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**Submission re “New Zealand’ Climate Change Target”,  
Ministry for the Environment, 2015**

**Submitted by: New Zealand Climate Party**

**Setting and meeting New Zealand’s climate target**

The New Zealand Climate Party was formed in 2014 with the aim of getting the political system to properly address the threats and challenges raised by climate change.

**Introduction**

Climate change is probably the greatest challenge and the greatest threat mankind has faced since the end of the last ice age, 10,000 years ago. The need for urgent and effective action is now extremely clear.

All countries have been asked to put forward a target for reduced emissions after 2020 in advance of the UNFCCC meeting in Paris in Dec 2015. This submission relates to setting New Zealand’s target.

In this document the term “emissions” refers to greenhouse gas emissions. NZ emissions figures are mostly taken from the NZ Greenhouse Gas Inventory 1990-2013. These and other emissions figures are expressed in terms of equivalent carbon dioxide levels, CO<sub>2</sub>e. Conversion rates between currencies are based on May 2015 currency values.

**The urgent need for action**

The need for action to limit the effects of anthropogenic (human induced) effects on the climate by reducing greenhouse gas concentrations in the atmosphere has been well understood for at least 25 years.

Because of the slow rate of action over this period, global emissions have kept increasing and the need for action has now become extremely urgent. Scientists say we are currently on track for between 4°C and 6°C by the end of the century. This will have severe effects on both humans and many other species, and may not even leave a planet that is inhabitable by mankind.

In 2009 international agreement was reached that global warming should be limited to 2°C above pre-industrial levels. While reaching this agreement was an important step, many scientists consider that the 2°C temperature limit is too high and will lead to disastrous consequences (eg see Hansen et al, PLOS One, 2013).

The IPCC (2014) concluded that in order to keep warming to under 2°C, global emissions need to be reduced to between 40% and 70% below 2010 levels by 2050 and to near zero by 2100. While these figures provide a current guideline for meeting the 2°C target, a response at this range of levels may turn out to be too weak, and the 2°C target itself may need be reduced. Globally, we therefore need to aim for the higher levels of the IPCC targets, or above.

In response, many developed and developing countries have already adopted strong targets for emissions reductions - see the examples given below. These are current domestic targets. The targets submitted under the UNFCCC for the 2015 Paris meeting may differ.

- Costa Rica – Carbon-neutral by 2021. This country is strongly agricultural with a similar population to New Zealand
- Sweden – 40% reduction below 1990 levels by 2020. No net emissions by 2050.
- Denmark – 40% reduction below 1990 levels by 2020. This is now enshrined in law.
- Germany – 40% reduction below 1990 levels by 2020, and 80% by 2050 (set in 2007).
- UK - 80% reduction below 1990 levels by 2050 (set in 2008). This is covered by the Climate Change Act.
- EU - 40% reduction below 1990 levels by 2030 (excludes forestry emissions and removals)

### **Our record to date**

New Zealand's response to climate change to date has been ranked "poor" in an annual assessment released in December 2014 by Germanwatch and the Climate Action Network Europe and "inadequate" in March 2015 by Climate Change Tracker, a consortium of four research organisations. This is not surprising because between 1990 and 2013 (most recent figures available) our gross emissions rose by about 21% and our net emissions by about 42%.

Our extremely poor record is a result of our failure to date, to take any sufficiently effective action. In particular, our emissions trading scheme has essentially degenerated into a farce, with polluters up until recently able to pay as little as 15 cents a tonne for their emissions using international "Kyoto" units, and many polluters paying nothing for significant parts of their emissions because they get issued with free NZ units.

The setting of our targets under the Kyoto Protocol, where our initial 1990 gross emissions figure was compared with later net figures after allowing for subsequent forestry plantings, also gave a highly misleading impression of what our emissions were actually doing. While we met our Kyoto commitment on paper by holding our 2012 net emissions below our 1990 gross emissions level, in practice over this period our gross emissions increased by 25% and our net emissions by 111% (NZ Greenhouse Gas Inventory, 1990-2012). (Note: The 1990-2013 inventory gives an increase in net emissions from 1990 to 2013 of 42% - much lower than the 111% figure above.)

