

Least cost emission reductions

There seems plenty of evidence that human induced climate change is occurring. If the concentration of greenhouse gases in the atmosphere continues to increase for the next few decades it seems highly likely there will be significant changes to climate, sea level, and many other features. Those changes are expected to bring more global costs than benefits and for many low lying regions the impacts are likely to be catastrophic.

I recently tried to persuade some colleagues that human induced climate change is no longer controversial, and it is *response to climate change* where there is heated debate. My colleagues judged that statement was far too rash for public consumption and it was deleted from the document we were working on. There is plenty of debate over response to climate change, and particularly over attempts to achieve emissions reductions, and that is not surprising in New Zealand for few countries have made as big a mess of response to climate change as has New Zealand. For a decade political parties competed to offer ever grander emission reduction targets until New Zealand's representatives agreed at Kyoto that our emissions during the 2008-2012 commitment period would not exceed 5 times our 1990 level emissions. In 2008 the folly of that decision is starkly obvious as New Zealand's emissions are running 25+% above 1990 levels and there is little prospect of any meaningful reduction occurring before 2012. If New Zealand honours its Kyoto commitment, purchase of carbon credits may cost more than \$1 billion.

The actions that nations choose to take in response to climate change and to meet Kyoto or subsequent commitments differ in their costs. The costs of climate change response can be compared to the benefits expected to flow from those actions. Responding to climate change seems certain to impose costs on nations as soon as their actions commence. A nation taking strong early action to reduce greenhouse gas emissions needs to consider the benefits and the costs from those actions. New Zealand may be less at risk from climate change than most countries and may benefit only slightly from climate change policies introduced here and in other countries.

A crucial factor influencing the benefit cost ratio for climate change responses is the ease with which nations can reduce or offset their greenhouse gas emissions. New Zealand is heavily reliant on transport systems, agriculture and renewable energy sources. Improvements in energy efficiency, changes to farming and processing practices, more use of renewable energy (and less use of coal and gas), more carbon sequestration in growing forests, use of cement extenders or fillers in cement manufacturing, new cement manufacturing factories or changes in many other production systems are all possible with appropriate investments. Payoff from those actions will bring some local benefit - reduced energy costs, maybe reduced production costs - and global benefits of reduced climate change some years hence and stretching for decades, even centuries into the future.

Choice of discount rate is a key factor influencing whether the present value of the benefits from lessened climate change will exceed the present value of the costs of halting or reducing the rate of climate change. There is no consensus within economics over the appropriate discount rate to use in evaluation of long term environmental projects (Weitzman 2007). But a small country that is heavily reliant on international borrowing, and has a volatile exchange rate, does not have a low discount rate. In summary, strong action within New Zealand responding to climate change will bring more costs than benefits. Powerful arguments need to be advanced why New Zealand should agree to a stringent post 2012 emissions target.

Whatever the climate change targets that are established and pursued, an issue for nations and for the global community to focus on is can least cost ways to achieve the chosen emissions target be identified and employed? Even if there is continuing debate over the benefits to New Zealand and to the global community of pursuing emissions reduction target surely it's rational to pursue a target using the most cost effective ways available.

Which policies or incentives are needed to ensure least cost emissions reduction or sequestration occurs? Widely and consistently applied charges for greenhouse gas emissions, and payments for greenhouse gas sequestration, will provide incentive to search for least cost ways to reduce or sequester emissions. Negotiators striving to develop post 2012 climate change targets and mechanisms need to be single minded in their pursuit of that goal.

The Kyoto Accord was cognizant of this point, and beyond the borders of Annex I countries the Clean Development Mechanism provides a means to pursue low cost climate change actions. But the remarkable divergence of petrol prices around the world at mid-year 2008 (6 cents per litre in Venezuela, 92 cents in China, \$1.25 in USA, \$2.01 in New Zealand, \$2.89 in Germany, \$6.08 per litre in Sierra Leone), the absence of payments for carbon sequestration in tropical forests, the opposition to inclusion of the largest emitters in climate change action, and the absence of taxes on aviation fuel, all illustrate just how far away we are from policies and signals that will deliver least cost responses to climate change.

Reference

Weitzman, M. 2007. The Stern Review of the economics of climate change. <http://www.economics.harvard.edu/faculty/weitzman/files/JELSternReport.pdf>