Australia, the United States, and Global Warming

Attached is a letter that I received from Martin Parkinson, Secretary, Department of Climate Change, Government of Australia, and my draft response. Suggestions for any changes to this response, preferably specific, would be welcomed. The matters are equally relevant to the United States. They have global implications.

The situation is this: many Australian, United States, and other scientists, among those who are aware of the urgent need for actions to defuse the climate danger, are sorely disappointed in specific strategies for emission reductions that our governments are aiming toward. These directions seem to have been strongly influenced by special financial interests, rather than being designed in the best interests of the public and other species on the planet. It is not surprising that scientists have reacted with chagrin – my Sword of Damocles op-ed being a case in point.

On the other hand, the recently elected governments compare favorably with others of the past. The present governments are likely to be as amenable to reason as any that we will see soon, at least within the brief period during which we must move onto a different emissions pathway.

Still, we cannot let polite discourse cloud the fact that the cap-and-trade approach favored by governments and special interests does not have a snowballs chance in Hades of achieving a carbon reduction path consistent with the path dictated by science.

It seems that we need a three-point strategy:

(1) Open dialogue with governments re needed policy actions. We will not move rapidly to the era beyond fossil fuels (emissions) as long as (subsidized) fossil fuels are the cheapest energy. Myths about economically inefficient cap-and-trade must be exposed. And the public will not allow a sufficient carbon price unless the carbon fee is returned 100% to the public.

(2) Increased public pressure. Peaceful public protests are growing – they seem to be essential to counter the influence of special interests on policy-makers.

(3) The courts. They have a longer view and should recognize our legal obligation to preserve property belonging to future generations, under any reasonable common law. Founders of the American democracy considered this legal obligation to be “self-evident”, as do most cultures.

The letter from Secretary Parkinson is appreciated and provides an opportunity to engage in constructive discourse. Thus the attached draft response is intended to contribute to (1).

Thanks to Charles Komanoff, James Handley, Daniel Rosenblum, and Steven Stoft for providing large parts of this draft response – apologies to them for flaws in the present composition.

Jim Hansen

DRAFT Date of Draft: 24 April 2009

Hon. Martin Parkinson
Secretary
Department of Climate Change
Government of Australia

Re: Australia's Response to Climate Change

Dear Secretary Parkinson:

Thank you for your letter of 6 April, in which you provided reasoning behind the Carbon Pollution Reduction Scheme (CPRS) announced in your Government's White Paper,[1] including the emissions trading program to be implemented 1 July 2010.

The White Paper is forthright about the "need for action on climate change". The first section pulls no punches, stating:

> Carbon pollution is causing the world's climate to change, resulting in extreme weather, higher temperatures, more droughts, and rising sea levels.
>
> Eleven of the past 12 years rank among the 12 warmest years since records began and Australia had warmer-than-average mean annual temperatures for 16 of the past 18 years.
>
> As one of the hottest and driest continents on earth, Australia will be one of the nations hit hardest and fastest by climate change if we don't act now.

This kind of straight talk is admirable, as is the statement in your 6 April letter that "We strongly agree with you that climate change requires urgent and significant changes in human activity."

I am also encouraged by the policy proposed in the White Paper to return 100 percent of revenue from permit auctions to Australian households and businesses. Unless the tax is fully returned to the public, in a transparent fashion, they will not permit the carbon fee to rise to the needed level.

However, despite these laudable aspects, it must be pointed out that the emission targets outlined in your letter and the White Paper are inadequate to stabilize climate. Moreover, the plan to base the CPRS on a cap-and-trade approach is unlikely to meet even the goals that are stated.

Below I critique Australia's targets – but let me assure you that I am equally frank about plans of other nations, including my own. I also point out flaws of cap-and-trade below. I hope you will reconsider your plan – we cannot lose another decade to such a disastrously ineffectual approach.

[1] *Carbon Pollution Reduction Scheme: Australia's low pollution future, White Paper*, downloaded from http://www.climatechange.gov.au/whitepaper/report/pubs/pdf/V100eExecutiveSummary.pdf.

