Climate change – New Zealand and International Response

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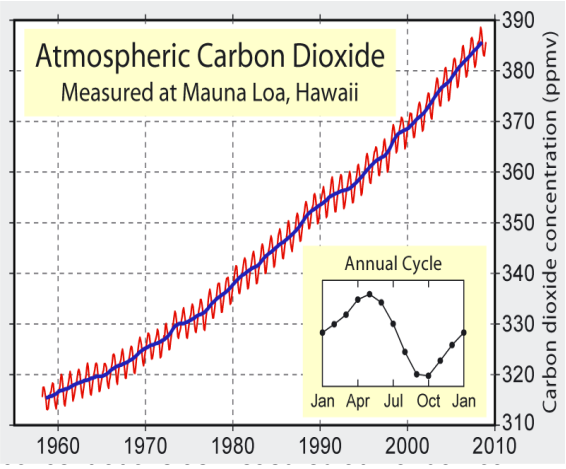
Despite the critical need to address climate change, caused primarily by increasing levels of carbon dioxide (CO_2) in the atmosphere from the burning of fossil fuels, response has been slowed by pressure from vested interests, a focus by some governments on short-term political objectives and the difficulties of reaching effective international agreements. Some countries are already taking effective action though, and the urgent need for others to join them is becoming extremely clear.

New Zealand's emissions are small on a global scale, but on a per capita basis are among the highest in the world. They are not yet showing any clear sign of starting to fall, and our government's projections, extending out to 2030, predict a continuing increase.

A growing understanding



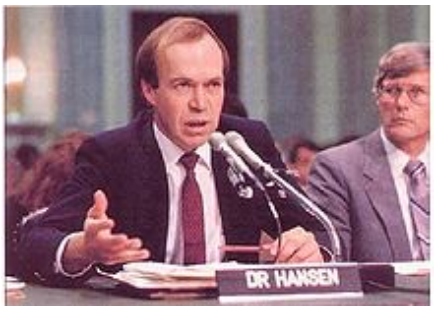
Observatory

The link between rising levels of CO_2 in the atmosphere and increasing global temperatures has been understood since the late 1800s, but CO_2 concentrations were then barely above the pre-industrial level of around 285 parts per million (ppm) [1].

There was little concern until after World War II, when high-precision measurements, started in 1958, showed CO_2 levels were rising rapidly and at an increasing rate. Scientists began to predict major climate changes and associated impacts [2,3,4].

The issue gained wide attention in 1988 when NASA climate scientist, James Hansen, told the US Congress he was 99% certain that the year's record temperatures were a result of the greenhouse effect, and not natural variation.

Later that year the first international climate change conference was held in Toronto. Several hundred scientists and policy makers concluded that human-caused atmospheric changes were a major threat and already having harmful consequences. They further declared that the world should reduce its emissions 20% by 2005.



Hansen giving testimony before the US Congress, 1988

Sustainable Energy Forum

ESR engineers for social responsibility

The Intergovernmental Panel on Climate Change (IPCC) was also established in 1988 to assess the risks of climate change, its possible effects, and ways to adapt to or mitigate these consequences. Thousands of scientists and other experts have contributed to its five assessment reports, issued in 1990, 1995, 2001, 2007 and 2014. They give an increasingly clear picture of the effects we can expect from climate change and the need for urgent action.

In 1992, at the Rio de Janeiro “Earth Summit”, the United Nations Framework Convention on Climate Change (UNFCCC) treaty was negotiated and agreed to by more than 130 countries. Its aim was to "stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic (human induced) interference with the climate system". There were disappointments though. Most industrial countries had been seeking targets and timetables, but the US pushed for a delay in setting dates or levels. There was also opposition from Saudi Arabia and some other oil-producing nations.

The Kyoto Protocol

A breakthrough came in 1997 at the UNFCCC meeting in Japan, with agreement on the treaty known as the Kyoto Protocol. For the first time binding obligations to reduce greenhouse gas emissions were set for participating industrialised countries. Many developing countries also agreed to limit or reduce their emissions on a non-binding basis.

Although almost all UN member countries became parties to the agreement, its effectiveness was considerably weakened because the US, at that time the world’s largest polluter producing over 20% of global emissions, declined to ratify it.

