

Tena koutou, tena koutou, tena koutou katoa (greetings, greetings, greetings everyone) – a traditional Maori greeting to start a public talk in New Zealand. Maori traditions enrich New Zealand. New Zealanders are thoughtful, in touch with nature, and their pace is not frantic.

When I was asked to give talks in New Zealand about climate change, I realized that carbon emissions of New Zealand (population 4 million) are small. Even per capita fossil fuel carbon emissions, 2 tC/year (tons per person per year), are small compared to the United States (almost 5 tC/year). My rationale for accepting was that "...there is a chance that small nations could play a key role by standing up and telling the truth about the (climate) situation."

We are getting closer to the time when a developed nation will stand up and tell the truth. Reaching that point requires first, within that nation, a rational conversation.

New Zealand has impressive potential to carry out such a conversation. Discussions are civil, politics is not dysfunctional, 3rd parties can participate (e.g., the Green party now receives more than 5 percent of the vote, so they are given a proportionate number of seats in parliament).

New Zealand situation re carbon emissions

About 70 percent of New Zealand's electricity is renewable (mostly hydro, with some geothermal, wind). New Zealand does not need nuclear power for nearly carbon-free electricity.

New Zealand's fossil fuel carbon emissions are rising (Figure 1), mainly because of increasing automobile traffic and absence of any fuel efficiency standards for vehicles.

Politicians say appropriate words about goals, e.g., "50 by 50", promising to reduce emissions by half by 2050. But reality is different. Government figures show declining total emissions only because of claimed new forest plantings, which they will harvest later.

Science demands fossil fuel emissions be phased out, if climate is to be stabilized. Major reforestation and improved soil management will be needed to avoid climate tipping points – but such actions are needed additional to fossil fuel phasedown, not as an alternative.

[We scientists deserve some blame for government efforts to use "offsets" to avoid fossil fuel limits. Fossil fuel CO₂ stays in surface reservoirs for millennia. We are nearing the limit for how much carbon can be put there. We should not have acquiesced to the "CO₂ equivalence" concept that was adopted in the Kyoto Protocol. There is no equivalence to fossil fuel CO₂.]

New Zealand recently initiated an Emissions Trading Scheme now covering several sectors (energy, industrial processes and transport). Scheme is the right word. As with most trading schemes, intentions were good – but special interests got involved. The Emissions Trading Scheme is not driving down emissions at a rapid rate. Indeed, actual fossil fuel emissions are projected to rise; it may even include some free emissions for new lignite projects!

[What is needed is a simple, transparent rising carbon fee (tax). Until there is a global agreement, border adjustments could be permitted to avoid unfair impacts on local industry.]

New Zealand has a massive deposit of low-grade lignite coal. Analogous to tar sands, it is among the dirtiest of fossil fuels; on per capita basis New Zealand would be a major source. New Zealand has the second largest coal deposits per capita in the world, after Australia.

Tour highlights

I met Mike Dunbar, a farmer in the lignite region, who showed me the scarred landscape where initial lignite extraction is occurring. Mike refuses to sell his property for lignite development, attempting to block expansion of that activity, analogous to Larry Gibson¹ refusing to sell his property on Kayford Mountain, West Virginia, to stem mountaintop removal there.

¹ J. Hansen, Chapter 11, Storms of My Grandchildren, Bloomsbury, 320 pp., 2011.

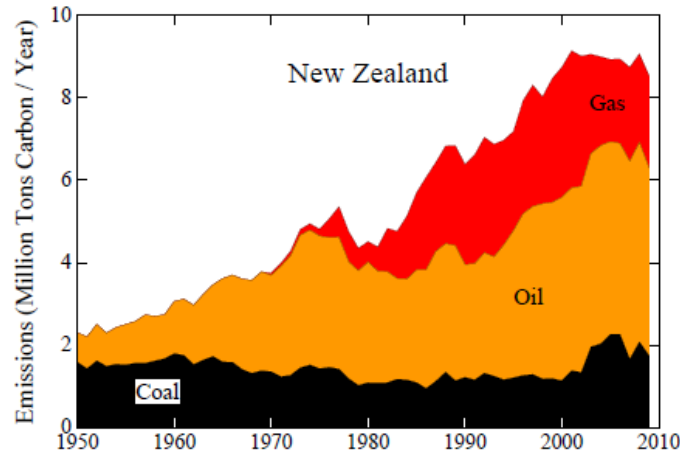


Figure 1. New Zealand fossil fuel emissions in millions of metric tons of carbon per year.

