

13 Climate change – New Zealand and International Response

Peter Whitmore BSc, BE (Hons), PhD (Chemical Engineering)

Despite the critical need to address climate change, caused primarily by increasing levels of carbon dioxide (CO₂) 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.

International agreement was reached in Paris in 2015 on the goal of holding the global average temperature to well below two degrees Celsius (2°C), and if possible to less than 1.5°C, above pre-industrial levels. However, national commitments made to date to reduce emissions are far less than are required to meet either of these targets.

New Zealand's emissions are small on a global scale, but on a per capita basis are fifth highest among the developed countries. Our latest target for emissions reductions is weak compared to many other countries, and the most recently available projections show our gross emissions continuing to increase to 2020 and possibly out to 2030.

A growing understanding

The link between rising levels of CO₂ in the atmosphere and increasing global temperatures has been understood since the late 1800s, but CO₂ concentrations were then barely above the pre-industrial level of around 285 parts per million (ppm).¹ There was little concern until high-precision measurements, started in 1958, showed CO₂ levels were rising rapidly and at an increasing rate. Scientists began to predict major climate changes and associated impacts.^{2,3,4}

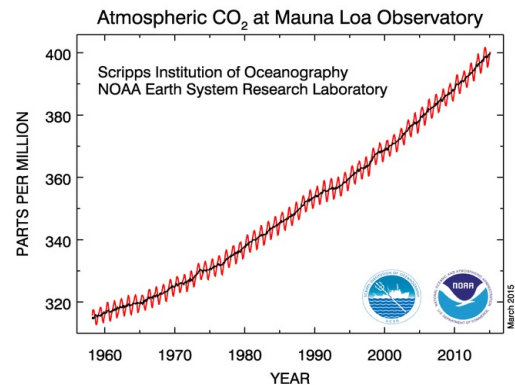
The issue gained wide attention in 1988 when NASA climate scientist, James Hansen, told the US Congress he was 99% certain that the year's record temperatures were a result of the greenhouse effect, and not natural variation.



Hansen giving testimony before the US Congress, 1988

Later that year, the first major 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.

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 between 1990 and 2014. They give an increasingly clear picture of the effects we can expect from climate change and the need for urgent action.



The Keeling Curve: Atmospheric CO₂ concentrations as measured at Mauna Loa Observatory. Courtesy the US National Oceanic and Atmospheric Administration



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.

The agreement’s effectiveness, though, was considerably weakened because the US, at that time the world’s largest polluter producing over 20% of global emissions, declined to ratify it. Also, during the negotiations, the US had pushed for the inclusion of an emissions trading system, which was a new approach to tackling climate change. Despite considerable opposition, this was finally included in the agreement. One outcome is that many countries have now gone down the emissions trading scheme route, rather than a simple carbon charge, as a way of controlling their emissions.

New Zealand entered the Kyoto agreement and undertook to reduce its net emissions to 1990 levels over the first commitment period of 2008 to 2012. “Net emissions” here refers to our actual or “gross emissions”, less credits awarded under the Protocol for sequestering carbon back out of the atmosphere. In our case this sequestration was achieved primarily through planting forestry trees, which absorb CO₂ as they grow.

Thanks to large forestry plantings, we met this commitment. But in practice the tree planting credits enabled us to do so without taking any significant action to reduce our actual gross emissions, which at the end of the 2012 commitment period were around 20% above 1990 levels. Also, New Zealand’s Kyoto commitment was defined in terms of comparing our net emissions level at the end of the commitment period with our gross emissions level in 1990. This confusing mix of two different measurement methods obscured the weakness of the target and eased the pressure on New Zealand to cut its gross emissions.

The UNFCCC meetings are often referred to as Conferences of the Parties or COPs. At the 18th COP in December 2012 in Doha, it was agreed to continue the Kyoto Protocol through to 2020, but in November 2012 the New Zealand Government announced that it would not sign up to a second commitment period, taking instead a non-binding pledge under the UN Framework Convention. It received heavy criticism for this move, both locally and internationally, and it meant that New Zealand was shut out of international carbon markets from 2013.