The agreement had a first commitment period of 2008 to 2012 and New Zealand undertook to reduce its net emissions to 1990 levels over that time. “Net emissions” here refers to our actual or “gross emissions”, less credits awarded under the Protocol for sequestering carbon back out of the atmosphere, which in our case relate primarily to planting forestry trees.

Thanks to large forestry plantings, we met this commitment. But in practice the tree planting credits were used as an excuse for delaying any significant action to reduce our actual gross emissions, which at the end of the 2012 commitment period were around 20% above 1990 levels.

Influence of fossil fuel lobby

The US political system is particularly vulnerable to pressure from the fossil fuel industry and related groups. These groups support the main political parties financially and reportedly employ the equivalent of 3 lobbyists for each US congressman.

They also sow uncertainty and confusion among the public by funding and promoting studies that question global warming. Reportedly, $558 million was spent on this purpose in the US between 2003 and 2010 [5]. The tobacco industry previously used this tactic very successfully, delaying action that could affect tobacco sales by raising uncertainty about the health risks caused by smoking.

New Zealand’s response to climate change has also been seriously impeded by corporate lobbying, as documented in the film Hot Air[6].

Addressing our carbon emissions

Early government attempts to introduce emissions charges, dating back to 1994, were dropped after strong lobbying by vested interests. Our Kyoto commitment revived this idea and New Zealand's emissions trading scheme (ETS), enacted in 2008, finally came into effect in 2010. Its purpose was to put a price on CO_2 and other greenhouse gas emissions as an incentive for their reduction. Users coming under the scheme pay for their emissions with “emissions units” purchased from the government or issued under the Kyoto Protocol.

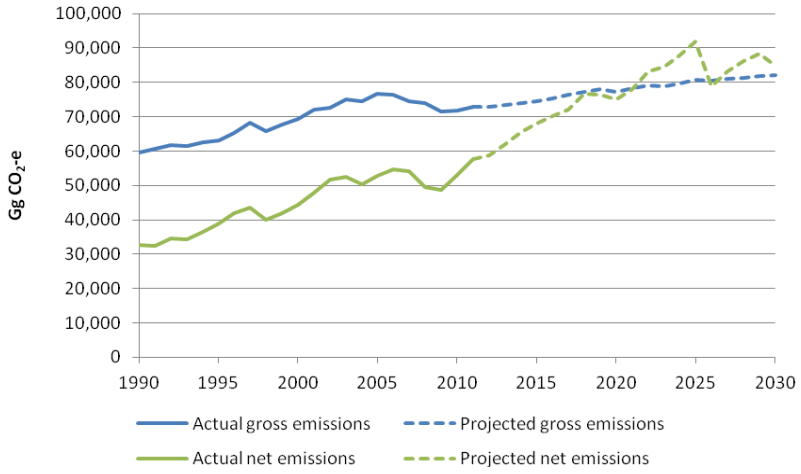
The ETS has been severely criticised for several reasons. Many large companies receive free ongoing allocations of emissions units, significantly weakening the effectiveness of the scheme. There is no cap on the purchase of units, so there is nothing to stop emissions increasing. And including the agricultural sector under the scheme was postponed indefinitely in 2012, even though the sector produces around 47% of our total emissions.

The original plan was to cap prices by making government units available at $25 a tonne of CO_2, but we remain in what was termed a "transition phase", with government units effectively priced at $12.50 a tonne. In practice though, emitters have not had to pay charges at this level because other units have been available at lower cost. The price caps are also well below the often quoted figure of US$85 (approx. NZ$100) a tonne for the damage CO_2 emissions cause, taken from the 2006 Stern Review, carried out for the UK government [7].

Counting agriculture

The agricultural sector of the economy is no longer currently scheduled to be brought under the ETS. A large part of our agricultural emissions do not relate directly to fossil fuel use (which is the primary cause of our problem) and agriculture may therefore deserve special treatment. Yet even these emissions could be substantially reduced, given the right incentives.

Following the global recession of 2008-2010, the international carbon market collapsed. By 2012, Kyoto emission units were available for as little as 15 cents and even New Zealand government units could typically be purchased through the carbon market for under $5 a tonne. Such low charges make the ETS virtually completely ineffective, with emitters paying for only a tiny portion of the damage they cause, leaving most of the cost to be borne by others, in New Zealand or abroad. Taking again the UK damage figure of $100 a tonne as a guideline, emitters who come under the ETS are currently paying well under $200 million a year, while the estimated cost of the damage is around $4 billion a year.