One of my public talks was in Gore, in the region anticipating economic expansion from lignite mining. It drew a large crowd that might have been expected to be hostile.

Anniek sat near the back, next to a local farmer, who, not knowing she was related to me, expressed misgivings about environmentalism and the notion that humans were altering climate. Questions from the audience included a few of the usual contrarian statements, which could be readily addressed. At the end, when Anniek queried the farmer re his opinion, he was thoughtful and seemed more open-minded about whether lignite development was a good idea.

The reception of the scientific story was in striking contrast to the time I tried to speak in West Virginia, near Coal River Mountain. There it was impossible to be heard because of shouting miners and revved up motorcycles. As we walked to the coal company offices to deliver a petition, Judy Bonds was knocked down by the heavy forearm of a miner's wife.

The principal difference between West Virginia and Gore, it seemed to me, was that the coal company in West Virginia encouraged the (small number of) miners' behavior and opposed any rational discussion about whether the region was better off with or without the coal mining. The coal company (Massey) CEO refused to participate in an exchange with me in a school, where I would make a public presentation of the science followed by equal time for him.

In contrast, Don Elder, the CEO of Solid Energy in New Zealand, willingly participated in a climate conference in Wellington where his views were not likely to be favored. Although he later mischaracterized my position (asserting that I said lignite development was o.k. if the CO₂ was captured), that misrepresentation was my fault for not choosing my words carefully. In reality, it is well understood that the lignite project would be highly carbon-intensive.

Another difference with West Virginia is that the latter region has long been heavily dependent on coal mining. Gore has yet to start, so nobody actually faces losing their job.

Elder, obviously a highly capable leader, left the impression that he could just as well move his company into renewable energies, if government provided that direction (Solid Energy is 100 percent government owned). But without a carbon price or government direction, lignite provides the best profit potential for business, especially with planned government subsidies.

The heart of the matter

New Zealand is a microcosm of the global situation re climate change, as illustrated by a question from a gentleman farmer after a dinner talk the same day as my public talk in Gore. The audience, including landowners expecting to benefit from lignite development, was polite. The question: his 17-year-old daughter wanted to know why she should have to give up the wealth from coal development, given that New Zealand produces little global CO₂ emissions and other countries were continuing to increase their emissions.

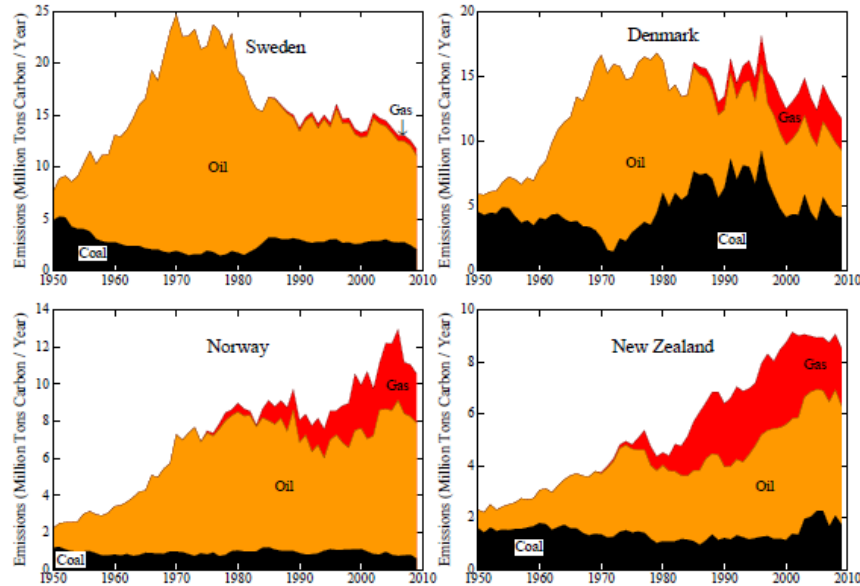


Figure 2. Fossil fuel carbon emissions of four countries through 2009 (megatons C/year). (Data source: Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory).