Early measures to address 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 the idea of using a price on carbon to reduce emissions, and New Zealand’s emissions trading scheme (ETS), enacted in 2008, finally came into effect in 2010. Its purpose was to put a price both on CO₂ and on other

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 and taking other steps to block action against climate change. Reportedly, US \$115 million a year is currently being spent for this purpose.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

greenhouse gas emissions as an incentive for their reduction. Users coming under the scheme paid for their emissions with “emissions units” purchased from the government or issued to other country parties 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 its effectiveness. There was no cap on the purchase of units, so there was little except a fluctuating and often low price to stop emissions increasing. And including the agricultural sector under the scheme was postponed indefinitely in 2012, even though the sector produces around 49% of our total emissions.

The original plan was to cap prices by making government units available at \$25 a tonne of CO₂, but up until January 2017 New Zealand remained in what was termed a “transition phase”, with government units effectively priced at \$12.50 a tonne. This cap was well below the often-quoted figure at that time of US\$85 (approx. NZ\$115) a tonne for the damage which CO₂ emissions cause, taken from the 2006 Stern Review, carried out for the UK government.⁷

In practice, though, emitters did not have to pay charges at any significant level because international units were available at low cost. Following the global recession of 2008-2010, these units were selling for as little as 6 cents. During that period, even New Zealand government units could typically be purchased through the carbon market for under \$5 a tonne. Such low charges made the ETS ineffective, with emitters paying for only a tiny portion of the damage they caused, leaving most of the cost to be borne by others, in New Zealand or abroad.

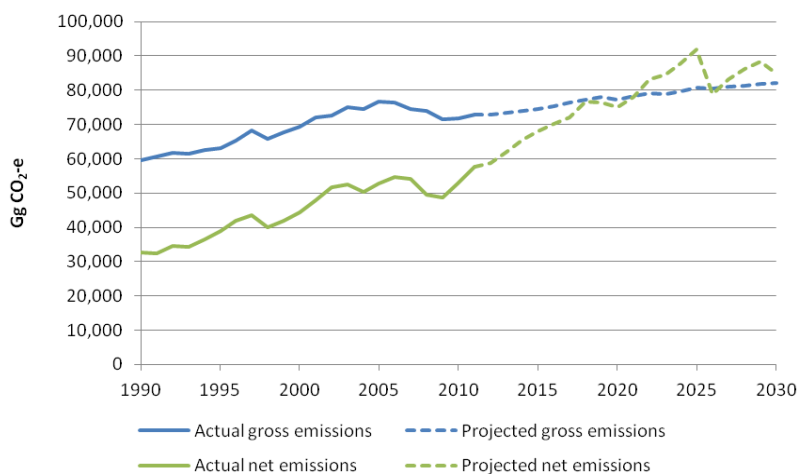


Figure 1: Actual and projected gross and net New Zealand emissions, 1990 – 2030.⁸

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 CO₂e – Gigagrams (per annum).
10,000 Gg = 10 million tonnes.

The Copenhagen Accord

At the COP15 meeting in late 2009 world leaders achieved a second breakthrough, with agreement on the goal of limiting global warming to below 2°C above the pre-industrial level, which was the de facto politically accepted target at the time.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

Earlier New Zealand emissions targets

Between 2009 and 2013, the government announced some non-binding targets for reducing our net emissions.¹¹ However, these were all quite misleading because they involved comparing our net emissions in target years with our gross emissions in base years¹². The first was to reduce them to 10%-20% below 1990 gross levels by 2020, subject to a raft of conditions including a comprehensive global agreement being in place. Otherwise the target was 5% below 1990 gross levels. The second was to reduce them to 50% below 1990 gross levels by 2050.

