraction of current emissions". More specifically, in order to stabilize CO_2 concentrations at no more than 450ppm, it is likely to be necessary to achieve a 60% reduction in the cumulative emissions produced between 2000 and 2100. This translates into a cut of about 3000 $GtCO_2$ or around 4000 $GtCO_2$ equivalent. Put differently, by 2100 annual global emissions would need to be about 80% below current levels (Metz and van Vuuren, 2006, p.338). According to den Elzen and Meinshausen (2006), stabilization at only 400ppm (or 450ppm CO_2 equivalent) would require a reduction in cumulative emissions of 4500 $GtCO_2$ equivalent, which would imply a 90% cut in annual global emissions by 2100. Stabilization at a lower level, such as 400ppm CO_2 equivalent, would necessitate even l rger reductions. Emission cutbacks of this magnitude are, needless to say, extremely ambitious. To illustrate: stabilization of CO_2 concentrations at 550ppm (twice the pre-industrial level) would require "supplying carbon free energy in 2050 on a scale equivalent to the entire current supply of energy from fossil, nuclear and renewable primary resources" (Doornbosch and Upton, 2006, p.6). Stabilization at a lower level would imply an even bigger, and more rapid, switch to carbon-free energy sources, most notably solar, and far more efficient end-use. This could well entail the premature retirement of existing carbon-intensive capital stock.

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8. Another way of looking at the situation is to use carbon emissions, rather than CO_2 emissions. Currently, carbon emissions are around 7Gt per annum, and rising at about 2% per annum. Under a business-as-usual policy scenario (and assuming continuing world economic growth), total emissions between 2000 and 2100 are projected to be around 1,400GtC (Grubb, et al. 2006, p.7). In order to stabilize CO_2 concentrations at 550ppm, mean cumulative carbon emissions during this century would need to be capped at about 930GtC; a stabilization target of 500ppm implies a limit of about 780GtC; a stabilization target of 450ppm implies a limit of about 600GtC; while a stabilization target of 400ppm implies an even lower limit – probably under 400GtC. Given that emissions are likely to exceed 70GtC during 2000-2010, and over 80-90GtC during 2010-20, a huge reduction in carbon emissions will be necessary after 2020 to keep within a 400GtC cap.

9. Metz and van Vuuren (2006) have assessed the technical feasibility of achieving reductions designed to achieve a stabilization target of 500ppm CO_2 (or 550ppm CO_2 equivalent). Their conclusion is that such a target is:

> technically feasible with the technologies known today. However, it requires a very broad portfolio of policies and appropriate socio economic and political circumstances. Without these circumstances, the implementation and diffusions prospects of these technologies are highly uncertain … For all stabilization strategies, the biggest problem does not seem to be the technologies or the costs, but overcoming the many political, social and behavioural barriers to implementing mitigation options (pp.343-44).

10. There appears to be only limited research on the technical feasibility of achieving reductions designed to meet a stabilization target of 400ppm CO_2 (or 450ppm CO_2 equivalent), or less.[11] Whatever the technical feasibility, however, the main problems are likely to be the political, social and behavioural barriers – as argued above by Metz and van Vuuren.

11. Various estimates have been made of the likely costs of attempting to achieve stabilization targets of 500ppm CO_2 (or 550ppm CO_2 equivalent). According to Metz and van Vuuren (2006, p.344), "least-cost strategies are estimated to reduce global average GDP by 2050 by 1-4% for 550ppm CO_2-eq stabilization. Fo specific regions, countries or sectors costs could be higher". It is likely that the cost of achieving more ambitious (and 'safer') stabilization targets will be higher.

12. Ac ion to reduce GHG emissions does not imply lower standards of living relative to current levels, but rather *slightly* lower living standards in, say, 40-50 years than would otherwise have been the case (see Hatfield Dodds, 2006). This is a critical issue in relation to the politics of climate change mitigation. Equally, it must be remembered that a failure to act to reduce emissions may

[11] According to the head of the International Energy Agency (IEA), Claude Mandil, it may already be too late to prevent a 2^0C increase in global temperatures. Even the most ambitious scenarios for cutting GHG emissions thus far considered by the IEA fall short of preventing warming of this magnitude. See http://www.sciam.com/article.cfm?chanID=sa003&articleID=2548A4AC7AD6EDDD035BCED24EC6D964

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well result, at some point, in falling GDP – as the costs of the impacts of global warming begin to overwhelm the capacity of economies to cope.

13. There is some evidence to suggest that curbing GHG emissions will become all the more difficult and costly the longer that action is delayed. For instance, it has been estimated that if measures to mitigate climate change are delayed by 20 years, "rates of emission reduction may need to be 3 to 7 times greater to meet the same temperature target" (see Report of the International Scientific Steering Committee, 2005, p.7; see also The Allen Consulting Group, 2006).

14. Policy makers need to be mindful of the issues of path dependence and the lagged effect of corrective policy measures. Major infrastructure assets in areas like energy generation and transportation typically have a long economic life. For instance, coal-fired power stations recover their capital investment over about three decades and often operate for much longer than this. The more stations that are built over the coming decade, the more difficult and costly it will be to make the transition to a low-carbon economy (e.g. in terms of retrofitting these installations with more efficient technologies, introducing carbon capture and storage, or prematurely closing them down). Hence, the longer businesses and public sector organizations invest in carbon-intensive technologies and infrastructure, the more expensive the adjustment to a low-carbon economy will be. The fact that the world may be wealthier in three-to-four decades is largely irrelevant. Given the issues of path dependence, it makes sense to change the path we are on now, and not delay.

15. Avoiding irreversible damage to the oceans as a result of acidification may require even larger and more rapid reductions in carbon emissions. Currently the oceans are absorbing around 2 $GtCO_2$ per annum, as much as 20 times the natural or pre-industrial rate (Henderson, 2006, p.32). To return to the natural rate of around 0.1 $GtCO_2$, and thus prevent further significant acidification, will require very large emission reductions – perhaps in the order of 95%, and/or compensatory action to increase carbon sinks.

In sum, based on certain assumptions about climate sensitivity, the likely impacts of climate change and the current rate of ocean acidification, it appears that substantial reductions in both current and projected global GHG emissions will be needed to stand a reasonable chance of fulfilling the requirements of Article 2 of the UNFCCC and thus avoid "dangerous anthropogenic interference with the climate system". Even larger reductions may be necessary to prevent irreversible and large-scale damage to marine biogeochemical and ecological processes. Currently, global GHG emissions are rising. Given the large continuing investment in carbon-intensive plant and equipment in many parts of the world (not least China and India), emissions will continue to increase for many years to come. In fact, on a business-as-usual approach, emissions are expected to double within half a century. If this growth is to be halted and eventually reversed, there will need to be a radical change in the current pattern of economic development and a corresponding shift in industrial, domestic and infrastructural investment. Similarly, it will be critical to arrest the process of deforestation occurring in many parts of the world. How might these objectives be achieved, and is there any realistic hope that they will be?

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Policy Considerations

Global policy action to address climate change has, of course, already begun. Pivotal in this regard was the negotiation of the Kyoto Protocol in 1997 (under the UNFCCC). In accordance with the Protocol, developed countries agreed to cut their overall emissions of six GHGs by an average of 5.2% below 1990 levels during the first commitment period, 2008-2012. Legally binding targets were set for each developed country. The Protocol took effect on 16 February 2005. Thus far, it has been ratified by 164 countries – the only exceptions in the developed world are Australia and the United States. In many respects, Kyoto represents a remarkable achievement for the world community – particularly in terms of setting binding targets, developing compliance rules, encouraging the uptake of low-carbon technologies in the developing world, establishing a market for carbon and providing a foundation for securing agreement on deeper cuts in GHG emissions over the coming decades. Unfortunately in some circles Kyoto has become a term of abuse and derision.

Many countries have already gone beyond the short-to-medium term requirements of Kyoto and set ambitious, longer-term emission reduction targets. For instance, the United Kingdom has announced that it will endeavour to achieve reductions of 60% by 2050; the state of California has set itself an 80% target. More important, the European Union introduced an Emissions Trading System (ETS) in 2005. The ETS currently covers about 12,000 industrial facilities and power stations within the European Union which, collectively, account for nearly half the Union's carbon emissions. Under the ETS, companies can buy and sell carbon allowances (within a fixed cap), with the price governed by supply and demand as in any other market. There have been a range of problems with the ETS, as might be expected with the trading of a 'new' commodity. The key benefit of the scheme is that it has established a price (and cap) for carbon: this not only provides an incentive for companies to restrain their carbon emissions, but does so in a manner that achieves emission reductions in a least-cost manner. Furthermore, placing a price on carbon gives companies more certainty about the future as they assess their investment options. This, incidentally, is critical to the logic underpinning the Kyoto Protocol.

To date, New Zealand has had less success than the European Union with the development and implementation of emission reduction policies. In fact, climate change policy has been characterised by lengthy and inconclusive debates, a lack of consensus amongst key stakeholders, governmental indecision and prevarication, and a series of significant policy reversals (see Ward, 2006a). Under Kyoto, New Zealand accepted binding targets to reduce GHG emissions to the 1990 baseline during the first commitment period (2008-2012). Unfortunately, the country is a long way from meeting these targets. Gross emissions (before accounting for forest sinks) have continued to increase and are currently about 21% above the 1990 baseline. Indeed, emissions of CO_2 equivalent are expected to be around 30% higher than 1990 levels during the first commitment period, largely because of increased CO_2 emissions from transport, rising methane emissions (as a result of a growth in the number of ruminant livestock), and a substantial rise in nitrous oxide emissions (largely from dairy effluent, dung and urine deposits, and fertilizer usage) (see Clark, 2006; Whitehead, 2006b). Declining forest planting rates are exacerbating the situation. As a result, net emissions are currently projected to be around 12% (or about 41 million emission units) over 1990 levels during

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2008-12, even after offsets from forest sinks are included.[12] This is likely to entail fiscal costs (via the purchase of carbon credits from other countries or firms) – i.e. unless the then government elects not to meet its international treaty obligations.

For various reasons, reducing emissions is likely to be more difficult in New Zealand than in some other developed countries. For example, New Zealand already produces around 60% of its electricity from renewable sources, one of the highest percentages in the world. Also, almost 50% of GHG emissions are generated in the agricultural sector, and there are few quick 'technological' fixes currently available in this area. There are, however, some options available, such as reducing the use of fertilizer, turning marginal agricultural land back to shrubland and/or forest, and replacing some livestock farming with 'carbon farming' (e.g. the growing of crops for biofuels).

Fundamentally, however, such changes are unlikely to achieve the large-scale emission reductions that appear to be necessary as part of a global effort to prevent dangerous climate change. Moreover, they will not happen at all without a significant change in financial incentives (see Ward, 2006b). In short, unless the price of carbon is built into the decisions of investors, producers and consumers, economic behaviour cannot be expected to change – or at least it will not change very much. Also, without a change in the price structure, there will not be the incentive to develop and introduce the new technologies that will be required to achieve low carbon economy.

Pricing carbon is thus an essential prerequisite, in my view, for an effective, least-cost strategy to reduce GHG emissions. Arguments that prices don't matter or that an economic transformation of the kind required can be achieved without using the price mechanism are simply not credible. In roducing a price for carbon can be achieved through a variety of economic instruments, includ ng taxes or the trading of emissions based on the allocation of property rights (as under the ETS). Both options have well-recognised advantages and disadvantages which do not need to be rehearsed here.