That question gets close to the heart of the matter, and shows why the solution is difficult. As long as fossil fuels are the cheapest energy, they will continue to be dug up and burned. It is as sure as the law of gravity. But fossil fuels are cheapest only because they are subsidized, directly and indirectly, and do not pay their costs to society. Costs include air and water pollution and all the present and future costs due to human-made climate change.

Bravery of Larry Gibson and Mike Dunbar will not stop fossil fuel use. Nor will the Maori boats of Te Whanau Apanui that temporarily occupied their long-held fishing grounds, trying to block deep ocean oil exploration. This fact does not diminish such actions, or efforts to block tar sands pipelines, long-wall mining, and other destructive practices. Indeed, such holding actions are effective, if they are accompanied by a rising price on carbon emissions.

The essential solution is a rising price on carbon that is fair from the standpoint of society. It should start moderate and rise over time, allowing time for life style changes and development of low-carbon innovations. Most (low energy quality) lignite, coal requiring mountaintop removal, and oil from the deepest ocean would be left in the ground. The 17-year old daughter may miss out on a bonanza, but such matters should be based on what is best for all. There are other opportunities for individuals.

A public conversation regarding energy choices is needed. The big question is not the merits/demerits of alternative energies (all have detractors) and energy efficiency. Rather the question is how to achieve an appropriate rising price on carbon emissions designed in the public's best interest. The economically efficient approach is an across-the-board fee on carbon-based fuels, collected from the fossil fuel companies at the domestic mine or port-of-entry.

Assessment of the economics, arguments for and against a rising carbon price, are given in the book "The Case for a Carbon Tax" (Hsu, 2011). An across-the-board price on all fossil fuel CO₂ emissions emerges as the simplest, easiest, fastest and most effective way to phase down carbon emissions, and this approach presents fewer obstacles to international agreement.

Public interest must lead the energy/climate conversation. In that case, the result will not be a complex cap-and-trade-with-offsets approach, fluctuating energy prices, favors to special interests, and resultant small carbon reductions. More likely is a simple, transparent, gradually rising fee on carbon emissions collected from fossil fuel companies, with proceeds distributed to the public (cf. Jim DiPeso summary <http://www.rep.org/opinions/weblog/weblog10-10-11.html>).

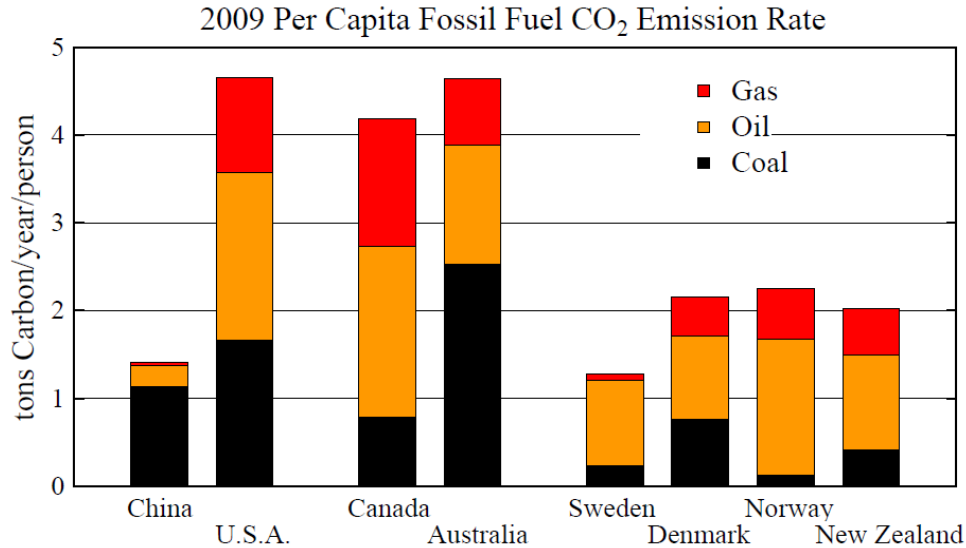


Figure 3. Per capita fossil fuel carbon emissions of eight countries in 2009 (tons C/year).