Australia's GHG Reduction Targets

You note that the Australian Government has committed to reducing 2020 greenhouse gas emissions by 5-15% from 2000 levels, which would be as much as a 41% reduction in per capita emission from 1990 levels. However, your assertion that these reductions are "on par with those countries that have also adopted or proposed long-term targets" is misleading.

Authoritative data show that *Australia's per capita emissions of carbon dioxide from fossil fuel combustion, although comparable to those in the United States and Canada, are twice as high as per capita emissions in Western Europe*. Here is a snapshot for 2005, the most recent year for this specific data compilation:

CO_2 Emissions from Fossil-Fuel Burning

Country	Tonnes per capita (2005)
Australia	4.95
Germany	2.60
France	1.69
Denmark	2.32
Spain	2.16

Source: National CO_2 Emissions from Fossil-Fuel Burning, Cement Manufacture, and Gas Flaring: 1751-2005, downloaded from http://cdiac.ornl.gov/ftp/trends/emissions/aus.dat (for Australia). For other countries shown, replace "aus" in link with "ger", "fra", "den" and "spa". Figures exclude bunker fuel (ocean-going ships).

These countries span a wide range of climate conditions, potential wind and solar resources, and use of nuclear energy. They all have robust per-capita incomes, high life expectancies, and desirable quality of life. The fact that per capita emissions in each country are roughly half of Australia's suggests that Australia's emission targets could be considerably more ambitious.

Moreover, none of the various nations' emission targets take into account the precipitous drop in economic activity, energy use, and GHG emissions from the deep worldwide recession. Available estimates suggest that the recession may eradicate about three years' emissions growth. Emission levels that had been expected in, say, 2010 won't be reached until 2013. That fact cries out for bettering prevailing targets.

Obviously, there is room for Australia to cut its emissions much more than planned. How? With policies similar to those being promoted elsewhere: mileage efficiency standards for vehicles; power-usage standards for appliances and electronics; retrofitting of residential and commercial buildings for efficient heating and cooling; urban revitalization promoting walkable and bikeable communities; land-use policies encouraging proximity over sprawl; and wholesale conversion of the electricity energy source from fossil fuels to carbon-free sources – including Australia's massive solar and wind resources.[2]

[2] Original and secondary sources describe Australia's wind and (of course) solar resources as "excellent by world standards." See, for example, http://en.wikipedia.org/wiki/Wind_power_in_Australia.

All of these measures will penetrate deeper, wider, and faster with carbon emissions pricing, as your letter recognizes. Indeed, if the carbon price is sufficient, the public will move rapidly to replace fossil habits and fossil infrastructure – once the tipping point is passed. With economic incentives, change will occur far more rapidly than is possible with mandated "goals" or "caps".

A rising carbon price is needed to transform consumer and life style choices, to make renewable energy and energy efficiency cheaper than fossil fuels, to spur business investment, innovation and associated economic activity, and to move the nation to the cleaner environment beyond the fossil fuel era. The carbon price will need to be significant, and the public and businesses must understand that it will increase in the future. It should be applied to all fossil fuels – oil, gas and coal – uniformly at the source (the first sale at the mine or port of entry).

Will the public accept a rising carbon fee. You bet – if the revenue is distributed 100% to the public. More than half of the public (those who do better than average in limiting their direct and indirect carbon emissions) will receive a dividend larger than the amount they pay in carbon fee via higher energy prices. The revenue should NOT go to the government to send to favored industries – in general governments are lousy investors.

Will the public just turn around and spend the dividend on the same inefficient vehicle, etc.? No, not if there are better alternatives and if the public knows the carbon price will continue to rise. And there will be plenty of innovators developing alternatives. Objections will come mainly from special interests, those benefitting from business-as-usual – you will recognize their lobbyists from their alligator shoes.