Tradeable Personal Carbon Allowances

In relation trading schemes, the British Environment Secretary, Rt Hon David Miliband, has recently suggested that the principle of carbon trading should be extended beyond heavy polluters such as power companies, to consumers.[13] Under his proposal, individuals would be allocated annual tradeable personal carbon allowances (or quotas). Heavy carbon users who exceed their allocation would be forced to buy unused allowances from people with a much smaller carbon footprint. Miliband argues the case for such a policy as follows:

> if ndividuals are to make a major impact on their carbon footprint, they need to focus on a few major changes. For instance, the average household is directly responsible for about 10 tonnes of $C0_2$ per year. If they did four major things, they would be able to reduce their carbon footprint by nearly a third. Changing to

[12] For the most recent data on New Zealand's Greenhouse Gas Inventory, see: http://www.climatechange.govt.nz/resources/reports/nir-apr06/html/page2.html
For projections for the first commitment period, see the 2006 'net position' report: http://www.climatechange.govt.nz/resources/reports/projected-balance-emissions-jun06/html/index.html

[13] The idea was apparently originally proposed by Dr David Fleming, a London-based policy analyst (see Starkey and Anderson, 2005, p.2).

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> a hybrid car, installing cavity wall insulation, fitting a wind turbine and solar panels can save over 3 tonnes of carbon for each household. Each of these investments offer financial returns for the consumer through lower energy bills, and well as environmental returns for society. …
>
> Imagine a country where carbon becomes a new currency. We carry bank cards that store both pounds and carbon points. When we buy electricity, gas and fuel, we use our carbon points, as well as pounds. To help reduce carbon emissions, the Government would set limits on the amount of carbon that could be used.
>
> Imagine your neighbourhood. Each neighbour receives the same free entitlement to a certain number of carbon points. The family next door has an SUV and realise they are going to have to buy more carbon points. So instead they decide to trade in the SUV for a hybrid car. They save 2.2 tonnes of carbon each year. They then sell their carbon points back to the bank and share the dividends of environmental growth.
>
> The granny next door doesn't drive and doesn't do much air travel. So she has spare carbon points that she can sell. But she doesn't want to be handling two currencies so she cashes in all her carbon permits as soon as she receives them. When she pays her electricity bill, her energy company builds in the price of carbon to her total bill. She simply pays for carbon as she uses it. At the end of the year she finds herself better off.

Miliband suggests a number of reasons why serious attention should be given to the idea of tradeable personal carbon allowances. First, financial incentives help align self interest with the public interest. If individuals realize that points will be deducted from their swipe card every time they purchase particular items, they will alter their purchasing decisions in a way that will help the environment. Second, such an approach respects individual liberty and minimizes the use of state coercion and paternalism. Indeed, compared to many other policy instruments, the use of tradeable allowances is relatively empowering. Third, granting individuals carbon allowances will help focus their attention on the wider implications of their decisions, and have a real impact on their behaviours, attitudes and preferences. Fourth, such an approach changes the burden from "having to opt in to sustainable behaviour to having to opt out … Instead of being given the option of opting into a scheme that offsets your carbon impact, you could be given the option o opting out". Fifth, unlike (higher) indirect taxes which increase the price that all consumers must pay for certain products, "personal carbon allowances provide free entitlements and only offer financial penalties for those who go above their entitlement". And those who are most likely to exceed their limit are typically the more affluent members of the community. Sixth, using financial incentives is compatible with the application of other policy instruments, such as better consumer information, subsidies for particular technologies or products, regulations prohibiting certain kinds of behaviour, and so forth.

Such arguments, in my view, have merit. Furthermore, if a government were to propose tradeable personal carbon allowances as a serious option it would certainly focus public attention on the relationship between climate change and lifestyle choices – perhaps in a way that no other policy instrument could achieve. Having said this, the idea is not

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without rather obvious difficulties and objections, as Miliband readily acknowledges (see Starkey and Anderson, 2005). In brief, these can be summarized as follows:

1. The idea is bound to be highly controversial politically, and might run the risk of undermining public support for initiatives to address climate change;
2. As with the European Union ETS, the early phase of any regime involving tradeable personal carbon allowances is bound to generate uncertainty and potentially significant fluctuations in the price for each tradeable carbon unit;
3. The introduction of carbon allowances using individuals as the unit of analysis would involve significant administrative costs;
4. The use of electronic cards to record carbon usage (and facilitate trading) may provoke opposition from those concerned to protect individual privacy;
5. There is bound to be disagreement over the annual aggregate cap on carbon emissions and thus the quantum of allowances allocated to each individual. Attempts to impose major cuts in allowances over time are likely to be vigorously opposed, because more and more individuals would find it necessary to purchase additional allowances, thus driving the price of carbon units higher;
6. Using individuals as the basis for distributing carbon allowances is likely to generate various equity issues (e.g. a family of four would presumably be allocated four times the quantum of carbon allowances as single person, yet both 'units' may require a separate home and a car). Whatever the unit of analysis, however, equity issues are bound to arise; and
7. There would potentially be problems of 'leakage'. For instance, self-employed people might be able to make purchases via their businesses over and above their individual carbon allowances – although this would depend on the carbon regime under which firms were required to operate.

I am in two mind about Miliband's idea. It has very obvious attractions; but equally it has certain drawbacks. If nothing else, it deserves a fair hearing and proper public debate. In New Zealand an important issue would be what products to include within such a scheme, and in particular whether agricultural products would be covered. If they were, consumers would quickly discover that the production of one kilo of butter generates about five times as much carbon as an equivalent amount of margarine. It would be interesting, to say the least, to see what the impact of this might be on consumer behaviour!

The Way Forward

New Zealand needs to play its part as a good international citizen. There is no case for free riding. It would not only be morally irresponsible but also economically risky, as the Secretary to the Treasury has highlighted (see Whitehead, 2006a). In policy terms, action both to adapt to and mitigate climate change is required at all levels of government – local, regional and national. Such policies need to properly integrated, as well as durable and cost-effective. Key steps at the national level could include:[14]

[14] There is an extensive and rapidly growing literature on climate change policy issues. See, for instance, Congressional Budget Office (2002), Helm (2005) and Schneider et al. (2002). For recent contributions to the New Zealand policy debate see: Chapman (2006), New Zealand Government (2005), Upton (2006) and Ward (2006b).

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- Establishing an authoritative independent advisory board to advise the government on the scientific and policy issues surrounding climate change;
- Setting a long-term domestic target for GHG emission reductions (e.g. a 60-80% reduction by 2050, with appropriate modeling and milestones);
- Establishing comprehensive price-based mechanisms to ensure that the (social) cost of carbon is built into the decision making of investors, producers and consumers. Any economic instruments must ultimately include agriculture in some way;
- Encouraging individuals, households, firms and organizations (including churches, government agencies, schools, tertiary institutions, DHBs, etc.) to become carbon neutral;
- Providing incentives to expand carbon sinks;
- Investing more heavily in research and development, especially in relation to renewable energy technologies, carbon capture and storage, and agricultural emissions;
- Establishing a major centre of research excellence (CORE) on climate change within the university sector, in association with the relevant Crown Research Institutes;
- Encouraging the development of low-carbon transport modes, including public transport;
- Expanding the proportion of electricity generated from renewable sources, including wind, solar, hydro, geothermal and marine (wave, currents and tidal); and
- Vigorous diplomatic action to build a global consensus on post-2012 arrangements (i.e. following the first commitment period under Kyoto).

Advancing a policy agenda of this nature will require a concerted effort to inform the public about climate science and the impacts of climate change, including ocean acidification. Such efforts need to include appropriate, authoritative information on the likely consequences of a business-as-usual approach and the risks – economic, social, political and ecological – of inaction or inadequate (or ill-conceived) action. It will also require the building of a cross party consensus on the importance and urgency of climate change mitigation and adaptation. The release during 2007 of the Fourth Assessment Report of the IPCC will provide an ideal opportunity to commence a major publicity campaign.[15]

At the global level, concerted action will be required on many fronts. There is not the space to deal with such issues in depth in this paper. But plainly it will be imperative to ensure that the second commitment period under the Kyoto Protocol includes strenuous and efficacious measures to halt the rise in global GHG emissions and eventually put them on a downward track. Action to address deforestation, rebuild the world's long-term carbon sinks and ensure effective carbon-cycle management will also be essential (see Read, 2006). Achieving agreement on the necessary measures will be an immense challenge. Implementing any agreement will also present formidable hurdles. One of these will be to minimize free riding. As Stern (2006a, p.10) has argued:

[15] It is vitally important that information on climate change and its impacts is provided to the public in a manner that will empower individuals and organizations to take appropriate action rather than leaving them with a sense of utter despair. See, for instance, Ereaut and Segnit (2006).

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The sustainability of agreements will be crucial, given the potential damage that free riding can inflict on mitigation by others. A combination of methods is likely to be appropriate, including: international standards; treaty obligations supported by emissions quotas and/or taxes; technological lock-ins through infrastructure and other investments; placing climate change at the centre of a whole set of international engagements; public pressure, nationally and internationally; and the education of current and future generations.

It is worth noting, in this context, that the distinguished economist and Nobel laureate, Joseph Stiglitz (2006) has recently suggested using the mechanisms of the World Trade Organization to enforce compliance with GHG emission reductions. Under his proposals, countries which subsidize the production of GHG-intensive goods and services would be penalized. It remains to be seen whether there will be much support for such suggestions, but it would certainly provide a potentially effective way of enforcing compliance with globally-agreed GHG reduction targets.

Conclusion

In my view, it is unquestionably in the public interest for firm and effective global action to be taken urgently to reduce GHG emissions and thus minimize the risk of "dangerous anthropogenic interference with the climate system". While I am hopeful that the world community can rise to the challenge, I am by no means confident. The political, social and behavioural barriers to change should not be underestimated. Nor should we ignore the issues of path dependence and the long adjustment lags associated with an orderly shift to a low-carbon economy.

Unless there is an imminent threat of potentially irreversible and very damaging changes to the Earth's climate, there is a significant risk that efforts to build an international consensus on the need for rapid GHG emission reductions will falter, derailed by short-sightedness, narrow perceptions of national self-interest and powerful sectional lobbies. Maybe, as parts of the Amazon basin enter their second year of serious drought – and the risk increases that the world's major carbon sink will become a colossal carbon source – such a threat is very close at hand.

In the meantime, we all face similar ethical challenges: will we be able to look our grandchildren in the eye and tell them that, although we heard and read the warnings of the scientific community, we deliberately chose to ignore or disbelieve them – thus committing many future generations to a vastly altered climate and a much less conducive environment in which to live and move and have their being? Equally, we must ask: what is the Earth for? Is it there for us to pollute, plunder and damage irrevocably, or is it a wonderful gift – to be treasured, protected and enjoyed by all in perpetuity?

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Out of Scope

From: Todd Krieble <Todd.Krieble@dpmc.govt.nz>
Sent: Wednesday, 13 December 2006 4:59 pm
To: Suzanne Doig
Subject: Initiatives for ET, NI and Global Credibility
Attachments: Initiatives for ET, NI and Global Credibility.doc

Suzanne,

I'll circulate to Ken (MAF and CC), Rosemary (Energy, tax etc), and Wayne (Transport)

We are yet to hear from:

MOT
TIA
MED
MORST
Tourism NZ
??

Todd Krieble
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Department of the Prime Minister and Cabinet Executive Wing Parliament Buildings Wellington

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20-D-02335 Appendix 1: document 6.1

20-D-02335 Excerpt of in-scope material

Document no.	Date	Title	In scope material	Context
6.1	13 December 2006	Document. Initiatives for ET NI and Global Credibility.	See below	Related material: see document 5.

Table heading: **Initiatives to Promote Sustainability as Part of National Identity**

Carbon Credit Cards	New Zealand's EFTPOS technology would make it relatively easy to record carbon related transactions against a 'personal allowance'. This could be a voluntary scheme in which people are encouraged to make low carbon choices and voluntary offsets. The idea has been floated in the UK. Individuals are responsible for 40-50% of emissions	new

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Out of Scope

From: Gary Taylor s 9(2)(a)
Sent: Thursday, 8 March 2007 4:41 pm
To: David.parker@ministers.govt.nz; nick.smith@parliament.govt.nz; Jeanette Fitzsimons; 'Peter Neilson'
Cc: debbie.thornton@parliament.govt.nz; s 9(2)(a) ; helen.culver@parliament.govt.nz; s 9(2)(a)
Subject: EDS Auckland Climate Change Seminar transcript
Attachments: EDS Climate Seminar_Transcript.doc

Hon David Parker
Hon Nick Smith
Jeanette Fitzsimons
Peter Neilson

As promised, I have attached a transcript of the Auckland seminar for your information. Please let me have any corrections.