Our currently published targets for a 5% reduction of emissions below 1990 levels by 2020, and a 50% reduction below 1990 levels by 2050, are also weak by international standards. The government's stated intention that "New Zealand will meet these targets through a mix of domestic emission reductions, the storage of carbon in forests and the purchase of emission reduction units from other countries" further indicates that we are planning to meet our targets partly in other ways than by reducing our actual emissions – see later.

## Setting the New Zealand target

- The target needs to be set in terms of gross emissions, or net emissions that take into account long term changes in land use. Including planting and harvesting of forestry in the net calculations, when the typical harvesting time is around 35 years, just causes confusion and extra bureaucratic work to no significant advantage.

- The discussion document points out that our population has grown 31% since 1990, compared with an OECD average of 18%, which gives a 13% difference. This adds an additional challenge to meeting targets. We already knew in 1990 that global warming was a serious problem that needed action to reduce emissions and we chose to encourage high levels of immigration despite this. Hence we should not use population arguments as a reason for lowering our emissions targets.

- As the discussion document points out, New Zealand is in a special position because of the large proportion of its emissions that come from the farming sector – 48.4% in 2013. Splitting the determination of our target into non-agricultural emissions and agricultural emissions will make it clearer what we intend to achieve and how we intend to achieve it.

- While agricultural emissions (approx 70% methane and 30% nitrous oxide) are not directly related to fossil fuel use, they still have an effect on global warming so there is a strong incentive to reduce them. There are now many established ways of achieving this, with more approaches coming out of current research.

- Based on the updated information from the ICF International 2008 report prepared for the Ministry of Agriculture and Forestry, Bertram and Terry (The Carbon Challenge, 2010) conclude that the agriculture sector holds by far the biggest set of low cost abatement opportunities for NZ. (They also rebut the suggestion made by some that significant carbon prices would make large numbers of farms not economically viable.) The NZ Sustainability Council (2009) further concluded, based on these figures, that the nation's agricultural emissions can be cut by over 13%, not just cost-effectively, but at an overall profit to the farmer.

- Methane emissions have been found to vary considerably between individual animals. Past work indicates that a reduction of approximately 20% in these emissions may be possible through selective breeding. More recent work by Agresearch (Peter Janssen, NZ Agricultural Greenhouse Gas Mitigation Conference, 2015) has identified compounds that reduce methane emissions by inhibiting the activity of methane-producing bacteria in the gut of cows and sheep. Initial trials with sheep gave reductions in methane of 30-90%.

- Nitrous oxide emissions can be significantly reduced by minimising the time that animals spend in wet areas. They can also be strongly reduced by feeding animals with inhibitors, though this approach is currently on hold because the inhibitors used on dairy animals were detected in milk. Recent work shows that adding biochar (a form of charcoal) to the soil can have a very strong effect, with reductions in nitrous oxide emissions of 60% and even higher figures (see for example, R Felber Et al, Biosciences Discuss, 2012).

- It is appropriate to also consider credits or reductions in emissions relating to land use, land use change and forestry (LULUCF) together with agricultural emissions. These could relate, for example, to planting of steep slopes in native bush or forestry crops, and fencing off and planting wet areas and areas adjacent to waterways.
- Regarding our non-agricultural emissions, we are in a strong position to take action because we have:
  - Major undeveloped resources of solar, wind, tidal, geothermal and hydro energy.
  - The potential to derive energy and create biofuels from forestry operations, agricultural crops and organic waste.
  - A skilled workforce, the technical know-how and the financial resources to make the necessary changes.
- We also need to take strong and effective action because per capita we have a long history of being responsible for high levels of emissions and our current emissions are one of the highest per capita in the world.
- The world desperately needs countries to take a leadership role, and despite its poor record to date, NZ is actually in an advantageous position to take on such a role and to set an example of what is possible.
- Target for non-agricultural emissions
  - Given our strong position, for these emissions we should aim to at least meet the common European target of an 80% reduction below the 1990 level of 32,369.7 kt by 2050.
  - Based on current emissions level of 42,722.1 kt (estimated from the 1990 figure above and the 2013 figure of 41,784.3 kt), this requires an annual compounded reduction in emissions of approx 5.25% pa starting in 2016.
  - This rate of reduction would give a reduction by 2030 of approx 41% in relation to 1990 non-agricultural emissions and 55% in relation to estimated current non-agricultural emissions.
  - Hence, with this rate of reduction, we are in a position to adopt and put forward prior to the Paris meeting the following target:
    - 40% reduction in non-agricultural emissions by 2030, and 80% reduction in these emissions by 2050.**
- Target for agricultural emissions
  - Between 1990 and 2013 our agricultural emissions increased from 34,350.6 kt to 39,177.3 kt, an increase of 14.1%, which is equivalent to 0.57% pa. In these calculations the latter figure, 39,177.3 kt, is taken as an approximation of the current 2015 level.
  - If we aimed for an overall reduction in emissions of 40% below 1990 levels by 2030, agricultural emissions would need to fall by around 4.6% pa. This reduction figure would include allowance for credits related to land use, land use change and forestry.
  - Current indicators are that this rate of reduction is achievable without any major reductions in farm productivity. It is more difficult to project possible reductions out to 2050. Hence we are in a position to adopt and put forward prior to the Paris meeting the following target:
    - 40% reduction in agricultural emissions by 2030.**