As a U.S. citizen, I am well aware that implementing such policies is easier said than done. My country's per capita CO_2 emissions stood at 5.32 tonnes in 2005,[3] about 10% greater than yours. Marshaling public opinion and political will is a tremendous task, given the forces aligned for business-as-usual. In Washington there are four energy lobbyists for every Congress-person.

Political leadership is desperately needed. It is easiest to give in to business-as-usual. That was the approach to the automobile industry by politicians in the United States, giving in to industry lobbyists. It cost our country world leadership in that industry. That industry is a pittance, compared with the stakes with global climate. We must recognize our fiduciary responsibility, if not our moral obligation, to our children and grandchildren. And humans are but one of millions of species that will be affected by our choice to take, or not to take, needed actions.

Cap-and-Trade: A Circuitous, Ineffectual, Inefficient Path to a Carbon Price

I'm gratified to read in your letter that "The Australian Government agrees that a rising forward carbon price is an essential part of effective and efficient national and global responses to climate change." But you go on to state:

[3] CDIAC, http://cdiac.ornl.gov/ftp/trends/emissions/usa.dat.

> We do not accept … that a carbon tax will be the best mechanism to deliver such a price… [W]e consider that a cap and trade scheme [and] well designed quantity-based approaches have some significant advantages over price-based approaches.

First, let us level the terminology. If "fee and dividend" is to be called "tax and dividend", then the pseudonym "cap and trade" must be replaced by "tax and trade". One is no more a tax than the other – they both raise the price of energy for the consumer.

The consumer does not directly pay any tax or fee in the "fee and dividend" – the fee is paid at the fossil fuel mine or port of entry. It is transparent, uniform, honest, and fair. It is a single number per tonne of carbon. No large bureaucracy is needed, no traders, speculators, gamblers.

Please let me address specific points you raise, which in fact strongly disfavor cap-and-trade:

On Certainty. You note that "robust quantity-based approaches can achieve specified emissions reductions with a high degree of certainty" and "quantity of emissions reduction will be uncertain under price-based approaches." These points beg the questions: "Is year-to-year quantity uncertainty intolerable?" and "Will cap and trade be robust?"

In fact, uncertainty is inevitable with either approach. Moreover, our scientific knowledge and our political wisdom will likely improve over the next 40 years. So adaptability of present law is actually desirable.

Cap and trade is not robust. It has a great number of flaws, which I am sure you will agree should not be ignored in our analyses.

1. Realistic caps are incomplete and do not control what matters – <u>total</u> emissions.
2. Offsets are usually allowed and often poorly guaranteed, creating more uncertainty.
3. As with any law, caps can and will be changed, many times, before 2050.
4. National caps have been and are widely rejected, so the global cap will be far too high.
5. When caps are accepted, they are often set too high – as happened, e.g., with Russia.
6. If a complete set of tight caps were achieved, global permit trading would likely result in a Gresham's-Law effect – "bad money drives out good." Some countries will issue too many permits or fail to enforce requirements. These permits, being cheapest, will find their way into the world market and undermine the world cap.
7. Caps will be extremely hard to enforce because they must be set relative to business as usual, which cannot be predicted with any accuracy. (China's BAU emissions rose 27% from 1990 to 2000, but will rise more than 100% from 2000 to 2010.) By claiming a mistake in estimating BAU, a country can easily refuse to meet its cap. Canada, a highly respected country, is now taking advantage of this.

The view that we will have a "robust" cap is an illusion based on looking at rules for an ideal cap instead of the politics of real caps. Problem #4 above will cause trouble, e.g., because permit trading has characteristics that will likely provoke popular backlash. For example:

1. Consumers may discover, as they did in Europe, that they are charged for "free permits."
2. Some permit traders will become millionaires by speculating on carbon prices – this money does not come out of thin air – it comes out of consumer pockets.

3. An effective cap will eventually cause a high implicit tax rate. As Nordhaus (see below) notes, volatility of this tax may become "extremely unpopular with market participants."