Kind regards
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20-D-02335 Appendix 1: document 7.1

Environmental Defence Society
Transcript of Climate Change Seminar
held at the offices of Bell Gully
Auckland 23 February 2007
www.eds.org.nz

Gary Taylor (Moderator)
Hon David Parker
Hon Nick Smith
Jeanette Fitzsimons
Peter Neilson

Opening remarks on behalf of Bell Gully

I would like to welcome Gary Taylor who's the Chair as you know of the Environmental Defence Society and I'd like to welcome our speakers this evening, the Honourable David Parker, the Honourable Nick Smith, Jeannette Fitzsimons and Peter Neilson. Thank you very much for being with us and Gary Taylor will introduce you more fully to the audience.

Bell Gully is very proud of its association with EDS, we've hosted seminars here before, sometimes the air conditioning hasn't been quite up to scratch so we'll check that during the course of the evening. I can see that it's hardly surprising given climate change as the subject matter. However, without further ado as there's a lot to get through tonight I'll hand over to Gary Taylor to introduce the speakers.

GARY TAYLOR
Thanks very much Simon and I must say I'm very grateful to Bell Gully for hosting this and for your continuing support for EDS, not least your support for one of our forthcoming conferences, *Beyond the RMA* which is being held at the end of May, if I can just give a quick advert for that and you've got the conference registration brochures hot off the press on your seats.

We thought it would be useful rather than just have the usual seminar thing where we have talking heads in a row and questions at the end, if we did what we tried at the second *Australia New Zealand Climate Change and Business Conference* in Adelaide in February last year which was to have a moderated discussion amongst leaders and so tonight we're going to try that. I've got a series of talking points that we pre-circulated so the participants have had some opportunity to think about their responses.

What we'll do is for the first half of the evening we'll have that conversation amongst the participants up the front. In the second half we'll open it up to the audience and if you've got questions or points that you'd like to make please start thinking about them now and

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in particular think about short versions of them because climate change is a very big topic as we all know.

The second advertisement I need to give is the Environmental Defence Society's third *Australia-New Zealand Climate Change and Business Conference* which is being held in late August in Brisbane and we're very pleased to be partnered in that exercise with a number of organisations including Peter, your New Zealand Business Council for Sustainable Development. The information about that conference will be put up on the screen behind me either now or shortly.

The other little housekeeping thing is at the end of the evening, when we are all totally exhausted, Bell Gully have kindly agreed to put on some more drinks and nibbles so we can enjoy some more of their hospitality.

Now as Simon said I'm very pleased indeed to have what I regard as many, if not all of the key players at political and business leadership level on this climate change matter here tonight. We've seen a lot of dialogue, a lot of media, we've seen the fourth assessment reports start to come out around the science that's firming but still in some respects uncertain and we're getting closer and closer to the first Kyoto commitment period which starts on 1 January next year.

I think in both Australia and New Zealand there's been quite a telling upsurge of interest in climate change amongst the general public, interest and concern and I was very interested as someone that's been involved in environmental advocacy for more than 30 years now to see in the latest Herald Digipoll analysis of important issues for New Zealanders, environment is up there at number four or five and climate change is an issue that people are concerned about so it's firmly on the radar screen.

What I'd like to do is kick off and ask our panel whether they agree that climate change is the biggest issue facing the planet today or whether that's over stating the case and I'd like to start perhaps by asking Peter who represents business to do that and Peter it might be useful if when you do this if you could just tell us what range of businesses the Business Council in fact represents.

PETER NEILSON
Okay. Thank you very much for the opportunity to come here. The Business Council for Sustainable Development has 56 members, disproportionately the large multi-national enterprises like Toyota, Honda, BMW, Westpac, Hong Kong Shanghai Bank as well as a number of New Zealand businesses which are inherently built around sustainable principles of their operating model. People like Interface New Zealand who make effectively floor coverings out of recycled material and try and lease them rather than sell them as a product because basically they want to maintain them and keep them going for a long period of time and people like Living Earth who've actually made a business successfully out of recycled material turning it into fertiliser. So what we have is a large number of businesses which have an international positioning which says sustainability is where the public's attitudes are, if we want to survive long-term that's where we want to

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be. Its an aspiration, they wouldn't say that they are perfect but that's where they're going and a number of organisations which have basically said this is how we want to operate. In terms of whether climate change the biggest issue on the planet, I'd probably say no but I'd say it certainly is the biggest international environmental issue and more correctly, probably the international environmental issue that we can actually do something about because some of the issues are very, very hard but more practical than this particular one. So that would be my attitude on that.

JEANETTE FITZSIMONS
Thank you Gary, speaking on behalf of the Green Party I guess, I think apart from thermo nuclear war which probably still outstrips it in terms of the scale of damage that would be caused, climate change is the most serious environmental threat and the difference is that nuclear war might still be totally prevented whereas climate change can't be. We know it's coming, we have to deal with at least some level of it and if we don't act then the level of it will make the planet basically unliveable.

NICK SMITH
Well National is probably somewhere where Peter is and that is it's the biggest global environmental issue. There may be other threats of a non-environmental nature. I'm still one of those that is the optimist about the capacity of humankind to develop technology such that we can have a future with high standards of living as well as one that is not adversely affecting the global climate systems albeit my view is that the complications of the issue of climate change in that carbon based fuels are so much an integral part of industrial economies and that the issue is so much a global issue. Certainly makes it one of the toughest political issues that I think will dominate political debate for the best part of the next 50 years.

DAVID PARKER
Yes I think it is but to a certain extent it is but a de facto system of pressure on resources caused by population.

GARY TAYLOR
Can I ask the panel if they agree that carbon neutrality is a useful aspirational goal for New Zealand?

NICK SMITH
I'm somewhat cynical of the goal of carbon neutrality for this reason. If we look around the world at the different countries that have been setting goals around what we might do about climate change, you know we have countries like the United Kingdom setting a goal of -60% by 2050. We've got Mr Schwarzenegger in California at -80% by 2050, Australia, New South Wales -60% by 2050. If we look at the UK, France, all of those countries have set goals of that sort of order and they've set a date. In my view the goal of carbon neutrality without any date applied to it, for a country that has emissions growing faster than any other OECD country, just makes us look stupid.

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Now I'm in the Al Gore camp. When he said its very easy for politicians to make promises about what might happen a long, long way off but actually we need some responsibility for what's occurring now and the decisions that we make over the next five-ten years and for instance for the Prime Minister to be pro promoting carbon neutrality in the very month in which we are commissioning E3P, the second biggest thermal power station that will put half a million tons of additional CO^2 into the atmosphere for each of the next 40 years is somewhat hypocritical. What National would prefer would be that we have a set of realistic goals. It's simply not credible for New Zealand to be talking of carbon neutrality when our emissions are growing faster than almost any other country.

GARY TAYLOR
Can you tell us what sorts of goals, are they specific goals?

NICK SMITH
Well I think the Stern Report actually provided a pretty good scientific basis. What the Stern Report said that a 50% reduction in emissions by 2050 would avert dangerous climate change and I think that would be a more meaningful long-term goal but I also have to say Gary that then pegging that back to where you think New Zealand should be in 2012, 2015, 2018, 2020 is actually going to be more accountable for the decision-makers of today that follows a track that would get us to that -50 by 2050 would be a better stake than simply amorphous goal of carbon neutrality with no date.

JEANETTE FITZSIMONS
I think the one thing the Prime Minister's goal has done is kind of alert us to the issues, it's made headlines, it's alerted the public to the fact that this is an issue. There's a huge difference between making a particular activity or enterprise carbon neutral which you can set out to do, and making a nation carbon neutral, and not many people understand what it means. I mean we are not going to be anywhere near reducing our emissions to 1990 levels in net terms by 2012 and yet carbon neutral means reducing those net emissions to zero and it's relatively easy at the moment for one enterprise to say we are going to plant enough trees to offset all our fossil fuel use because at the moment there's quite a lot of marginal country that's not very expensive where you can re-forest at relatively low cost. I mean the Greens are doing that out of our own pockets with our airline emissions because we have no choice but to fly but once the whole country starts trying to offset all of its carbon emissions with plantings you soon find that you just don't have the land to do it so I agree with the Prime Minister to the extent that having a big bold audacious goal out there is a good PR thing to do but I actually agree with Nick that what will drive change, what is most important is having some shorter term benchmarks or interim goals on the way against which to measure ourselves. That's why it's really important that the New Zealand energy strategy and energy efficiency and conservation strategies set targets within a realistic timeframe. Carbon neutrality will not happen in my lifetime for New Zealand inc.

GARY TAYLOR
Minister, numerative targets are better than narrative ones, or do you need both?

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DAVID PARKER
You do have to have an aspiration for change, you have to have something for people to aim for and we do know that there are companies and individuals who do want to aspire to carbon neutrality and the world is but the sum of individual actions so I very much believe that it's appropriate to have aspirations and goals. Who knows what will be the end point of the charge to eventual carbon neutrality. Maybe the last 20% of our carbon emissions or 50% of the carbon emissions including your agricultural emissions gets dealt with by improvements in agricultural technology and by eradicating our conservation estate from possums so that we have enormous carbon sequestration of our native forests. These things are not impossible and we should have these goals, but I also agree with Nick that it is important to have realistic achievable intermediate steps along the way and that is what I think the New Zealand Energy Strategy does in respect of one important sector. That's probably enough from me on that.

GARY TAYLOR
And Peter Neilson, business of course is looking for certainty and number targets are better than narrative ones for business I would have thought.

PETER NEILSON
I think in terms of the certainty that business wants they're probably more interested in political certainty, that there's a shared aspiration and the policies have got to follow behind. I don't think anybody knows what the answer is about exactly that will be. I think the thing that's impressed me recently is basically the number of people and organisations that have actually said they want to do something.

Our own polling indicates that despite the debate about Kyoto which actually confuses and angers people because they see confl cting heads often played as equal whether you agree or disagree on the subject and what's coming through quite strongly are people saying I now agree there's an issue its an urgent thing that we have to do something about. Please tell me, either as a business or as an individual what I can actually do to make a difference and that's where I think the debate is moving so the aspirational goal is useful but of course we won't get there unless we do have the list of what I can do and breaking that down to sectors and industry and individual organisations and individual households so I think the aspiration is desirable.

When I was an economist I always got told that when you were doing forecasting tell people a level or a number but don't give them a date or give them a date but don't give them a level because then you're accountable. But we've got to start off with the aspiration and then build back from that in terms of saying well it's possible and the other thing I think is that if you take a three year view which is one put between the political dilemma, most things are impossible. Take a 60 year view, most things are possible and it's really a matter of finding out where the balance is between those two things.

GARY TAYLOR

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Why don't we go on to the opportunities for business arising out of climate change as a driver for reducing emissions, Peter. Would you just like to tell us what the Business Council's view is on that and the extent to which business can provide the solutions to the problem that we face.

PETER NEILSON
At a very simple level basically most of the climate change impacts are really about how we use energy. There is the animal problem but it's really a matter of how we use energy to a great degree. Every time we reduce energy we reduce cost to a business so most businesses have at least some incentive to do something about climate change but often there's a disconnect between what you can do and how fast you can do it. One of those issues is simply the age of capital. The fact that we don't replace everything we've currently got even if we've got a better idea immediately. We wait until that has been run down or no longer needs to be used and has to be replaced and then we make the decisions. So that's one of the reasons why the long term signals are so important

We've got to get people making sure they don't invest long term in things which basically are not viable in the world. We've got to pay a price for carbon. So that's one of the reasons why there is the concern about the stability of the environment, but just think of the things and we will never envisage all of the things that might be possible.