We have not been on track to meet any of these targets, all of which are far weaker than the reductions needed to hold global warming under 2°C. They also compared poorly with the UK's legally binding target under its 2008 Climate Change Act to reduce emissions to 80% below 1990 levels by 2050,¹³ which was the same target as set by the EU at that time,¹⁴ although the high proportion of our emissions coming from agriculture arguably makes us a special case.

Promoting development of fossil fuels in New Zealand

Scientists have determined that to have an 80% chance of meeting a 2°C temperature limit, around 60-80% of currently known fossil fuel reserves must remain unused.¹⁵ Despite this, in 2012 the New Zealand government began aggressively promoting oil and gas exploration. This approach was still continuing in 2017. There has been considerable public discussion over the ethics of this decision, and whether extraction of any new discoveries would be economically viable if the true costs of emissions damage were being charged.

In 2013 the Government also provided subsidies of \$46 million to the fossil fuel industry in New Zealand, an increase of over 700% since 2009.¹⁶ These subsidies, which have continued on, run completely counter to the need to phase out fossil fuels and develop alternative energy sources.

New Zealand is not the only country still subsidising fossil fuels. In 2009, the US and other members of the G20 group of nations (Group of Twenty major economies) agreed to phase out “inefficient fossil fuel subsidies” in order to reduce greenhouse gas emissions. However, a recent report has found that the US is providing over US\$20 billion a year to fossil fuel producers and this amount has actually increased since the phase-out pledge was made.¹⁷

International trade 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.¹⁸

For example, India's ambitious solar program, launched in 2010, encouraged the use of locally manufactured content. The US challenged this arrangement in 2013 and took a case before the World Trade Organisation. One of India's arguments was that it was attempting to meet domestic and international obligations related to ecologically sustainable development and climate change, but the WTO ruled in 2016 that this was not a valid reason for violating agreed trade rules.¹⁹

In the recently negotiated Transpacific Partnership Agreement (TPP) between the US, New Zealand and 10 other countries, which has now been set aside following the Trump presidency, all references to climate change, the UNFCCC and commitments to cooperate on these matters were reportedly removed on US insistence.²⁰

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 trade-related interests of corporations or foreign governments.

Mounting pressure for action

Because of the inadequate response to date, the world's emissions have not yet begun to fall, although they did plateau for three years between 2014 and 2016. Atmospheric CO₂ levels exceeded 400ppm for the first time in 2013 and global temperatures reached a record of 0.99°C above pre-industrial levels in 2016.

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.^{21,22}

We also know that postponement of effective action rapidly increases both the damage from climate change and the difficulty and cost of meeting the 2°C target. It has been estimated that net mitigation costs increase, on average, by approximately 40 percent for each decade of delay.²³

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\$220) a tonne of CO₂.²⁴ 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.



Ahead of the UN Climate Summit in Paris over 30,000 New Zealanders joined climate marches.

The fifth IPCC assessment report issued in early 2014 presents a truly frightening picture of where we are currently headed.²⁵ 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.

Strong pressure for much faster progress is also coming from the public. For example, in 2015, just prior to the start of the Paris negotiations, more than 600,000 people in 175 countries took part in climate-related marches.

The leadup to Paris

After ongoing efforts to make further progress, in late 2011 at COP17 it was agreed to start negotiations for a legally binding agreement to be adopted in 2015. Then, in late 2014 at COP20 it was decided that each nation would submit their commitment (INDC or Intended Nationally Determined Contribution) to reduce emissions so as to hold global warming to under 2°C by 2100. This would then become an NDC (Nationally Determined Contribution) when the country ratified the agreement.

The New Zealand Government sought public feedback on this issue and received over 17,000 written submissions. Of these over 10,000 suggested specific targets, with almost 70% seeking to reduce emissions to at least 40% below 1990 levels by 2030.²⁶ However, the government subsequently set a much lesser target to reduce emissions by 30% below 2005 levels by 2030, which is equivalent to 11% below 1990 levels, by 2030.²⁷

However, although it was not made clear in our INDC, the government was again setting a target based on comparing net emissions in the target year with gross emissions in the base year. This comparison of apples and oranges makes the target rather meaningless.¹² If we work on a consistent net-net basis using recent emissions data²⁸ then the target is to *increase* emissions by 2030 to 7% *above* 2005 levels, which is equivalent to 67% *above* 1990 levels.