Such problems would cause repeated changes, or abandonment, of a global cap-and-trade system. If that system attains only limited coverage, as is now the case, worse problems will arise in the global offset markets. For these reasons, and because they believe a cap-and-trade approach will continue to stymie international negotiations, some of our top economist from across the political spectrum vigorously oppose cap and trade. Notable among these are William D. Nordhaus, Joseph E. Stiglitz (*Making Globalization Work*, Chp. 6), and N. Gregory Mankiw.

On Permit Price Volatility. I am surprised by your first point about prices. You say, [Emission permits] "will generally provide greater security and improved risk management for firms and market participants than a tax or administratively set prices."

Actually, volatile permit prices are almost universally considered to be the chief deficiency of cap and trade relative to a carbon tax. Nordhaus, in *A Question of Balance* (2008), examines the volatility of SO_2 permit prices in the United States and finds they have been twice as volatile as the S&P 500 index and nearly as volatile as oil prices. He then concludes (p. 155):

> Such rapid fluctuations are costly and undesirable, particularly for an input such as carbon whose aggregate costs might be as great as those of petroleum in the coming decades. An interesting analogue occurred in the United States during the monetarist experiment of 1979-1982, when the Federal Reserve targeted quantities (monetary aggregates) rather than prices (interest rates). During that period, interest rates were extremely volatile. In part because of this increased volatility, the Fed changed back to a price-type approach after a short period of experimentation. This experience suggests that a regime of strict quantity limits might have *major disruptive effects on energy markets and on investment planning, as well as on distribution of income across countries, inflation rates, energy prices, and import and export values. Quantity limits might consequently become extremely unpopular with market participants and economic policy makers.* [emphasis added]

We now have data on EAU futures that were unavailable to Nordhaus when he made his study of volatility. Using futures with settlement date December 2012, which now have nearly a four year time series, we find they are 3.5 times as volatile as the S&P 500, with the phase II period (starting Jan. 1, 2008) being slightly more volatile than the earlier period.

On Price Discovery. The hope that futures and options markets will "reveal" future carbon prices under a cap and trade system is a case of whistling past the graveyard – with the gravestones bearing names like "securitization," "derivatives," and "credit-default swaps" that have brought the global economy to the brink of ruin. It would be less than prudent to give license to institutions in Australia and elsewhere to construct new, potentially toxic financial instruments, particularly ones that will help decide the fate of essential investment in zero- and low-carbon technologies.[4] I also have to question the capacity of millions of Australian

[4] I commend the recent (March 2009) report by Friends of the Earth, USA, *Subprime Carbon? Re-thinking the World's Largest New Derivatives Market*, http://www.foe.org/subprimecarbon, for clearly and soberly "connecting the dots" between carbon emission permit trading and carbon derivatives.

households and small-business owners to employ price discovery to guide their decisions to purchase low-carbon cars and houses and to move generally to climate-sustainable lifestyles. Why not just give them the future carbon price straight-up?

On Progressively Rising Tax Rates. You note that you are "unaware of instances where countries have committed to, and delivered, a program of progressively rising tax rates." Pollution taxes have rarely been tried under the traditional mindset favoring command-and-control regulations. But two examples of progressively rising pollution taxes come to mind: the tax on chlorofluorocarbons and other ozone-destroying chemicals implemented by the United States beginning on Jan. 1, 1990 to support the Montreal Protocol[5]; and the carbon tax that took effect in British Columbia, Canada's third largest province and roughly the same population as your state of Victoria, last July 1.[6] Your concern that "a price-based approach [such as a carbon tax] may not be capable of achieving the political mandate required to deliver the ambitious emissions reductions called for by the science, over the long run," surely depends upon whether 100% of the carbon fee is returned to the public. Certainly, the nation should and will have the option of deciding whether the carbon fee will continue and how fast it will rise. My guess is that, as they see the benefits and consequences, and as many receive more in dividends than they pay in increased fossil energy cost, they will encourage continuation of this simple, honest, transparent system. On the contrary, with cap and trade (tax and trade) the first time that problems associated with "securitization," "derivatives," "credit-default swaps", and speculator millionaires hits the media, the politicians in office will be running for the hills as fast as their legs can carry them.