If you think about what's happening at the moment - people in Marlborough have found a way of using algae to basically live in sewerage ponds to actually produce something they can be used as a biofuel. I don't know how big potentially that's going to be but most of the world has got a problem with sewage ponds that are basically too hard to clean up and too difficult to deal with. We may have got a technology that can deal with that. We know that for example within the sheep population and the cow population there's a huge variety in the amount of methane that those animals release which relates to the microbes and the rumen, basically what the food stock etc is. If we find a solution to that, if we can crack that, get intellectual property on it, our own dairy industry is a minute proportion of the total world's market. We happen to be important in traded international commodities for dairy but in terms of the dairy industry world wide that is a potential difference that would make a significant change. So those are two examples and we can keep on talking about more and more of them and that's just simply what we know is potentially there at the moment but many of those things will not happen unless people know that there is going to be a price on carbon because basically the problem you're avoiding has to be paid for and its only if you know that the alternative is going to be cheaper do you actually make those moves and so therefore when the European price for carbon collapses into Euro and people say do the politicians have the gumption to actually say no when they pass our emissions for trading, are they prepared to actually live with the consequences because Nick's right, passing resolutions now about how your successor in 50 years time is going to reduce it by 60% it's really that transition path which is crucial and the credibility that effectively no matter who the government is, that is roughly going to be the pathway we're going on. The methods, the mechanisms may be slightly different but we're still committed to that pathway.

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GARY TAYLOR
Nick, the uptake of technology depends a lot on government policy settings doesn't it, and aren't we in a position where we need to adrenalise technology uptake?

NICK SMITH
It's National's view that there's a suite of soft policy options and there are some useful things: I see the Aussies have just brought in this idea of compulsory energy efficiency light bulbs and there's a few things like that that will make a difference but really to get Peter's business sector focused on doing the biz around climate change it's National's view that we need to move down the road of tradable emissions systems. We see that as the biggest primary driver of policy.

If we look for instance at the experience in the US with sulphur dioxide and th acid rain issue, the economics of it are fascinating. When the government tried to regulate the industry to reduce their pollutants, they screamed blue murder. They had all sorts of accountancy firms writing dire reports on how much it was going to cost. When they actually created a market for it business got incredibly innovative, it was able to be transferred into their balance sheet and the price actually was amazing how quickly it dropped off because they did find the technologies and that's why National says the single most important piece of work that we need to advance in New Zealand is developing the rules around which an emissions trading system would work.

Now National makes no pretence tha there are some big challenging difficulties around how you put it together, which sectors do you include? Do you include agriculture with all its difficulties? Do you bring in for instance, th energy sector, the transport sector and the industrials? What effect will that have on international competitiveness? How will you allocate the initial credits? Will it be a grandfather arrangement or will it be arrangements where there is some tendering or other process? National accepts that all of those things are difficult but we think if you look at where things are heading internationally, where the Howard Government in Australia is going, where discussions in the US are going, the smart money is on emissions trading and the sooner New Zealand starts developing the work around that, the sooner we're going to get sort of business incentives that Peter speaks of for the innovators to actually develop the technology that will a ma erial difference to achieving those sorts of goals of -50 by 2050.

GARY TAYLOR
Jeannette, emissions trading?

JEANETTE FITZSIMONS
Kyoto is a cap and trade system between nations. That's what we're signed up to so we are part of a cap and trade system now. The question really is how does Government pass through those obligations to other players in the economy. This debate actually was very live in the mid 90s when Simon Upton commissioned a group to do a report on whether a carbon charge or an emissions trading scheme would be a better way of meeting the

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obligations. We hadn't even yet signed up to under Kyoto. My view at the time was cap and trade gives you certainty about the level of emissions but uncertainty about the price of carbon. The carbon charge gives you uncertainty about the outcome but certainty about the price of carbon and I felt at the time that the most important thing if you wanted to encourage business investment was some certainty around the price of carbon and I backed a carbon charge at that stage.

My concern in an emissions trading system that devolves it right down to very fine grained levels of the economy, even individuals or small firms, is the complexity of it is going to take at least five years to get it set up and running. I have no doubt that there are people out there now who are advocating carbon trading are doing it because they know it means nothing will happen for five years. People who thought that the political fight over the fart tax was difficult will find that that is kindergarten compared with the political fight that would erupt over how you allocate the permit because if yo grandfather them as was done in Europe then you lock the economy into old technology and you stifle innovation because you've made a great wealth transfer to all the current emitters and new people have to pay to get in. If you auction them you put quite a lot of businesses out of business immediately because they can't afford to pay the full price of carbon on everything they do, so presumably you would end up with a composite system with some grandfathered and some auctioned and it would be a poli ical decision as how much of each and which sections of the economy you protect and I think it would be a political nightmare.

There is another way of doing it which I support and which I think could move us towards emission trading but only at the level of the largest players in the economy initially and that would be to require all the fossil fuel industries who bring fossil fuel into the economy for the first time, that's those who mine it or those who import it, to purchase credits on the international market and remit those to government in order to cover the full emissions of the fuel that they sell. If you did it that way, government doesn't have to make this difficult political allocation decision, it follows through in a price. Those big players can easily manage that kind of trading and government would then end up rather than the taxpayer being in a big deficit situation in 2012 where we out of our pockets have got to come up with somewhere between $600m and a billion or so to cover New Zealand's exposure under Kyoto, government ends up with a surplus and it can use that surplus to mi igate the effects on individuals and business of the higher energy prices that result so that we all end up with more expensive energy but lower bills because we're using it a whole lot more efficiently or we're getting more renewables into place. So I think a concept like that would work really well and a lot faster.

GARY TAYLOR
Is it a transitional measure or is it the ultimate policy mix?

JEANETTE FITZSIMONS
I see it as a starting point for at least the whole of KP1 but that then sets a framework which is capable of working, of moving into a more complex carbon trading system after that. I know there are people who say let's give every individual in New Zealand their

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own carbon credit card which they've got to swipe every time they buy fuel or something else. They've got their own allocation of permits and all of us trade. That would be a wonderful system for somebody like me that knows how to use it and has always thought about reducing my carbon footprint. It would be a disastrous solution for a lot of the people, for example in South Auckland. You'd have your appliance retailers coming on and saying sell us all your carbon credits for the year, you can have a brand new washing machine for Christmas and all of a sudden they wouldn't be able to buy fuel, so I mean that idea has been promoted by some people and I think that is not the way to go. You might end up there in many years time but I think the starting point is to do it at the level that carbon comes into the economy. Another advantage of that and a reason we could get it up and running really fast like this year is that the obligation would be at the same level as the carbon charge that was abandoned in 2005 was going to be levied so a lot of the mechanisms that have already been developed for the carbon charge could be used to make that carbon trading start.

GARY TAYLOR
So as I read it, we've got agreement between you two [Nick Smith and Jeanette Fitzsimons] that emissions trading is a desirable end goal, but you're proposing an interim pathway to it, right?

JEANETTE FITZSIMONS
Yes but it's only a desirable end goal if the allocation of the units to trade is based on the physical reality of emissions and not on some politically negotiated, lobbied outcomes because nobody wins out of that.

GARY TAYLOR
Okay, Nick, what do you think of that idea?

NICK SMITH
Where I differ from Jeanette is she's saying if you want to go down the road of emissions trading there's all these complicated questions and so it would take you five years to get there. This is an absolutely pivotal question around emissions trading. Do you have to have the big bang theory where you do everybody all at once, or can it be a developing carbon market? For instance, what National has proposed in its Bluegreen paper is as a first step to develop a domestic emissions trading market around the electricity sector.

One of the advantages of the electricity sector is there are no cables that come into New Zealand. It's a closed system. Now there will be some cross boundary issues and then to phase in the introduction of the industrial sector, the transport sector and ultimately the agricultural sector but where we differ is I think it is realistic and it is actually a better implementation system for emissions trading to do it on a phased basis, ultimately with the goal of having an internationally consistent trading system but I think it is possible to at least get some of the bits. Why does National pick on the electricity sector first? One is it's very simple, there are only five thermal generators and so that makes it relatively simple to implement. The second thing is that we've had since 1990 the electricity emissions have grown faster than any other, about 138% and so its one of the areas where

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we think there are economical alternatives and we need to get a market signal into the electricity generating sector as quickly as possible that we want renewable owner thermals.

JEANETTE FITZSIMONS
Can I ask a question of him?

GARY TAYLOR
Yes absolutely, I'd love you to. I can sit back and relax!

JEANETTE FITZSIMONS
Five players in the electricity market are too thin to do a lot of trading. Are you saying that those five would trade with the international market or only among themselves?

NICK SMITH
Well I see the key trading would be if you had a cap and trade regime around the electricity sector. The key thing is going to be with the forest sector that's going to want to have credits. Effectively we would establish a position that was similar to the Environment Court decision on Stratford and that was that any new thermal generation would need to be offset by new forest planting.

Now your view that if you've only got five players there will be no market. I don't agree. I think that is enough for there to be a market and secondly you're going to get that immediate incentive of the cap where you will be able to say to at least one sector - and we've got emissions growing in all five - at least in one sector that we've been able to at least bring a close on the growth of emissions so I think that would be a realistic first step. I'm watching with a great deal of interest the work that's been commissioned. I think by Business New Zealand, Peter, that is in calling NZEIR to produce a report for late March on the viability of how you might phase in an emissions trading system and I think that work will give us a better handle as to whether this concept of a phased introduction emission trading is realistic because I do agree with you in this respect, Jeanette, and that is to have no pricing signal at all until 2012 is too slow, it's going to mean a whole lot of decisions over the next five years that will be counter productive to our long term goals on climate.

JEANETTE FITZSIMONS
May I ask another question? It's quite a short one. Why when transport emissions are so much larger than electricity emissions and are growing so fast, would you exempt the transport system at this stage, why would you not have something that went right across the energy sector?

NICK SMITH
Yeah National picks on the electricity sector first, for the first reason that administratively it's quite a lot more simple. That is we've got about three million car users in New Zealand, running an emissions trading system for them is going to be a lot more complicated.

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JEANETTE FITZSIMONS
We've only got five oil companies.

NICK SMITH
The second area is that if you look at the pricing alternatives, if you want to produce power from wind or hydro or geo-thermal the price is not that much more expensive than it is for the thermal options. In other words the cost to the economy of capping your electricity emissions is less than what they are for transport.

Now the truth for transport is that the options are less. If you ask National to identify where do we see the order of phasing in emissions trading market, our first would be the electricity sector, our second would be transport, our third would be the industrials and that's very much dependent on international trade issues and finally agricultur because of the technology issues. We might be able to have a sensible argument about the phasing of that but that's where we see the start of the play at the moment.

DAVID PARKER
Well there's a lot of issues been covered there. The first question was about business opportunity. Out of change comes opportunity - that's true, and as we change we should maximise opportunity but the objective isn't to create business opportunity. The objective here is to reduce greenhouse gas emissions and I think we need to be clear about that.

The second point I would make is that a cost of carbon arises from your ambition to reduce emissions is a common misconception that Kyoto causes a cost of carbon. It does not. What Kyoto does is force you to measure the ost of your ambition to reduce emissions so you know. Let's not forget National Party's policy still has been at the last election and as far as I'm aware now is to oppose Kyoto 1 and its ratification and the fixed target to reduce emissions that is imposed by it and also to say that they won't embark upon Kyoto 2 unless everyone is in. Now we all agree that…

NICK SMITH
Let me talk of National Party policy.

DAVID PARKER
Well you've had a few little slaps at me so far Nick.

NICK SMITH
I don't want you to incorrectly present National policy.

DAVID PARKER
Well I do still remember quite clearly that we have been criticised for ratifying our Kyoto 1 obligations and if you say that you now agree then I'd like you to publicly say that so could you stand now and do that?