New Zealand's INDC compared poorly with that of many other countries and was rated as "inadequate" by Climate Action Tracker.²⁹ In comparison, for example, the EU committed to a 40% reduction from 1990 levels by 2030, but even this was not considered sufficient to hold the global temperature increase below 2°C. Some other countries submitted significantly higher targets.

Agricultural emissions

We are now also gaining a better understanding of how agricultural emissions can be reduced. For example, fencing off streams and wet areas, and providing hard stands where necessary to keep cattle out of mud, reduces emissions of nitrous oxide. It is also possible to breed cattle that produce significantly lower methane emissions. Both of these are greenhouse gases that contribute to global warming.

Moving to greater reliance on organic farming methods, rather than artificial fertilizers, reduces emissions. It has also been found that farming is often carried out more intensively than gives the best economic result. In this case, farmers can reduce emissions and at the same time become more profitable by cutting herd numbers.³⁰

It is true that New Zealand is a special case because of the large proportion of emissions coming from agriculture, most of which do not relate directly to fossil fuel use (which is the primary cause of our problem). But while agriculture may deserve special treatment, these emissions can still be reduced substantially, given the right incentives. And as Young has noted, “If we look at changes in CO₂ emissions only, New Zealand actually ranks the same as or worse than when we include all greenhouse gases”.³¹

The Paris agreement

At the COP21 meeting in Paris in late 2015 a further major breakthrough was achieved, with leaders of over 190 countries reaching international agreement on “holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change”.³² The agreement also contains a “ratchet mechanism”. Every five years, countries are required to review and re-submit their NDCs, so that each successive NDC “will represent a progression beyond” the country’s previous one. However, while the agreement contains legally binding commitments, it does not contain legally binding obligations on any state to meet these targets.

New Zealand subsequently ratified this agreement in October 2016 and the agreement itself became fully effective in November 2016.

One very serious downside of the agreement is that the NDCs submitted are not nearly sufficient to meet the agreed goals. Even if all these commitments were met, scientists report they still imply a median warming of 2.6–3.1°C by 2100.³³ Also, the agreement is about future promises rather than actual actions right now. Leading climate scientist, James Hansen’s comment was “It’s just worthless words. There is no action, just promises. As long as fossil fuels appear to be the cheapest fuels out there, they will continue to be burned.”

Because of these shortcomings there have been other post-Paris calls for action. For example, in 2017 the Potsdam Institute stated that global emissions must peak by 2020 because declining emissions after that date are a necessity for meeting the Paris 2°C target³⁴. For a similar reason, former UN climate chief, Christiana Figueres, and others, have set out a three-year plan to safeguard the climate³⁵. This includes taking rapid steps to cut fossil fuel use and to move to greater reliance on renewably sourced energy in various sectors of the economy, as well as moving the finance sector towards providing much higher resources for climate action.

Meeting our Paris commitment

Just prior to the start of the Paris talks our government decided to review the emissions trading scheme (ETS), which remains our main tool for controlling and reducing emissions. It is reasonably clear that the government wants to retain the ETS, even though a basic carbon charge would be much simpler and less costly to operate and to comply with.

In May 2016, following the initiation of this review, the government announced one major change - the long-delayed phasing out of the “transition phase” which allows the payment of one NZ emissions unit for two tonnes of emissions. The 50% unit cost increases to 67% from 1 January 2017, to 83% from 1 January 2018 and to 100% from 1 January 2019.