Why New Zealand?

Is it possible that New Zealand might be the developed country that I was searching for in "Storms", i.e., a country that could have a conversation and stand up to tell the truth: that fossil fuel addiction can only be cured via an honest rising price on carbon?

I previously focused on Nordic countries as perhaps the best hope. Given that I am returning to Norway this week, albeit for a scientific conference, this is a good time to compare several small nations with well-educated nominally "green" populations.

Figure 2 shows fossil fuel carbon emissions of Sweden, Denmark, Norway and New Zealand (note that vertical scales differ). Sweden and Denmark have done good jobs of reducing emissions in recent decades.

[Decreased emissions in the last year or two in Figure 2, which extends through 2009, are due at least in part to the global economic downturn and may be temporary. Norway's 2010 fossil fuel emissions, for example, are reported to have increased about 5 percent over 2009.]

Figure 3 is more revealing. It shows fossil fuel emissions per capita in countries in three categories: Big emitters (China, United States), "quarry" countries (Canada, Australia), and the four small nominally-green countries. This figure is a good summary of the current situation, but note that fossil fuel emissions arising in the production of items sold internationally are blamed on the producer nations (commonly China), not the consuming nation.

Back to the question: will any nation stand up and tell the truth about the climate situation and the need for urgent action, specifically a rising carbon price?

One problem with Norway is that they have the 17-year-old daughter problem in spades. Norway is getting rich by selling fossil fuels. They are not wasting the money. A lot of it is put in funds for the benefit of young people and future generations. That's good for their 17-year-old daughters, as long as they don't care about the planet.

Norway (state-controlled Statoil!) is financing development of tar sands in the quarry country, Canada. That makes Norwegians, from the viewpoint of native Americans in western Canada, not much different than the villains in Avatar.

Norway's conscience could begin to affect Statoil and force them out of the tar sands – a powerful signal to Canada, but only a first step. Another country would likely pick up the investment. It's the law of gravity. As long as fossil fuels are subsidized and are allowed to pass

on their environmental and climate costs to the public, even the dirtiest, most difficult to reach fossil fuels will be developed. And everyone's children and grandchildren will be screwed.

New Zealand seems to be a good candidate for an honest conversation. But it won't be easy. Look at neighboring Australia. Suggestions of a carbon tax there have brought out all the fire-power that the fossil fuel interests can muster – orders of magnitude more than that of scientists, environmentalists, or public concerned about their children. Look for the same in New Zealand. Lord Monckton may be on a plane already.

Australia is important, but, unfortunately, seems to be headed down a dark road. Prime Minister Julia Gillard took a principled position, calling for a carbon tax, but made the mistake of listening to political advisers. Result: attempt at same deception of the public as recommended by big environmental groups in Washington (who have been there too long, organizations that need annual large-scale donations) – pretend that phasedown of fossil fuel addiction can be achieved without households noticing much, by means of a tricky emissions trading scheme.

The public is not a bunch of dummies. They can take the truth. They can also smell a scheme, politics-as-usual. Put a flat rising fee on carbon. It will affect consumers and gradually change lifestyles. But give the collected money to the public in an honest transparent monthly dividend. People with lavish life styles will pay more in increased energy costs than they get in their dividend. But the public (and the business community) will know exactly what the score is, and they will see that their personal decisions make a difference.

The problem is that the money collected in the carbon tax is not distributed electronically to the public as monthly dividends. The last thing the public needs is politicians deciding how to invest their money. Energy efficiency and clean energies do not need subsidies – they need a fair, rising price on dirty energy. Let the public decide how to use their money. Those paying attention to energy use will come out ahead – everyone will benefit by initiating the policy direction that is essential to avoid the climate chaos already lapping at Australia's shores.²

Below is a letter written to Prime Minister Key while I was in New Zealand.

Dear Prime Minister Key,

Encouraged by youth of New Zealand, especially members of the organization 350.org, I write this open letter to inform you of recent advances in understanding of climate change, consequences for young people and nature, and implications for government policies.