NICK SMITH

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National thinks it was foolish of Labour in 2002 to ratify the Kyoto Protocol. The officials' advice - and it still holds that view, we believe that the targets are quite unrealistic - all of the officials' advice is that New Zealand will have a substantial deficit and I'd like the Minister to explain how sending a cheque to the Russians or the Ukranians for at the moment the estimate is $640m, how sending a cheque to them for $640m is going to do a lot for climate change. That is my view that…

DAVID PARKER
This comes back to the essence of the National Party's, with respect, hypocrisy on this issue. You cannot have a cap and trade system without a meaningful cap. Cap and trade, cap and trade, not trade around something so that you're exchanging something that's valueless because you haven't got a cap. Cap and trade, and what did we hear from Nick then? Cap electricity emissions at 2007 levels and do nothing else. Well that will be a really effective cap and trade system won't it?

Let's deal with the other issues. I agree that cap and trade is important. I have a lot of discussions with Jeanette and agree with much of what she said then. We do exchange views on these things openly and some things not so openly because there's a relationship of trust there. In terms of cap and trade, cap and trade system focused on the electricity sector of 2007 emissions would be a meaningless gesture, absolutely would not have any effect on emissions because we already know from the NZES that's been put out with the costs of alternative generation types that renewables are in front of us so long as we can consent them and you know we're committed to consenting them.

Is Government policy already working in this area? Today you've seen Contact Energy come out and say that as a consequence of the change of policy settings that the government is proposing, they're no longer proposing to build Otahuhu C if they can consent to geothermal which they think they should now consent and win, two billion dollars worth. Now that's climate change policy working. That is the best evidence you've got of climate change policy working at the moment. Can I talk about cap and trade in other sectors because this really, this is where this discussion should be getting down to because I think you should agree that cap and trade at 2007 levels in the electricity sector only is absolutely meaningless. The big question we've got really is if cap and trade is an important part of the solution, then what should be the caps in other areas? Particularly around deforestation. Nick says he favours cap and trade in the forestry sector but opposes a cap on deforestation. A cap and trade system cannot work in the deforestation sector without a cap.

GARY TAYLOR
Can I just check whether we've got concurrence? I heard these two guys say that they favoured emissions trading but they disagreed over the pathway to it, is your position that emissions trading for the domestic economy perhaps linked to the world price is a desirable objective?

DAVID PARKER

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Okay there's a couple of very important points there. The first is an emissions trading system doesn't have to be linked to the world market to be effective. The reason that linking to the world market would be effective long term is that for the world to overcome climate change there have to be international transfers of funds to actually assist the developing world to avoid the development path that the first world has gone through. That's actually the only really important reason that it is important to have international linkages for carbon markets. It's actually the likes of the clean development mechanism under Kyoto that will be enough to assist developing countries to avoid more dirty coal and go for a cleaner technology, so to that extent international linkages are important. One of the really difficult questions for all countries in the world is how much you allow those international linkages to follow lowest cost remediation of greenhouse gas emissions because if you let them follow the lowest cost point virtually all of the emission reductions would be done overseas and none would be done at home. That's politically wrong and its also economically wrong for the country because we do have to have regard to our own self-interest here and I think it's wrong for New Zealand to increase its risk of future cost to carbon which is, sorry I'll go back a step

The multi-nationals are ahead of most other companies here. They've been told by their shareholders that there is a future cost to their emissions, both their direct emissions and their embedded emissions so they see and Holcim Cement would be in agreement with this I hope, in fact they've told me this as have the likes of Comalco. Their shareholders are telling them that they see a balance sheet risk arising from a future cost of emissions, future cost of carbon, I remind you again that cost of carbon arises from an ambition to reduce emissions, not from any Kyoto Protocol and so they think that it's in their own financial interest to minimise that future balance sheet risk by minimising their emissions and what's true for them is also true for our country. So while in a strictly non-nationalist point of view, from a global perspective absolutely free trading of carbon credits would actually probably have better climate change outcomes having regard to both the imperative to protect your own national economy and also the political realities of these things. As Nick says, it's not very popular giving carbon credits to overseas countries to remediate their emissions, having regard to those factors you actually do have to come up with a split where your carbon trading scheme and the caps that you design have domestic effect but permit some international trading.

GARY TAYLOR
So that's a yes to emissions trading?

DAVID PARKER
Yes to meaningful emissions trading. I would think as described by Nick with respect Nick and I'm happy to be convinced otherwise but I don't see how that would achieve anything.

JEANETTE FITZSIMONS
Can I also clarify the Green's position on emission trading. Our ratified policy is still a carbon charge. We're exploring various options towards emissions trading at the moment because a carbon charge appears to have been widely rejected. We still think it would be

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the simplest way to go but this new approach to emissions trading that I like doesn't require this political allocation process. I just want to clarify that our party policy remains a carbon charge. We are currently exploring ways that you could do emissions trading without the political hoo ha that I described a moment ago and looking favourably on ways to do that and we accept that in the long run we are going to get to some sort of emissions trading regime but I think it's a little bit simple to say at this stage our policy is emissions trading.

GARY TAYLOR
Peter Neilson, the challenge is to find the most economically efficient means of putting price on carbon into the economy is it not?

PETER NEILSON
Well it's partly that. I think the other thing I think is basically like all these things the people, the other three people don't need to be in that, do have to be elected, I need to be elected by 56 people, they have to be elected by a much wider constituency and they have to survive the next three years. Luckily I've only got to survive the next year for annual appointment but basically in a smaller group. When I stopped being a politician and people said is it worse, I said, well at least I now know that the people who pay most attention to what I'm doing actually decide whether I keep my job. Unfortunately if you're a politician not a lot of people pay the least attention.

I think the important thing here is basically what's the end game? We've got a world that's basically going to from probably six billion people to nine billion people within our own lifetime. We've got a problem that already exists, that most scientific opinion says that the air is getting worse and we still have uncertainty about what is the safe level of CO^2 in the atmosphere. We know that if it's too low we freeze, if it's too high we have a problem with heat increasing and global warming but we don't know what the safe level of that is. In fact with that uncertainty there is a likelihood that we may be not talking about, I suspect, increases of flows into the atmosphere but in fact having to stop very rapidly at some point. We just simply don't know what the answer is.

It could be the other way round. We could find out that it turns around and it doesn't turn out to be a problem. In that sort of environment you basically need a relatively flexible instrument and it seems to me a process by which if you set a tax you're going to have exactly the same political arguments about what level it should be. It's virtually the same thing as we used to have a fixed exchange rate. Did it depoliticise the issue because we had a fixed exchange rate? No everybody moaned about it being either too high or too low for their purposes and they lobbied extensively about trying to adjust the level. If we had a carbon tax we would have exactly the same problems, just as we will have with the trading regime we will have people who say as they did for carbon tax, it's a great idea, I've found a way of exempting myself from it. Okay. So the poll just doesn't disappear. I think the reality is basically what is New Zealand's long term game in this position. Okay, we are international citizens, we actually do want to be part of a world in which we try and improve the situation because basically we're only four million people and if we

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don’t get international agreement on some things we’re always going to be done over by that process.

Second thing, is New Zealand disproportionately adversely effected by a carbon tax? It seems to me that if you look at our internationally traded commodities by and large, we’re actually more efficient in terms of emissions than most people so if there was a world price on carbon in all countries, we would not be disproportionately disaffected. So really what we’ve got is a divided world, we’ve got a world at the moment in which the major players are not part of the regime. If that was to change tomorrow, New Zealand would not be adversely effected by going there and it seems to me that we’ve really got this problem. We’re actually having two debates. We’re having a debate about what’s best for New Zealand pre-2012 and then what should be best for New Zealand post-2012 and I think one of the problems we’ve got here is we’re arguing partly about the tactics of dealing with the first period versus what is the long term gain but all I know from my members what they’re saying is, get your head around what the long term gain is because what we do in the immediate period is important for now but basically long term as well. As long as it's compatible where we want to go, let’s start moving on that now in anticipation of a world in which probably there’s going to be much more participation in the regime in the Kyoto replacement than the current regime.

GARY TAYLOR
How big a problem Nick is the fact that we ve got 50% of our emissions in the agriculture sector and what’s National s position? Do you think they should continue to be sheltered?

NICK SMITH
I think it makes New Zealand’s challenge around the emissions reductions so much harder than many comparable developed countries. It's such a large portion of the market from the agricultural sector and we’ve got relatively limited technologies at the moment that will reduce those emissions o her than reducing stock numbers. National makes no apologies for its sort of Bluegreen vision of saying actually we want New Zealand to be rich and clean and so simply providing for instance, imposing a tax or a carbon emissions regime currently on the agricultural sector will provide only one incentive and that is to reduce stock numbers and we don’t think that will be smart. So in the first instance what National says is we should be going hell for leather in terms of investment and technologies that might solve this problem. In fact given that our emissions are what, about .4% of the world, that agricultural emissions are about 15% of global emissions, if there’s any area in technology in which New Zealand can punch above its weight it's in this area of agricultural emissions path.

Now New Zealand has a long established history of leadership with respect to agriculture, animal husbandry-type science. We’re disappointed that the government is spending about $4m a year in this area of research. There are about $4m of research programmes that have been turned down. It's National’s view that these sorts of numbers are beer money in the context of climate change and in the first instance the government should be

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backing any conceivable research programme around agricultural emissions. It's the area where New Zealand can make a contribution.

I would say that in the paper that's been produced by the government around options for incentives for better use of fertiliser and some of the technologies that are already developed there we are sympathetic to some target economic instruments that will provide some incentives for farmers to move to the latest technologies, to use the right sort of nitrogen fertilisers. So those sorts of ideas that are expressed in that paper, National thinks, has real merit and quite frankly not just from the issue of climate change, also from the issue of water quality of which we have some enormous challenges.

GARY TAYLOR
So Nick in Taupo we've got a lot of conversions involving going from pine plantations to dairy farms where we get a double whammy don't we?

NICK SMITH
Yes we do.

GARY TAYLOR
Should there be some pricing signals in there to factor in all that?

NICK SMITH
The issue that GARY TAYLOR has raised raises a huge issue of deforestation. Can I just give you a number for your mind which is where National is a little cynical. The Prime Minister made a big deal in her s ate of the nation speech to parliament of Treasury becoming carbon neutral. That will save two ton of carbon per day. We currently have deforestation going on at 22,000 tons per day. National says the single biggest urgent priority around climate change policy is to halt the deforestation and create the investment opportunity. Now they will ask how. The first thing the Government should do is drop its proposal of a deforestation tax. In my own constituency in Nelson right now I have owners just cutting Christmas tree age pinus because they are terrified they are going to get whacked with this proposal of a $13,000/hectare tax so that deforestation tax…

DAVID PARKER
It's never been that.

NICK SMITH
Well the paper has specifically said $13,000 per hectare.

JEANETTE FITZSIMONS
No it does not.

NICK SMITH
Well what number does it say?

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JEANETTE FITZSIMONS
It says it's valued at $13,000 but the foresters would not be charged that as the state would bear some costs.

NICK SMITH
Well it's not specific. The only number we have, well the paper says this figure of $13,000 a hectare and then it says in fuzzy language afterwards, we haven't determined what proportion of that $13,000 the forest will be hit with but if you are a landowner in Nelson or Canterbury or all over the country, there is deforestation occurring at a most wasteful way right now because of that signal and I say it should be dropped. The second thing is the Government's got another daft policy…

Hang on a sec. Let me finish, because what you have now is the government has said, we are in the first Kyoto period going to put a cap of 10% on the level of deforestation. It might sound sensible, it provides some limit on the liability that they have to report. The problem is there no idea which 10% so if 10 of us own forests, if I get my chainsaw started up early and whack mine down I'll avoid the liabi ity but if you're the good guy and the last in the queue you're going to incur a liability. National says that s nuts.