### **Achieving the target – general**

- Take steps to start reaching the target immediately it has been set. Waiting until 2020 is far too late. Any delay increases the damage from global warming and the cost and difficulty of addressing it.
- Once longer range targets are in place, annual targets need to be set to ensure that we remain on track.
- Give the government a legal responsibility to ensure that targets are met.
- Require that targets be met by reducing New Zealand's actual emissions, not by actions such as purchasing emission reduction units from other countries – see below.

### **Achieving the target – a carbon charge**

- Move to a carbon charge per tonne of CO<sub>2</sub>e rather than an emissions trading system. It is simpler and less costly to operate, more effective, more transparent and allows the government to apply the revenue collected in an appropriate manner. (Under the current ETS the public do not get any clear information regarding: (i) what quantities of what types of units – NZ or overseas – emitters are submitting each year; (ii) what price they are paying for each of these types of units; (iii) how many of the NZ units are free units allocated by the NZ Government; and (iv) who is allocated these free units and how many do they receive each year.)
- The use of international units, or their equivalent, should not be allowed in relation to NZ-based activities. To be fair and effective, the carbon charges need to be fully met by the NZ users of the fossil fuels.
- The carbon charge needs to apply to all goods and services produced in NZ, whether exported or not. The current approach of supplying some exporters with free emissions units has two strongly negative effects: (i) the cost of the goods or services provided does not reflect the damage caused by the carbon emissions resulting from their manufacture; and (ii) the incentive for the NZ provider to reduce its emissions is seriously compromised.
- The carbon charge should also apply to any fossil fuels recovered from NZ territories and exported. In cases where it can be reliably established that the receiving country is applying an appropriate charge to these fuels when used, then this requirement can be relaxed.
- The government needs to make provision for a carbon levy on imports from countries whose carbon charges are at an inadequate level to reflect the damage made by their emissions. Allowing such imports into the country without these charges is unfair to competing local producers and is detrimental to controlling global warming because the price signals needed to drive emissions reductions are too low, or missing entirely. This provision would initially apply primarily to developed countries with inadequate carbon charges. Developing countries need more time to get appropriate charging systems in place.

- A large part of the revenue generated from carbon charges needs to be recycled to NZ citizens and residents. This will ensure that people's incomes are not strongly adversely affected, while at the same time they are presented with the right price signals to make appropriate choices about how they live.

- It is particularly important that sufficient revenues are recycled to those on low incomes so as to ensure that they are not adversely affected in relation to the rest of the population. Going beyond this, these carbon revenues can be used to reduce the growing income inequality in our country, and the problems it is causing.

- The carbon charge for CO<sub>2</sub> emissions needs to be sufficient to provide the necessary price signals for NZ to meet its targets. For the same reason, in late 2012, former UNFCCC secretary-general, Yvo do Boer, called for the carbon price in Europe to move quickly to the order of €150 (approx NZ\$228). Sweden, which by 2012 had reduced its gross emissions by around 21% since 1990, already has charges as high as approx NZ\$195 per tonne, though some sectors of the economy pay lower rates.