Actual and projected gross and net emissions, 1990 – 2030 [8].

The net emissions are projected to exceed the gross emissions for a period starting around 2020 because of the harvesting of forestry trees planted during the first Kyoto commitment period.

Gg CO_2e – Gigagrams per annum. 10,000 Gg = 10 million tonnes.

The Copenhagen Accord

At the UNFCCC conference in late 2009 world leaders achieved a second breakthrough, with agreement on the goal of limiting global warming to two degrees Celsius (2°C) above the pre-industrial level [9]. This "Copenhagen Accord" was the first full international agreement, including with the US, on any important point related to climate change. Many delegates were severely disheartened and disappointed though, because all attempts to agree on a plan of action to achieve the goal failed.

Many scientists also consider that the 2°C limit is too high. For example, James Hansen and 17 other scientists concluded in late 2013 that this level of warming "would have consequences that can be described as disastrous" [10].

Other international agreements

There are now many cases where efforts by countries to address climate change or otherwise protect the environment have been blocked by foreign governments or corporations. These parties have taken actions under trade-related agreements, claiming that their profits or export earnings would be affected [11]. Now there is evidence that in current secret negotiations over the proposed Transpacific Partnership Agreement (TPPA) between the US, New Zealand and 10 other countries, the US wants to remove any reference to the UNFCCC and commitments to cooperate on climate change.[12]

It is clear that if the world is to meet the current challenges it faces, measures to control climate change and other environmental problems must take precedence over the interests of corporations or foreign governments.

Voluntary targets for New Zealand

Between 2009 and 2013, the government announced a series of non-binding targets for reducing New Zealand's net emissions[13]. By 2020 we aim to reduce emissions to 10%-20% below 1990 levels, *if* a comprehensive global agreement is in place by then *and* a raft of other conditions are met; otherwise the target is 5% below 1990 levels. By 2050 we aim to have emissions 50% below 1990 levels.

We are not on track to meet any of these targets. The targets are far weaker than the reductions needed to hold global warming under 2°C. They also compare poorly with the UK's legally binding target under its Climate Change Act to reduce emissions to 80% below 1990 levels by 2050 [14], which is the same target as set by the EU [15], although the high proportion of our emissions coming from agriculture effectively makes us a special case.

Promoting development of fossil fuels in New Zealand

Scientists have determined that to have an 80% chance of meeting the 2°C temperature limit, around 60-80% of currently known fossil fuel reserves must remain unused [16]. Despite this, in 2012 the New Zealand government began aggressively promoting oil and gas exploration. There has been no public discussion over whether extraction of any new discoveries would be economically viable if the true costs of emissions damage were being charged. Neither have the ethics of such fossil fuel extraction and use been canvassed.

In 2013 the Government also provided subsidies of $46 million to the fossil fuel industry in New Zealand, an increase of over 700% since 2009 [17]. These subsidies run completely counter to the need to phase out of fossil fuels and develop alternative energy sources.

Withdrawing from Kyoto

In November 2012 the New Zealand Government announced that it would not sign up to the second 2013-2020 Kyoto commitment period, but will instead take a non-binding pledge under the UN Framework Convention. This absolves it from all financial liability if targets are not met, and in particular the need to repay credits claimed when forestry trees planted during the first Kyoto commitment period are harvested. New Zealand received heavy criticism for this move, both locally and internationally.

Where to from here?

A report issued by PwC in late 2012 concludes that the world needs to reduce its emissions in relation to gross domestic product by over 5% a year until at least 2050 if we are to hold warming below 2°C [18]. We also know that any delay will rapidly increase both the damage from climate change, and the difficulty and cost of meeting the 2°C target. It is estimated that net mitigation costs increase, on average, by approximately 40 percent for each decade of delay[19].

Despite this, the world's emissions keep increasing, with atmospheric CO_2 levels exceeding 400ppm for the first time in 2013 and global temperatures now around 0.85°C above pre-industrial levels. One key reason is that some industrialised countries, like New Zealand, have failed to start reducing their emissions. Another is that some developing countries like India and China have continued to rapidly increase their use of fossil fuels, arguing that their emissions per capita are comparatively small, and developed countries should act first, though China's CO_2 emissions actually fell slightly in 2014 for the first time in more than a decade.