What we need to do if we're going to stop deforestation and we've had the worst three years of deforestation in 50 years, no coincidence that it started in 2004 the year after the government said it would not allow any credits. The sensible thing for us to change the culture and the investment climate within the forestry sector s to move as quickly as possible where we have the liabilities and the carbon credits lying where they fall. That is if I'm planting trees that I am able to gain the credits and if I am cutting down the trees I am incurred with the debts and the sooner we move to that, that sooner you'll get the right incentives in the forest industry and what you've got going on and look the Minister will be quite honest with you. What the forestry industry wants is the best of both worlds. They don't want the liability for the pre-1990 forests, and they want the credits. That ain't credible. What the Government wants is to dump them with the liabilities but not give them the credits. Any honest person would say its got to cut both ways, foresters who plant will get credits, foresters who cut should get debits and the sooner we move to that regime you ll see a change in the investment climate within that important sector.

GARY TAYLOR
Full devolution which is what Nick Smith is proposing, was on the table in 2002 and I think almost happened.

DAVID PARKER
First of all in respect of agriculture, I agree with some of what Nick says. Can I thank you Nick for, I thought it was actually quite a brave move for Nick given your constituency in respect of the incentive for nitrification inhibitors to be funded by a charge on nitrogenous fertiliser. I thought that was leadership so thank you Nick because that's one of the proposals that we have out there at the moment in that space.

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No-one, no political party is going to close down agriculture in New Zealand. No-one is going to threaten its viability. I don't think Jeanette wants to do that, we certainly don't want to do that, neither does National. I mean it just wouldn't be economically sensible for New Zealand so I think you can take it as said that no-one is going to do anything that is so hard on the agricultural sector that it threatens its viability. If you accept that as given and then you ask yourself, well nonetheless is there a role for the agricultural sector to play to take responsibility for their growing emissions, well that's a question that has to be talked through and this is the issue that the country ought not to run at too fast but it ought to discuss and because given the context of New Zealand's emissions profile to actually just dodge that in saying it's so important we actually should do nothing I think is a step too far. That is an abrogation of responsibility. I think from a political level that we shouldn't allow that to come to pass because that would be wrong and that would effectively put the burden of greenhouse gas remediation disproportionately acro s o her sectors notwithstanding that there are things that can be done in agriculture alr ady.

Now farmers aren't doing anything wrong. There's no moral turpitude in growing cows. They're not doing anything wrong but there are things that farmers can do. High sugar rye grasses have lower levels of methane emissions than low sugar rye grasses. Nitrification inhibitors do work in some places, not everywhere. Breeding efficiency has improved conversion into milk protein at the rate of 1% per annum over at least the last 12 years, probably the last 20 years so over the last 20 years its become about 20% less methane intense and that's without breeding for methane efficiency. It's been a de facto outcome rather than an ambition so there are things that can be done. I think we should be talking about whether, no I'll say another thing, the Kyoto negotiations last year ended in express recognition of the principle that in future negotiations and the ability of sectors to reduce emissions must be enacted into agreements. That also coincides with the ambition of first world countries to get developing countries in some sort of a framework and developing countries have proportionately higher levels of emissions in their economies than developed countries. We're the exception in developed countries but our profile is more similar to developing countries so again, we've got this negotiating position which I think will lead us to be able to achieve a good outcome for our agricultural sector and the nation but to achieve that we have to be seen to be doing credible things in agriculture and I really do think that we have to talk about how broad emissions trading should be. We definite y, and I've always said this, have to have different levels of stringency in different parts of the community and our expectations of individual sectors should reflect what we negotiate internationally too and should lead towards what we are arguing for internationally but I really think we shouldn't discard the idea of getting all sectors into an emissions trading regime albeit with different levels of stricture, different dates when it comes into being.

Can I talk about deforestation? We're not applying any different principle to the forestry sector than we are applying to any other sector. At the moment people would have you believe that we are picking on them. That's not right. Historic rates of deforestation in New Zealand have been 1-2% of the mature area that's forested not being put back into planting, not being replanted but having a change of land use. In the last two years that's changed to 7% per annum. Its tripled so effectively the marginal emissions from

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deforestation have tripled, a 300% increase. You have to move in that space. You have to have a policy response to that. Apart from anything else what's causing it is a profit on lands conversion of $3-4,000 a hectare. The economics of forestry in relative terms have gone down compared with other agricultural land uses, the profitability of which has increased, notably dairying. So the land value for dairying net of all of the costs is about $3,000 more per hectare and it varies but that's roughly the average than it is to replant it in forest. Now that $3,000 profit is what's driving the deforestation. The cost to the country is $12,000 a hectare because for every hectare of forest that is not replanted under Kyoto rules we have to account for $12,000 of carbon dioxide emissions, so chasing a $3,000 profit whereas the country is suffering a $12,000 loss we have to do something in that space.

GARY TAYLOR
So doesn't devolution deal with that?

DAVID PARKER
Well that's, in terms of what we're proposing we are actually, NICK SMITH said how do you pick which is going to deforest and which isn't, you don't. You actually use a tradeable deforestation permit that is rateably given to every forester and the foresters that don't want to deforest, even now it's 93% of them by land area, they've got a credit. If they don't want to deforest at all they can sell the deforestation credit to those that do and the rate of deforestation permits that is allocated would carry some of that cost to the Crown, effectively to taxpayers and the market would actually settle in the end at no more than $3,000 a hectare because that's actually the profit margin on land conversion.

Now in terms of devolution of credits. Let's not flagellate ourselves here. New Zealand is already a leader in this area. We've already devolved full devolution for carbon credits for permanent forest, for everything planted from now on and the discussion paper on sustainable land management we proposed as one of the options full devolution of carbon credits for all production forests that are planted from now on as well. So what we're not proposing is devolution of carbon rights for trees that have previously been planted. We're not proposing devolution of liabilities for emissions, for things that are the base level as well here either. It's the same principle as being applied in other sectors. For us as a country to be able to afford to fully devolve carbon credits to existing planted forests, that's a billion dollar bill and it would effectively either put up taxes or have to come from other sectors like the agricultural sector which could threaten their competitiveness at risk and so we're going through a transition to full pricing.

GARY TAYLOR
What I'd like to do is finish off on agriculture and forestry, if either of you two guys have got anything to say, then talk about post 2012 quickly and then open it up to everybody.

JEANETTE FITZSIMONS
Starting with agriculture, we cannot afford to keep on increasing dairying at the rate that it's expanding now for reasons of water quality, for reasons of soil, for reasons of methane and greenhouse emissions, so I would say that the agriculture industry up to

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where it was in 1990 should not be exposed to a price of carbon because it doesn't have alternatives. But the growth in dairying does need to be exposed to the price in carbon because New Zealand simply cannot afford for all of those reasons to see more and more and more land going to dairying, particularly in the areas where it's happening which have high irrigation needs, which have high nitrogen application, which have major effects on water quality. So I would favour a way of making the dairy industry collectively accountable for the increase in emissions but not for the baseline.

GARY TAYLOR
Because otherwise taxpayers are subsidising dairy farms?

JEANETTE FITZSIMONS
Absolutely. Well all of the policies that have come out in 2002 to now are giving agriculture a free ride and I don't think any part of the New Zealand economy can have a totally free ride. I think the obligation has to vary from a full obligation as with energy to a marginal obligation for growth in those areas where they don't have a lot of technological options.

Now in terms of forestry, you cannot afford to use forestry credits that New Zealand earns from the expansion since 1990, you cannot afford to give that back to the forest industry unless you're making the energy sector face the cost of its emissions otherwise it's a wealth transfer from the taxpayer as well. If we're looking at who should pick up the bill in 2012, yes if you have the energy sector and I'm including transport, picking up its bill then you could use the credits that New Zealand earns in 2012 for expansion of forestry to go back to the forest sector in some way but it's a little bit more complex than that. You can say well those who've planted since 1990 have earned those credits, but actually they haven't because under Kyoto those credits only accrue to New Zealand if the 1990 forests don't deforest. If the pre 1990 forest is shrinking then the amount that the Kyoto forest earned is also shrinking because we only get credits for the net increase so I'm working on ideas at the moment and I'm not talking Green Party policy here, to use those credits across the forest industry and I think some of my thinking could work quite well with what the Minister has just put out in the paper yesterday about the tradeable deforestation credits. I wouldn't call them deforestation credits so much as just that all foresters have got some credits to recognise the carbon forest stores then that is a disincentive to deforest if at the same time deforestation and conversion to dairying is going to put a cost on the dairy industry for that expansion, you've got a small price sitting on each side of that transaction I think fewer of those transactions will take place. I could go on but I'm sensing that you don't want me to at the moment.

GARY TAYLOR
Let's jump somewhat disjunctively to post 2012 and just have one round perhaps from each of you on what you think the post 2012 scenario ought to look like and what you think New Zealand's advocacy in international for a ought to be. Why don't we start with you Jeanette and work round.

JEANETTE FITZSIMONS

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Well we've got to overcome the big hurdle that we had in '97 at Kyoto and the Hague at 2000 about what to do about getting developing countries on board and to require them to reduce their emissions at the same rate as the OECD countries have to reduce theirs which is totally unrealistic. They're at a totally different stage of development. An idea that has been put repeatedly in front of the international community since the mid 90s but to my knowledge has never been taken seriously in any negotiations is as a starting point does every human being on the planet have an equal entitlement to the atmosphere or should we ascribe to the colonialist view that one Englishman is worth 20 Chinamen because that's what we're doing at the moment. We blame China for having a lot of emissions when it's got a quarter of the world's people. China's per capita emissions are far, far lower than ours, many times lower than ours per capita but they've got lots of people so doesn't that give them a right to lots of emissions? Now you wouldn't stop at that totally crude level of per capita equals per capita emissions across all countries but I think you should take it as a starting point and you should take it as a goal that you gradually work towards over time and then you trade in order to get there. I think the rich countries are going to find that completely unacceptable because their starting point is that the rich countries must always remain richer than the poor countries and that's really the stumbling block but I would like to see New Zealand as a small country with a long reputation for equity and justice arguing on behalf of that notion of equity.

GARY TAYLOR
But is it a cap and trade continuum post 2012?

JEANETTE FITZSIMONS
Oh look the mechanisms that have been so painfully and long set up for Kyoto 1 you wouldn't chuck them out and start again but it will change. I think countries taking obligations to reduce has got to be part of it and there's got to be some kind of equity among those obligations. I think trading has to be part of it. I think you can perhaps build further on the mechanisms like CDM but the other big thing that's going to have to happen past 2012 is that the target is going to have to bite a whole lot harder. Kyoto is just playing at the edges of the problem. A 5% reduction across the OECD is going to do very, very little for the climate. If we're going to move to the 60%, even 90% reduction that many scientists say are necessary by the middle of the century, we've got to start that move now. We can't do it all 10 years before the final target. Every tonne that we emit now makes things worse so it's going to be tough.

GARY TAYLOR
So NICK SMITH there's Kyoto, cap and trade, CDM to encourage technology transfer to developing countries, more in the camp, isn't that the rational way forward?

NICK SMITH
I think the really hard thing post 2012 is about what happens with the big emitters on the globe. New Zealand is only a bit player in this and what happens politically in the United States I think there are some small signs of optimism if you look at the key vote for Republican and Democratic candidates that are coming out of the woodwork, they certainly give high priority to climate change in the current American administration.

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Although I also have to say that even if you look within the Democratic camp and changes that have occurred in the Congress. There isn't any great move, if you go back to the original ratification of Kyoto in the US, it was by, I think it was 100 votes to zero and so where China is, where America is, where Brazil, where Russia remain around that, they're the big growth emitters, its going to have a big impact on it. I think Jeanette quite rightly identifies a real tough issue, is do you take a deal that there's an equal take per head of population on the atmosphere, what do we give to that, vis-à-vis the weighting of your historic emissions and the size of your country? I think the most important thing is if you're going to make any sort of cap and trade regime work there have to be caps on all countries. Now it will be true that a country like China will say of course they're an under-developed country and they're only going to grow by about 20% whereas you're expecting reductions of other countries but if there is not the diversions that will occur around any cap and trade regime will create distortions and make the thing unworkable.