- The carbon charge also needs to move quickly to a level that is least as high as the estimated damage that the emissions cause. A 2006 report for the UK government put this figure at US\$85 (approx NZ\$110) a tonne, but the figure rises with time, so this estimate is now out of date.

- The lowest figure for emissions damage that is currently widely quoted comes from the US Environmental Protection Agency. Their "central" estimate in terms of today's dollars is US\$39 (approx. NZ\$51) per tonne, but this is almost certainly far too low for two reasons. First, it is calculated using a business-as-usual discount rate of 3% which is likely to be too high. As the discount rate is reduced, the damage estimate climbs steeply, eg, it increases almost 60% if the discount rate is dropped to 2.5%. And second, many of the negative effects of climate change are not taken into account in arriving at the estimate. A recent paper (Moore and Diaz, Nature Climate Change, Jan 2015) reviews the EPA approach and estimates the damage cost at US\$220 (approx NZ\$286) a tonne. The increase is because the EPA estimate assumes that climate change cannot affect the growth of the economy, whereas recent empirical results show that it can and does. An earlier study (Ackerman and Stanton, economics-ejournal, April 2012) gave estimates of emissions damage that were in most cases higher than EPA figures by an order of magnitude or more.

- Given our long delay in taking any effective action, and the urgent need for change, we need to rapidly move to application of the appropriate carbon charge level. This is particularly important because we can expect the required carbon charge level to rise with time. For example, the EPA estimate for 2020 is 18% higher than for 2015.

- There may be an argument for the carbon charge to vary between sectors, as it does in Sweden for example, because the pricing signals needed to meet specified goals in various sectors of the economy may differ. However, there is no argument for the charge in any sector to remain at a level that is less than the estimated cost of the damage caused.

- Emissions of methane and nitrous oxide may need to be treated differently from CO<sub>2</sub>, when these arise from the agricultural sector. It is difficult to assess at what rate these emissions are being produced at a given location and there is a limit to how far they can be reduced. However, there still need to be incentives in place to drive reductions – see under Other Steps.

### **Achieving the target – other steps**

#### Electricity

- Require power companies to purchase electricity generated from renewable resources, including domestically, in preference to electricity generated from fossil fuels, and to pay an appropriate price for doing so. (Germany made this change in 2000. Its percent of electricity generated from renewable resources has since increased from 6.3% in 2000 to 23.4% in 2013 and is on track to meet its target of 80% by 2050.)

#### Recovery of fossil fuels

- Cease all deep-sea oil exploration and recovery. The Central American country of Costa Rica has already taken this step. Scientists tell us that 60-80% of all currently known reserves must remain in the ground, so there is no justification for trying to recover fuels from difficult locations, or where there are significant non-climate related environmental risks.
- Phase out the use of coal and lignite by 2030, including not agreeing to the opening of any new mines, starting immediately. These are the dirtiest of the fossil fuels and hence demand the most urgent attention.
- Remove all subsidies related to fossil fuel exploration and exploitation. These give price signals that push activity in the diametrically opposite direction from where we need to be moving.

#### Transport

- Set emissions standards for vehicle imports, for example as in the EU.
- Take steps to encourage the use of electric vehicles.
- Provide some of the revenue raised from carbon charges to local councils to fund improvements in public transport, cycleways and walking paths; or alternatively allow local councils to use road tolls, congestion charges or petrol taxes for this purpose.
- Plan to improve the passenger rail system between major cities asap.
- Plan to improve the ability to transport goods between major cities via the rail system, including full electrification of the main trunk line, asap.
- Review all plans for new roads and highways to reflect the expectation that traffic flows are likely to fall and that strong investment needs to be made in alternative transport options.

### Agriculture and forestry

- Provide the necessary incentives for farmers to continue with steps to reduce emissions, such as:
  - Reducing the time cattle spend in wet areas through use of stand-off pads, herd homes, improved soil drainage, and via other approaches.
  - Fencing off and planting around water ways.
  - Reducing the use of manufactured fertilisers with high carbon footprints and high nitrogen contents, and replacing them with more environmentally friendly alternatives.
  - Moving away from very high stocking levels that have little or no effect on profitability because of the associated cost of extra fertiliser and supplementary feeds.
  