The World Bank warned in 2012 and 2013 that, because of lack of effective action, we are on track for around 4 degrees of warming before the end of the century – an outcome that "must be avoided" because it would have devastating effects on the health and livelihood of millions of people, as well as other living species [20,21].

Also in late 2012, former UNFCCC secretary-general, Yvo de Boer, called for the carbon price to move quickly to the order of €150 (approx.. NZ$245) a tonne of CO_2[22]. Although he was talking in

terms of the price signals needed for the European Union to meet its 2050 goals for emissions reductions, his comments apply more widely.

The fifth IPCC assessment report issued in early 2014 presents a truly frightening picture of where we are currently headed[23]. It warns of falling crop yields, dwindling fish catches, regions becoming too arid to farm effectively, agricultural and living areas lost to major rises in sea level and an increasing number of extreme weather events such as floods, storms, droughts and heat waves. The expected outcomes include severe humanitarian crises, food shortages, population displacements, armed conflicts and mass extinctions.

At the December 2012 meeting of the UNFCCC it was agreed to continue the Kyoto Protocol through to 2020. A further international meeting is now scheduled to be held in Paris in December 2015, with the objective of achieving a binding and universal agreement on climate, from all the nations of the world. Our chances of limiting the global temperature rise to 2°C will be strongly dependent on the outcome of this meeting.

Positive steps forward

Despite the very slow rate of progress internationally, some regions have already made significant achievements. Here are three examples.

A biogas bus in Linköping, Sweden. Hundreds of Swedish buses now run on this sustainably produced fuel.

1. In 1991 Sweden introduced a CO_2 tax which by 2011 had risen to 1050 krona (approx.. NZ$190) a tonne over some sectors of the economy. It has spurred strong development of green options. Sweden's gross emissions have fallen to around 20% below 1990 levels without interrupting economic growth [24,25]. (New Zealand's gross emissions rose by around 20% over the same period.)

2. In 2000 Germany passed a law guaranteeing producers of electricity from renewable resources the right to sell into the grid at a reasonable price and receive preference over electricity generated by other means [26]. The percentage of electricity generated in this manner has since increased from 6.3% in 2000 to 23.4% in 2013, and is on track to reach Germany's target of 80% by 2050. (New Zealand power companies are not obliged to buy energy generated from renewable sources, such as domestic solar units, nor to pay a realistic price should they agree to do so.)

3. In 2008 the Canadian province of British Columbia introduced a tax per tonne of CO_2 increasing at $5 a year until it reached $30 (approx.. NZ$32) in 2012 [27]. The tax was kept revenue-neutral by reducing corporate and income taxes at an equivalent rate. Greenhouse gas emissions have since fallen more than 5%. (New Zealand's ETS has no provision to compensate the general public for the increased costs of goods and services resulting from emissions charges, and the ETS is far more costly and complex to operate than a simple carbon tax.)

New Zealand is strongly placed to reduce its dependence on fossil fuels. We have enormous potential to capture hydro, geothermal, wind, solar and tidal energy. We could also produce carbon-based fuels sustainably from forestry operations, agricultural crops and animal wastes. These changes would reduce the over $7 billion a year we currently spend on fossil fuel imports – around half of our earnings from dairy exports.

It is critically important that the world rapidly reduces its greenhouse gas emissions. New Zealand still has the opportunity to play a key role and to set a global example in achieving the changes that are urgently needed to avoid humanitarian disaster and to leave behind a liveable planet for our children and grandchildren.

Notes:
Foreign values converted to NZ dollars at trading rates for early 2014.

Abbreviations:
CO_2 - carbon dioxide
ETS - emissions trading scheme
EU – European Union
IPCC – Intergovernmental Panel on Climate Change
NASA - National Aeronautics and Space Administration
NZ – New Zealand
ppm – parts per million
UK – United Kingdom
UN – United Nations
UNFCCC – United Nations Framework Convention on Climate Change
US – United States of America

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Peer Reviewed by
Associate Professor Ralph Chapman
Director, Graduate Programme in Environmental Studies,
Victoria University of Wellington.

While the reviewer has provided comment on drafts of this article,
he does not necessarily endorse it in its final form.
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