While this is a small step forward, a recent paper puts the cost of the economic damage caused by CO₂ emissions, sometimes referred to as the social cost of carbon, at US\$220 (approx. NZ\$300) a tonne.³⁶ Based on this figure, even if all New Zealand emitters were paying \$25 a tonne, since our total annual net emissions are around 57 million tonnes CO₂-e they would effectively still be receiving a subsidy of around NZ\$17 billion a year.³⁷ Currently almost all of this damage cost is being or will be met by others. This is neither fair, nor is it the way to encourage emissions reductions.

Other aspects of the ETS currently remain unchanged, including:

Provision of free units to some business engaged in emissions intensive trade exposed (EITE) activities – This is not a satisfactory longer-term approach. We need to apply

appropriate carbon charges to our exports and to put pressure on our trading partners to also apply such charges to products they manufacture. The government has agreed in principle to phase out free allocations by 2025.

Acceptance of international units – Despite our past experiences, the government has signalled that it wants to leave open the possibility of accepting such units, the argument being that it may cost less to reduce emissions somewhere overseas than it does in New Zealand. If this proceeds, we will be spending overseas funds while lowering the rate at which we reduce our own emissions, which is what our primary responsibility should be.

Inclusion of forestry – We are currently the only country that includes commercial forestry within its ETS. Under the current rules this leads to a lot of administrative work. Regular claims for emissions units have to be made for carbon capture as the trees grow, but when they are harvested most of the carbon capture they have achieved is taken as having been reversed and an appropriate number of emissions units have to be surrendered. These rules may get changed because the Paris rules do not require accounting for ongoing harvesting or re-growth of forests.

The above features contribute to making the way the ETS operates rather opaque. Information on what types of units are being submitted, when these units were issued and what the related charge was, is not publicly available. There is also no public data available on the number of freely allocated units a trade exposed industry receives in relation to its actual emissions. (A trade exposed industry is one which may not be able to pass on increasing costs resulting from the ETS to its customers because it is competing with other suppliers who may not face these same costs, for example, overseas suppliers.)

As emissions charges increase, as is required both to reflect the damage costs and to provide sufficient incentive for their reduction, the cost of goods and services will also increase. To make the process workable much or all of the revenue from the emissions charges will need to be returned to the population. There has so far been little discussion on how or when this might happen. One suggestion from overseas is to introduce a citizen's dividend paid monthly, with every adult receiving one share and every child under 18 receiving a half share.

In December 2017 the government announced its intention to work towards introducing a Zero Carbon Act, and to establish an independent Climate Change Commission.³⁸ If this can be achieved, it will be a major step forward. It is an initiative that has been strongly promoted by youth group, Generation Zero, and follows the model of the 2008 UK Climate Change Act¹³. Under the Act, the plan is to set a framework in place in order to achieve a net zero emissions economy by 2050, with the Climate Change Commission providing independent advice in relation to achieving this goal.

Positive steps forward

Despite the 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 CO₂ tax which by 2011 had risen to 1050 krona (approx. NZ\$170) a tonne over some sectors of the economy. It has spurred strong development of green options. By 2013 Sweden's gross emissions had fallen to around 23% below 1990 levels without interrupting economic growth.^{39,40} (New Zealand's gross emissions rose by 21% 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.⁴¹ The percentage of electricity generated in this

manner has since increased from 6.3% in 2000 to 32.3% in 2016, 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 CO₂ increasing at \$5 a year until it reached \$30 (approx. NZ\$31) in 2012.⁴² The tax was kept revenue-neutral by reducing corporate and personal income taxes at an equivalent rate. Greenhouse gas emissions had fallen by around 6% by 2013 compared to the last pre-tax year (2007). These charges will almost certainly need to be increased, but this initiative still provides an excellent example of how a simple carbon tax can be successfully introduced. (New Zealand's ETS currently has no provision to compensate the general public for the increased costs of goods and services resulting from emissions charges, and 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:

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Foreign values converted to NZ dollars at trading rates for late 2017.

Abbreviations:

CO₂ - carbon dioxide

CO₂-e – carbon dioxide equivalent – including the impact of other greenhouse gases

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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