- Continue to support and encourage research and development work related to reducing agricultural emission including:
  - Breeding animals that produce lower emissions.
  - Testing and developing possible methane and nitrous oxide inhibitors.
  - Doing further research and test work on the use of organic and biochar additions to the soil to reduce nitrous oxide emissions.
  
- Develop and implement the necessary tools and processes to allow:
  - Routine assessment of methane and nitrous oxide emissions on individual properties so that assistance can be given if needed and emissions charges can be applied where appropriate.
  - Classification of animals offered for sale so that purchasers can opt to purchase stock that produce low methane emissions.
  - Implementation of new methods of emissions reduction once proven.

### Other

- Make climate change considerations an acceptable argument when considering resource consents or other methods of dealing with ventures that may have harmful environmental effects
- Continue current initiatives to reduce domestic and business reliance on external energy through use of insulation, solar water heating and solar power.

## **Appendix I - Responses to specific questions raised in discussion document**

The discussion document specifically raised five questions. The responses to these are given below. See also the text above for more information.

### **Q1 – Objectives for the contribution**

#### 1. A fair contribution

Fairness is not the driving force here. We need to take urgent and effective action to reduce New Zealand's emissions, in line with the reductions needed internationally to hold global warming to below 2°C. And we need to strongly encourage other countries to do the same.

What we do should be independent of what happens internationally. Some countries have already demonstrated that they are likely to hold up the process of reaching international agreement, or will try to negotiate such agreement to a level that is not effective enough to meet the 2°C limit.

## 2. Managing costs and impacts

We certainly need to ensure that lower income people and households are not disproportionately affected. This can be done by returning revenue from carbon charges to them either directly or via tax reductions.

## 3. Guide New Zealand

What our objectives need to do is to produce the required emissions reductions to meet our targets.

### **Q2 – The level of targets we set**

It is not just New Zealand's emissions and economy that need to be considered. It is also New Zealand's highly advantageous position as a developed country with an abundance of untapped sustainable energy sources.

### **Q3 – Appropriate level of cost for New Zealand**

It is obvious that things will need to change, but setting targets based on what would be a reasonable level of reduction in household consumption is inappropriate for several reasons.

1. We need to make emissions reductions, even if they result in quite large changes in household income.
2. At this stage we don't clearly know what the effect of these emissions reductions will be. There will be positive as well as negative effects.
3. "Household consumption" will very likely need to fall throughout the world. This does not necessarily mean that people will be worse off though, in the broad sense. For example, we may reduce emissions by moving to better quality goods that last longer and are easier to repair; and by developing transport systems that allow people to get to work faster and at lower cost. These sorts of reductions in consumption are a win-win.

Other countries have already shown that emissions reductions are possible. For example, Sweden has reduced its gross emissions by around 20% since 1990 and the Swedish economy remains strong. New Zealand's gross emissions increased by around 21% over the same period.

### **Q4 – What opportunities are important for New Zealand?**

The listed ones are all important, but there are also some important ones missing.

1. Reduced spending on energy imports - We currently spend over \$7 billion a year on fossil fuel imports – about half of what we earn from our largest export – dairy products. A good objective would be to plan to phase out these fossil fuel imports entirely by 2050 and meet our remaining needs from domestic sources.

2. Creation of new enterprises and new employment opportunities - For example:

- Further development of our solar, wind, geothermal, tidal and hydro energy resources, including domestic use.
- Development of wood waste and biofuels to give us sustainably produced alternatives for providing heat and energy, and powering vehicles.
- Further development of our transport systems that allow people to travel more quickly, at lower cost and with lower emissions.

3. New exports - We may be able to export biofuels and energy from other sources. For example, the potential for electricity generation from tidal power in Cook Strait is huge. This electricity could potentially be exported via a cable to Australia. As a country with much experience in harnessing renewable energy, we may also be able to export our knowledge more widely.

#### **Q5. Taking into account future uncertainties in technologies and costs**

There are always uncertainties in the future, but these may well lead to a need for faster change, not slower change. The actions needed to meet the 2°C target may become more demanding as time passes. Also, it may subsequently be decided that this limit is too high, as many scientists are already saying.

Hence for now we need ambitious targets which can be expected to at least meet the need to hold global warming below 2°C based on currently available information.

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