On implementation. The carbon tax in British Columbia took only months from announcement, in February 2008, to implementation, in June 2008. Cap and trade schemes have taken an order of magnitude longer to craft and introduce.[7] The difference arises from the complexity of cap and trade vs. the simplicity of a carbon tax or fee. It is this contrast that helps account for the shift in opinion that has become palpable in the U.S. business community, the political commentariat and, now, in the U.S. Congress.

The dividend, which you presumably would choose to give to all adult legal residents, can be implemented just as quickly, delivered electronically to bank accounts every month. It could be added to debit cards of anybody who does not have a bank account.

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[5] According to a retrospective analysis by the Arthur D. Little consulting firm for the Alliance for Responsible Atmospheric Policy, the tax on CFC's began in 1990 at $3.00/ODP-kg (ODP denotes ozone-depletion units) and automatically increased each year by $1.00/ODP-kg, finally reaching $18.80/ODP-kg in 2002. See http://www.arap.org/adlittle/2.html.

[6] The British Columbia carbon tax began at $10 per metric ton of carbon dioxide on 1 July 2008 and is scheduled to increase annually by $5/tonne, reaching $30/tonne on 1 July 2012.

[7] A case in point: "RGGI," the most ambitious cap and trade scheme in the U.S., the northeast states' Regional Gas Greenhouse Initiative, was announced in 2003 and started up in 2008. It is minimalist and covers only electricity.

In closing, I note the recent comment of New York Times columnist Thomas L. Friedman:

> [S]simplicity matters. Americans will be willing to pay a tax for their children to be less threatened, breathe cleaner air and live in a more sustainable world with a stronger America. They are much less likely to support a firm in London trading offsets from an electric bill in Boston with a derivatives firm in New York in order to help fund an aluminum smelter in Beijing, which is what cap-and-trade is all about. People won't support what they can't explain.[8]

I believe Friedman is right about Americans and that the same applies to Australians. People are hungry not just for a sustainable climate, and cleaner air and water, but for political openness and honesty. They want their leaders to level with them. I am confident, given the recent leadership of the Australian Government's on climate issues, that you will do precisely that in the next steps of adopting suitable targets and selecting an optimal path to achieve them.

Thank you for your openness to my information and point of view. I look forward to your reply and your continuing leadership.

Sincerely,

James E. Hansen

[8] Thomas L. Friedman, "Show Me the Ball," The New York Times, http://www.nytimes.com/2009/04/08/opinion/08friedman.html.

Australian Government
Department of Climate Change

Office of the Secretary

6 April 2009

Professor James Hansen
Columbia University
750 Armstrong Hall
2880 Broadway
New York, NY 10025 USA

Dear Professor Hansen

AUSTRALIA'S RESPONSE TO CLIMATE CHANGE

I have noted with interest your open letter of 29 December 2008 to President Obama regarding policy proposals to combat the global threat of climate change, and your subsequent comments reported in the Observer on 15 February 2009. In light of the significance of the points you have raised, I am taking the opportunity to provide some observations from an Australian policy perspective.

I would first like to applaud your determination to ensure climate policy is informed by the science.

The Australian Government is committed to addressing the challenge of climate change nationally and to contributing to a global solution, and has publicly stated that fair and effective global action to stabilise greenhouse gas concentrations at 450ppm or lower is in our national interest. We strongly agree with you that climate change requires urgent and significant changes in human activity, and support the general goals that underlie your open letter. This is why the Australian Government is putting a price on carbon and committing to significant reductions in Australia's greenhouse gas emissions.

In your letter, you stress the importance of introducing a rising carbon price to drive the necessary reductions in emissions; call for a moratorium on new, and the phase out of existing, coal-fired electricity generation that does not capture and store carbon dioxide; and emphasise the importance of research into next generation energy technologies.