I recognize that New Zealanders, blessed with a land of rare beauty, are exemplary in their environmental awareness. Also New Zealand contributes relatively little to carbon emissions

² Note to the people who send me messages (SOMETIMES SHOUTING IN ALL CAPS) demanding that I stop wasting THEIR MONEY and get out of the government: When I was in New Zealand I was on vacation, using up time accumulated years ago when I seldom took vacation. By taking the New Zealand vacation I am reducing taxpayers' costs, because I would otherwise be paid (when I retire) a lump sum for the vacation days that I did not use. Your blood pressure might come down a notch further if you saw the nature of the "vacation": slave-driver Jeanette Fitzsimons unceremoniously routing me out of bed at 6 or 7 AM every day to get moving to the next town – not exactly a case of sipping pina colada on a beach.

BTW, do you really believe that scientists make up or exaggerate global warming to get research funds? Our salaries do not depend on how much research the government funds. Government scientists get paid for working 40 hours a week, regardless of how long they work. My wife claims it is about 90 hours a week, but I say about 80. If you succeed in getting the government to cut back on science, because you don't like the results, the main effect will be erosion of our competitiveness relative to other nations. Your hounding of scientists does not bother me, but it may discourage young people from entering the profession, contributing to a national spiral into second or third rate technical and economic status. Perhaps, instead of questioning the motives of scientists, you should turn around and check the interests (motives) of the people who have pushed you to become so agitated.

that drive climate change. Per capita fossil fuel emissions from New Zealand are just over 2 tons of carbon per year, while in my country fossil fuel carbon emissions are about 5 tons per person.

However, we are all on the same boat. New Zealand youth, future generations, and all species in your country will be affected by global climate change, as will people and species in all nations.

New Zealand's actions affecting climate change are important. Your leadership in helping the public understand the facts and the merits of actions to ameliorate climate change will be important, as will New Zealand's voice in support of effective international actions.

The fact is that we, the older generation, are on the verge of handing young people a dynamically changing climate out of their control, with major consequences for humanity and nature. A path to a healthy, natural, prosperous future is still possible, but not if business-as-usual continues.

The state of Earth's climate is summarized in the attached paper, whose authorship includes leading world scientists in relevant fields. The bottom line is that Earth is out of energy balance, more energy coming in than going out. Thus more climate change is "in the pipeline".

Failure to address emissions of carbon dioxide, the main cause of human-made climate change, will produce increased regional climate extremes, as seen in Australia during the past few years. But young people, quite appropriately, are concerned especially that continued emissions will drive the climate system past tipping points with irreversible consequences during their lifetimes.

Shifting of climate zones accompanying business-as-usual emissions are expected to commit at least 20 percent of the species on our planet to extermination – possibly 40 percent or more. Extermination of species would be irreversible, leaving a more desolate planet for young people.

Sea level rise is a second irreversible consequence of global warming. Some sea level rise is now inevitable, but with phase down of fossil fuel use it may be kept to a level measured in a few tens of centimeters. Business-as-usual is expected to cause sea level rise exceeding a meter this century and to set ice sheet disintegration in motion guaranteeing multi-meter sea level rise.

Prompt actions are needed to avoid these large effects. Phase-out of coal emissions by 2030 is the principal requirement. Also unconventional fossil fuels, such as tar sands, must be left in the ground. These conditions, plus improved agricultural practices and reforestation of lands that are not effective for food production, could stabilize climate.

Implications for New Zealand are clear.

First, New Zealand should leave the massive deposits of lignite coal in the ground, instead developing its natural bounty of renewable energies and energy efficiency. If, instead, development of such coal resources proceeds, New Zealand's portion of resulting species extermination estimated by biological experts would be well over 1000 species. Most New Zealanders, I suspect, would not want to make such 'contributions' to global change.

Second, New Zealand should lend its voice to the cause of moving the global community onto a path leading to a healthy, natural, prosperous future. That path requires a flat rising carbon fee collected from fossil fuel companies domestically, with the funds distributed uniformly to citizens, thus moving the world toward carbon-free energies of the future.

Prime Minister Key, the youth of New Zealand are asking you to consider their concerns and exercise your leadership on behalf of their future, indeed on behalf of humankind and nature.

With all best wishes, James E. Hansen, Adjunct Professor, Columbia University Earth Institute