The second thing for New Zealand is that the Europeans at the moment are saying post 2012 we're going to take commitment regardless of what those other countries will do and the hard call for New Zealand is do we follow Europe's lead or do we do something different and it is certainly National's view that New Zealand cannot afford to hitch its wagon with the Europeans. Our economy is radically different. The Europeans with their very heavily subsidised agriculture and other things means that we would be unwise to take that route and quite simply National takes the view that Australia is the most significant player for us. Our economies are so integrated that if we get ourselves hugely out of step and I certainly would want us ahead of the Australians but the further we go out ahead of them the more trouble we get ourselves into and so the reality Gary is that what happens internationally does have an impact on how hard we can go in New Zealand. It is pointless for us to go out in the cold. We need to do what we have, make sure New Zealand is a leader but not go out in the cold by ourselves.

As far as I can read the situation basically in both Australia and in the United States the Government administrations' current climate change policy is actually unpopular and is likely to change within the next two years. If that happens in both of those countries, they basically are debating what sort of cap and trade regime, what sort of cap would be acceptable and the reality, the characteristic of the countries holding out are disproportionately reliant on coal for the source of electricity generation. Nobody wants to ask their voters to effectively vote for a cold shower by cutting out current production of electricity from coal so very much is tied back to when do those countries have comfort that they will have effectively a lower emission or less emission to the atmosphere use of coal to produce electricity. I think that is sort of a 10-15 year period of time, if that happens people will be prepared to actually look at effectively a curved bend which does provide you with a cap, if those countries are in then I think it's highly likely that there will be most of the world in terms of the less developed countries in terms of an arrangement. Whether the rest of the world will be able to be brought in, my suspicion is yes provided there's a curve again, which may not, the curve may not bend until 20 years out but as long as there's a curve in the trend line that will be helpful and I think there's much more probability now than there was even a year or two ago in terms of the probability that it would be happening. If that happens then a world wide cap and trade

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regime makes a great deal of sense and that is not necessarily adverse for New Zealand's interests even in terms of narrow production of what we currently make and sell.

So I'm relatively more optimistic than I was a year or even two years ago but I think that it's not all over yet. There are going to be very, very hard negotiations but there is a completely different world from people saying we've got to fix this problem and we're prepared to take a cap to let's game a process by which others will make sacrifices and somehow we'll stay under the radar and try and escape. I think that that game is coming to an end, probably only got four more years to run but that game is coming to an end and basically on the horizon we cannot assume that even with Australia aligned that we would actually be able to influence the total world.

The reality is, French Prime Minister last year asked the European Union could we investigate having a tax on imports of goods from countries and services that do not have some sort of cap on their emissions. That is the start. If you've got an instinct to be protectionist you'll use any argument to raise it. That issue will not go away and I suspect that if there is a European commitment to a cap and they're serious about it, looks like that is increasing confidence for that to happen then, I think that we're looking at a trade war based around how people, how countries perform in terms of climate change issues so we've got to catch up pretty quickly because it won't be a matter of selling more because we're nice and clean and green, it may be a matter that you won't sell at all because you haven't taken a commitment to do something.

DAVID PARKER
I'm an optimist here. I think the world is getting its act together. I think things are moving really fast internationally. I think it will be absolutely crucial to a future international agreement that the United States joins. Australia with respect to them, is just about an irrelevance. It's a bit more out of it locally but of course the cost of greenhouse gas reductions in the energy sector especially is far higher for Australia than it is for us, far, far higher. The cost of this transition in the energy sector is going to be cheaper in New Zealand than virtually anyway else in the world so it's going to be a point of comparative advantage rather than a point of comparative cost. As I said before I think in terms of the agriculture sector I think all countries will be relatively protected from overly ambitious targets there if there's no technological solution given recent agreements at Kyoto. So I think the US will take part. I also agree with Peter Neilson that this will be used as a trade issue and those exporters that are most at risk are those that export products that they want to protect which are effectively farm based products so irrespective of whether the Americans come and there are very real trade risks for New Zealand which means that its in our trading interests to act now and not wait to see what the Americans do.

GARY TAYLOR
Okay thanks. So what I'd like to do now is to open it up. If you want to ask something if you can stand up because we need to get the boom over to ensure that we record your question or statement. We'll do that for a little while and then we'll come back to these

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guys and see if we can get them to agree to re-kick start the multi-party talks which were cancelled a week or two ago owing to some fracas within the parliamentary precinct.

JEANETTE FITZSIMONS
There were never any multi party talks. That was a statement National made.

GARY TAYLOR
Okay, alright so what we're wanting to do is to come to the question of how civil society can get these guys to start talking, at the end of the seminar but first any questions or comments from the audience please.

MURRAY WARD (audience)
My name is Murray Ward from Global Climate Change Consultancy in Wellington. I was interested that it was only with Gary Taylor's prompting and then Jeanette Fitzsimons picked up on that, that the issues for the taxpayer for New Zealand were starting to be revealed and I think that we've seen issues from these discussion documents. For example, where in the land use document around agriculture and forestry it's kind of pretty front and centre about the potential costs to the taxpayer of potential increases in emissions whether it be from deforestation or whether it be from agriculture sector, so it's been quite clear in that set of documents.

It's been completely missing in the energy documents and so I guess the question that I would have is based on the fact that from 1 January 2008 we as taxpayers face the cost of the international price of currently every extra tonne that could have otherwise been reduced through effective policies, why is it that we would not be moving quickly especially in the energy sector where we're seeking to get efficiency responses to get the international price of carbon into energy prices? So I haven't got a clear picture from any of the discussions whether it be from National's policies or Labour's or the current Government's policies whether you actually think energy prices should be quickly reflecting the international price of carbon. I heard David Parker say it wasn't necessary for effective policy for that to be the case. I don't agree with that and I'm coming from the perspective of the taxpayer. I think its absolutely necessary so I'd like, so my specific question is under your policies to do with the energy sector, broadly and perhaps electricity sector, specifically when do you see the international price of carbon coming into those prices?

NICK SMITH
: I like you disagree with the Minister around his optimism of the electricity sector moving to renewables. Effectively a good way to look at the future is look to the recent history. Over the last seven years under current government policy settings we have seen huge growth in thermal generation. We have seen major renewable projects like Dobson, like Aqua dropped, we've seen the amount of electricity produced in New Zealand from coal treble in the course of this Government's history, treble, for a Government that's talking about carbon neutrality and that is where National says that we should move to a cap and trade regime within the electricity sector at the first possible opportunity. Now people say well leave it at that, well you're the opposition. We've got an election

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November next year, what we said in our Bluegreen paper is to move so there is that price, what we want is that when the investors in the electricity sector whether they be state owned enterprises or private enterprise are making a decision to build new generation capacity that they include in the price of carbon into that decision.

Now you talk to the likes of Contact and the Minister rightly says that Contact earlier this week made some statements about increased focus on renewals. They are to some degree responding to the threat of carbon trading carbon taxes because they're making investments for example for 14 years but the sooner that we bring that to a finite point where there actually is a cap and trade regime around the electricity sector you will not get the shift that we need and that is investment in renewals over thermal generation.

MURRAY WARD (audience)
Can I just ask about the international price, you haven't really answered about getting the international price of carbon into energy prices, that's like the specific question.

NICK SMITH
And the question is it possible to create an emissions trading regime for the electricity sector that is linked to the international price and I have to say to you Murray that emissions trading is complex, I accept that. There is more work at the moment, National put the Bluegreen paper out last year, we closed submissions at the end of this month. We have got 24 sector group meetings lined up over the next three months including with the New Zealand Institute of Economic Research that is develop ng and doing some work for us as well around the viability of that market internationally and I'm not prepared to comment further at this stage.

DAVID PARKER
The first point is you could actually reduce power sector emissions or at least curb the growth by having a very simple rule under the Electricity Act that effectively says that all new capacity has to be renewable and I think we'll find that when submissions close that we might be getting submissions from quite a few of the major energy users who think that that's the lowest cost route for New Zealand. That doesn't of course necessarily lead to the retirement of existing thermal over time but as Peter Neilson said you have to be careful hat you don't close things down before the end of their useful life if you can reduce emissions in other ways that's cheaper. You should do what's cheapest.

In terms of history Nick Smith quoting history, I like recent history rather than older history and I do think that today's announcement from Contact which I've got here, it proposes a $2b investment in wind and geothermal and pushing back the development of Otahuhu C as a consequence in response to the draft New Zealand Energy strategy. I actually would like to think that people take that on its face and actually think that they're not lying and that our strategies are actually working. In terms of how soon prices should link to, whether the markets should be local or international. I've got an open mind on that. There are pros and cons both ways. Yourself or someone mentioned how the European price of carbon is lower than perhaps might be its long term price as a consequence of the method of allocation and the generosity of allocation of emissions

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unit, well if you were of the view that that was a falsely low price then maybe linking in with what is a plainly flawed market would actually not be sending the right economic signal in New Zealand so I'm open minded as to how soon they should link.

JEANETTE FITZSIMONS
It should be the whole energy sector and not just electricity. There are huge opportunities for carbon reduction in transport once you get past the mind set that says the only alternative technology is putting something different in the same tank, once you start to recognise that the transport, that the opportunities in transport are much, much more than using an efficient vehicle using like a third to a half of the fuel to go the same distance as we're using now and that they include a whole range of things like ride sharing, urban public transport. You build it, they'll use it. What last year proved was that when fuel prices go up people do leave their car at home. And the buses and the trains run pretty full at rush hour and there's not enough of them… so yeah we have to move o it…

PETER NEILSON
I think on this issue probably the most honest answer is basically get a price on carbon, get it as wide as possible covering sectors and do it as quickly as you can. Quickly as you can is a bit of a variable because you've actually got to live with the fact that the existing Kyoto arrangements do not perfectly align with the particular circumstances of New Zealand. It was a human system, it doesn't actually reflect or cover all of the issues that we face but I think what's coming through in terms of where the public are, last year we had an oil price that took the price of 91 octane at the pump up to $1.71. People did respond. That was a price spike but it was probably four or five times more than I think any forecast about what the likely carbon price might be in a market say for example in Europe where there were caps that were actually enforced, that worked by constraint. So the fact of the matter is that we could do it. Now what was the difference. Well nobody could blame anybody in New Zealand fo the fact that the price spiked to $1.71 and why we need a multi party agreement and some solidity around that is for exactly that reason. If a government of whatever complexion makes the decision to put it in, and everybody says isn't that terrible because somebody will suffer from that change, the reality is the policy doesn t work and if that happens, we've got a major issue.

So the pleading that comes from both the public and from business is could you please agree that there has to be a cap, that we're prepared to have a price on carbon and try and do it as soon as possible and the reality is unfortunately the politics of this is everybody is a bit embarrassed by their past record and like inflation and like superannuation you probably aren't going to get applauded for doing this but you will get condemned if it doesn't happen So its not a matter that is going to win a huge number of votes for your party because you've come to an agreement but if you don't, the feeling of the public about whether parliament is effective is going to be considerably diminished.

If I could reflect that I'm old enough to remember one time when we did have an issue that was quite divisive in the community which was the Vietnam war and at that stage there was basically strong political division to the issue and Norman Kirk was offered the opportunity to get full confidential briefings on what was happening in Vietnam and the

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Government of the day would have liked him to have done that. Basically he said no, I'll step out of that because I want the ability to keep on criticising. If I go in and have those conversations the reality is I can't say the same things because I know more than I should do and I think we've basically got to get the comfort that if you go in and do those things eventually you're going to have to pay the price in terms of not being able to have some arguments which might be convenient and that's why I see the desirability of having as many parties in that meeting as possible because the one party that stays out is the one that's got the best leverage in terms of whatever you do you can always be condemned by whoever gets out. So our pleading is basically agree on a cap, agree to a price and try and get agreement if possible as quick as possible with as many parties as possible and likely to be represented in a future government.