The Australian Government agrees that a rising forward carbon price is an essential part of effective and efficient national and global responses to climate change. We do not accept, however, that a carbon tax will be the best mechanism to deliver such a price in all countries and circumstances. In particular, we consider that a cap and trade scheme with substantial auctioning of permits delivers all the benefits of the 'tax and 100% dividend' approach you outline and, more generally, that well designed quantity-based approaches have some significant advantages over price-based approaches. For example, robust quantity-based approaches can achieve specified emissions reductions with a high degree of certainty, whereas the quantity of emissions reduction will be uncertain under price-based approaches. Quantity-based approaches that involve the creation of new property rights (emission permits) will generally provide greater security and improved risk management for firms and market participants than a tax or administratively set prices. They also allow for price

discovery and are able to signal expected medium and long-term carbon prices (such as through futures and options markets). These expectations about future prices are central to current investment decisions.

In contrast, I am unaware of instances where countries have committed to, and delivered, a program of progressively rising tax rates. Finally, it is not clear that a price-based approach is more capable of achieving the political mandate required to deliver the ambitious emissions reductions called for by the science, over the long run. Indeed, the need to establish new carbon tax rates, possibly annually, is likely to reduce business certainty about the future direction of carbon prices, thereby inhibiting desired behavioural responses.

The Australian Government has announced that the Carbon Pollution Reduction Scheme (CPRS), an emissions trading scheme, will form the centrepiece of its domestic emissions reduction policy. This is a historic reform, which will create a visible, rising carbon price for Australia, driving emissions reductions and transforming the Australian economy over time. As part of this policy, announced in the CPRS White Paper on 15 December 2008, the Australian Government has chosen to return 100 per cent of auction permit revenues to Australian households and businesses through a series of targeted initiatives designed to protect consumers – especially low and medium income households – and to assist businesses with the transition to a low emissions economy.

On carbon capture and storage, the Australian Government agrees that achieving ambitious reductions in global emissions will require a transformation of the global energy system, including a rapid shift away from construction of coal-fired electricity generation plants without carbon capture and storage. Consistent with this, the Australian Government's modelling indicates that the expected carbon price arising under the CPRS is likely to result in no new coal-fired electricity generation plants being built in Australia without carbon capture and storage once the CPRS is in place.

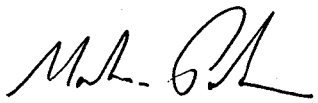
On energy technology research, the Australian Government agrees with you that ambitious global action on climate change requires urgent and substantial support for low or zero emissions energy technologies that move beyond incremental improvements. The Australian Government has committed over $1.5 billion to support research, development and deployment of renewable energy and effective carbon capture and storage technologies. This includes $100 million annually to the establishment of a Global Carbon Capture and Storage Institute to support the development and deployment of large-scale CCS technologies. We are also supporting renewable energy through a new stronger national Renewable Energy Target, which will see 20 per cent of Australia's total electricity needs in 2020 provided by renewable generation.

In conclusion, I note that the Australian Government has announced a mid-term target range of a 5-15 per cent reduction in emissions from 2000 levels by 2020. This represents a reduction of up to 22 percentage points from our agreed international commitment for the Kyoto period (2008-2012) and constitutes a reduction of up to 41 per cent in the per capita emissions of every Australian relative to 1990 levels, and is on par with those countries that have also adopted or proposed long-term targets. While we consider this a serious and credible contribution to a long-term global solution, we agree that the science calls for deeper cuts over time. Australia stands ready to increase its efforts as part of a fair and effective global agreement, and Prime Minister Rudd has indicated our willingness to

reconsider the existing 2050 target of a 60 percent reduction from 2000 levels, if this is required for us to play our full and fair part.

Thank you, on behalf of the Australian Government, for your important contributions to ensuring that the world responds to the challenge of climate change.

Yours sincerely



Martin Parkinson
Secretary