GARY TAYLOR
So just from a political point of view, Jeanette Fitzsimons maybe, how do you make that happen because that's I think where EDS is coming from. We would like to see there is some common ground here that's emerged in recent months around what the ultimate destination is, some broad based emissions trading across the whole of the economy, there's some disagreement around the pathways and the timelines. How do we get politicians into multi-party talks, what kind of undertakings and processes are involved to do this?

JEANETTE FITZSIMONS
I don't know how you can do it. I don t think you can ge the parties themselves but I think there are some ground rules that you can set to say that if you did start it might work.

The first one is that you can't do it under the glare of the media. It would have to be in private. If you got reporters there, even if you got reporters knowing it's happening then there's just too much temptation to grandstand and for the media to go round and try and put people off and what do you think is happening, so it would have to be in private. I think it would have to, you would have to have an agreement to start with that no party talked to the media until everybody is prepared to say we have talked and this is what's come out of it. I think you'd need an independent chair. I think you'd need not to aim too high. There s no way I think that all parties should end up with the same policy on climate change. That's what politics is about, is contesting ideas and that contest of ideas has go to remain but the important thing for New Zealand is that when there is a change of government there's not a complete flip flop and back to the beginning. Mind you that can happen even without a change of government. But I think it is important that there is some durability to policy and I think if you only aim at some of the principles like I think we may have lived past the point when last year I called for some cross party talks I said can we start by trying to get agreement that the science is real and that the matter is urgent. I think we might have already achieved that without having talks. At least the parties that are here, there are others in parliament that don't accept that and probably never will and then if you were to agree that there needed to be a price on carbon, that would be great because then you'd only argue about how you were going to get to the price on carbon and if you agreed to have a price on carbon and one party put it in then

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probably the opposition wouldn't take it off again after the next election if they won so you know let's stick to principles like that, let's try and get some agreement about whether and how much and when agriculture should face some of the costs of the emissions because that's actually crucial. Yeah I think those are the main things.

GARY TAYLOR
So Nick Smith, is that the sort of framework that you'd be aiming for?

NICK SMITH
Well I think there's two really good reasons why some cross party agreement around climate change makes good sense. The first is from the point of view of investment. People make investment decision on 40 or 50 years and they want to know what the rules are and even if there are going to be some periods of change of government, there's some consistency of policy, you're going to get more sensible investment decisions nd the second thing is, let's be honest, New Zealand is a pimple on the planet. When David goes overseas he does a good job of representing New Zealand's interest in climate change negotiations. We are more likely to have influence if there's consistency from one government to another, if there are flip flops around the little bit of influence we have on what happens to the globe is reduced. So broadly speaking National thinks it's a good idea. I originally wrote to David December of the year before and said let's have some talks about this and didn't get a response for over a year. The Government, David, wrote to me in January and said here's a copy a month after the documents were put in the public arena, the discussion documents and said very kindly here's a copy of these, well they were web site about a month earlier. You're not going to get cross party talks if you advance that process. We need to be at the grass roots of it. We need to be able to have the dialogue with officials. We need to have access to the same information and the greater degree to which the government and I say this to the Labour Party whether I'm in government or opposition is the greater degree to which you're involved the more you surrender your right to criticise and that's just an understood quid quo pro. The conditions that Jeanette Fitzsimons has put forward are an independent chair, I think is sound. The second thing is it is my view that it needs to be chaired on Chatham house rules. David will no doubt note that National declined his invitation to attend a meeting a week ago because on that very day…that's right. Well what happened David wrote to me and said let's have a meeting next week and I said yeah, and then what happened is Dr Cullen went into the House and breached, it's important to note so that we know what goes wrong, well there have been Chatham house rules meetings around monetary policy and to score political points Dr Cullen disclosed things that were discussed confidentially and National said Nick Smith, you're not going on our behalf if that's the basis on which the talks will be i.e. I have a private chat with David, next minute he goes into the house and spouts what's been talked about. That's why Jeanette Fitzsimons has rightly said that you've got to get some ground rules in place. So I've indicated to David that if he will get some ground rules established around Chatham house rules and those sorts of things, I'll be in your office tomorrow but we do need to have some ground rules established for it to go somewhere. I, like Jeanette Fitzsimons, think that there's actually a lot more common ground than what you would believe. I think we can get to agreement across the parties. I think we can get to agreement around what the long term policy objectives should be. I

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think we can get some agreement around the sorts of issues like around work towards trying to get some pricing signals to get the right sort of outcomes and I'm comforted today David by some of the things you've said around the electricity sector, around, that is a sector that is going to need new growth and where we should be going in terms of renewables. So National's door is open. We need to get the ground rules established, independent chair, Chatham house principles around it and National will be there before you can Jack Robinson.

GARY TAYLOR
So, David, Chatham House rules, independent chair, and the next step…

DAVID PARKER
The first thing I would say is any good politician is a magpie for good ideas. You see little bits of silver glinting there and we pick them up and we own them so we've got consultation papers that are out there until the end of March and maybe there are going to be some little bits of silver that drop out from people's submissions on those processes that we'll pick up, little matters of detail that we haven't thought of that are important that we should pick up. I'd be a bit surprised if there are areas that are great big miracle cures that are out there that we haven't spotted so far so I think by the end of that period we will have considerable agreement within New Zealand from New Zealanders as to what the spectrum of this debate is. Can we bring that together to cross party agreement? Well I think the prospects of that…cross party talks leading to agreement as to how we progress. Some prospect of some cross party agreement as to where we should be heading.

Well the prospects of that are probably better than they were a year ago because actually the public wants us to do things and therefore the politics of doing nothing have become unsustainable. The Climate Change Response bill, virtually unchanged from its first reading, passed unanimously in parliament the end of last year. No-one voted against it. First and second readings had been absolutely panned by the opposition and we'd been criticised for at election so things are coming together.

I have to respond to Dr Smith's comments about what happened recently in respect of monetary policy. You can read what has now been reported in the newspapers as to what happened there. That was actually an attempt at cross party agreement, below the radar, doing something important on monetary policy and what happened when the media got whiff of it, national distrust and that's on the record. Its been well reported and accurately reported as to what happened so I invite you not to rely upon my word, just go out and read about what happened there.

I would like to think that we can reach some common understandings of what are essentially very important issues but in terms of the fundamentals of cap and trade, its very easy to say cap and trade is the way forward if you only imply it very narrowly to one sector with a cap that's so high as to be meaningless. There's some ways to go before we're actually at one with one another on this issue. Time will tell whether we get there but I made the invitation to Nick Smith recently. I didn't reject it.

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GARY TAYLOR
I think this is the point at which we're going to wrap because its 7.30, Nick Smith has got to catch a plane. I'm sorry but we could go on for quite some time. I think really from my point of view there's a very strong moral imperative around getting at least some multi party consensus around the core elements of policy to drive climate change and that core element, the key as Peter so eloquently said for us, is getting a price on carbon into the economy so business and people know how to behave and what behaviour changes are necessary to deal with this issue. So from the point of view of EDS and perhaps many of you, a bunch of Aucklanders, it would be very good to get the three of you at least into the same room, Chatham house rules, independent chair, soon, talking around the core ingredients of policy and I think Jeanette made a good point to me, you don't have to agree on everything, you can differentiate yourselves for the electorate around a bunch of stuff but its that core thing that the community and business I think are looking for to get in place and to get some certainty going forward. So with no further ado I'd like to ask you to join me in thanking our speakers for their contribution this evening and then we can move on into the lounge and have some more of Bell Gully's hospitality, so thanks for coming.

ENDS.

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20-D-02335 Appendix 1: document 8

20-D-02335 Excerpt of in-scope material

Document no.	Date	Title	In scope material	Context
8	2007	Meeting minutes. CLIMATE CHANGE	"*Possibility of a "carbon credit card" – shadow price, calculate carbon footprint on a daily basis. After 2 years or so begin to charge per unit".* Some content is provided towards the end of the meeting minutes summarising the discussion. *Summary themes:* *1. Present way of doing business is not effective ♣ Need financial incentives ♣ Need to restructure the way we do business* *2. Need to bring people in to it ♣ Increase awareness ♣ Ensure everyone in same boat and everyone involved ♣ Tangata Whenua c tical* *3. New Zealand has high chance of surviv ng in a changing planet if we make use of the opportunities and prepare for the risks*	Comment recorded from a public meeting in Nelson

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20-D-02335 Appendix 1: document 10

CC 2007-08/016

s 9(2)(a)

Dear s 9(2)(a)

Thank you for your email of 26 June 2007 regarding your proposal for a household emissions trading scheme and requesting the government's support.

As you probably know, the government is presently developing a New Zealand emissions trading scheme to cover all sectors and greenhouse gases. While no decisions have been made yet on the design of the scheme, it is likely that points of obligation for the scheme, (i.e. the direct participants who are responsible for meeting emission liabilities), will primari y be large 'upst eam' suppliers. Such suppliers would include fossil fuel refiners and importers.

I agree with you that it is important that end-consumers such as households change their consumption pa terns. Emissions trading schemes in use or under development internationally are largely based on upstream points of obligation. With an upstream approach, costs of emissions will be passed to end-consumers in the price of products, and will influence consumer choices.

However, 'downstream' points of obligation such as individuals and households are costly for the government to administer, and emissions are very difficult to measure accurately and apply to particular products. A 'downstream' scheme would be costly also for the participant, as most parties would lack the resources to be involved. Such costs, spread over many thousands of households, make such a scheme design unattractive for the government.

The development of the New Zealand emission trading scheme will require the development and publication of emission factors and other information that may be useful to the development of private voluntary schemes.

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The government will be making decisions soon on a New Zealand emissions trading scheme. Subject to those decisions, the government expects to engage with stakeholders on the possible design of the scheme in coming months. You may like to contribute to this process. Details of engagement will be available as they are announced on the Ministry for the Environment web site http://www.mfe.govt.nz/issues/climate/.

I wish you well with your proposal.

Yours sincerely

Hon David Parker
Minister Responsible for Climate Change Issues

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Hon James Shaw

Minister for Climate Change
Minister of Statistics
Associate Minister of Finance

Minita mō Te Rerekētanga o Te Āhuarangi
Minita Tatauranga
Hoa Minita Tahua Moni

20-M-01745

s 9(2)(a) [redacted]

28 September 2020

Tēnā koe s 9(2)

Thank you for your email of 8 September 2020 regarding a carbon emission credit card.

I have been encouraged to hear from many people who, like you, are thinking about how we can support New Zealand's transition to a low emissions and climate resilient future. I appreciate your sharing your thoughts and the Economist correspondence with me.

The primary difference between an individual emissions allowance and the New Zealand Emissions Trading Scheme (NZ ETS) is where the point of obligation falls.

The NZ ETS counts emissions as far up the supply chain as possible, balancing pricing a large volume of emissions with accuracy with low administrative and participation costs.

As the author in the Economist article indicates, a scheme of individual emissions allowances presents challenges with measurement and operational costs. These problems may be resolved in the future, but for now, the NZ ETS is the main pricing tool we have for incentivising emission reductions.

One theme you reiterate is the need for 'active participation' from individuals. I agree with this. We need to grow awareness of the emissions impact of individual behaviours and choices.

While NZ ETS costs are important for large industrial investment decisions, other tools are needed for households because NZ ETS costs and policies are not as visible at that level.

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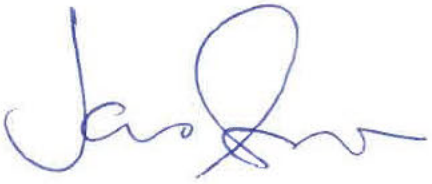
I expect public education and information to be an important part of the Government's emissions reduction plan next year.

Thank you for your email.

Nāku noa, nā,



Hon. James Shaw
Minister for Climate Change

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