Green

Yes we can! A plan for significantly reducing greenhouse gas emissions

Options for domestic climate action to achieve a target of 40 percent below 1990 levels by 2030

Green Party discussion paper, September 2015

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Green Party of Aotearoa New Zealand

Preface

In December 2015, representatives from governments across the world will gather in Paris to negotiate a global climate agreement. At these negotiations, New Zealand will be asked what we, as a nation, are willing to do to reduce our greenhouse emissions.

The answer to this question will define us. Are we going to do our fair share, or are we going to sit on our hands while we ask other countries to solve the problem for us?

The National Government's provisional target of an 11 percent reduction below 1990 levels by 2030 does not even come close to doing our fair share. If all countries followed New Zealand's lead, catastrophic climate change would be the result.

New Zealand can do so much better.

Our fair share is at least a 40 percent reduction by 2030 on 1990 levels. Despite the National Government's excuses, New Zealand can commit to this ambitious target. This is entirely possible, and it's the path our economy must take if we want a stable climate.

We can achieve a bold climate plan with vision, leadership, and Kiwi ingenuity.

This discussion paper is a pathway to reach a more ambitious emissions reduction target. It is possible, through domestic climate action, for New Zealand to achieve a target of 40 percent by 2030.

It's time for a climate plan that New Zealand can be proud of.

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Summary

Climate change is the biggest issue of our time. New Zealand has the opportunity to show leadership while transitioning to a cleaner, fairer, smarter economy and a more prosperous future.

This discussion paper clearly sets out the steps the Government can take to achieve a climate plan New Zealanders can be proud of - a plan that sees our greenhouse pollution drop by a respectable 40 percent below 1990 levels by 2030.

This target is the same as put forward by the European Union and puts us broadly on a straight-line path to being a (net) zero emissions economy by 2050.

We outline economy-wide policies that the Government can implement to reach a more ambitious target:

- A Climate Commission to assess the government's progress on meeting targets and provide advice on improvements;
- A 'Climate Tax Cut' that puts a price on greenhouse gas emissions (except from agriculture) and recycles the revenue back to householders and businesses via tax credits
- A Green Investment Bank: to stimulate growth in low emissions economic activity.

This discussion paper also outlines new analysis that shows where emissions reductions can come from, sector by sector, and the policies to get us there. The policy details of each sector are elaborated on in appendices attached to this discussion document.

Introduction

Climate change is the most challenging economic, environmental, and public health issue of our time.

The 800 scientists who produced the most comprehensive assessment of climate change ever undertaken – the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report – conclude that climate change threatens irreversible and dangerous impacts. But, options exist to limit its effects - if countries work together to take climate action.[1]

All we need is the political will.

In December 2015, representatives from countries across the globe will gather in Paris to discuss how to keep our greenhouse gas emissions to a level that will stop global warming at 2°C – the threshold that the international scientific community has specified for averting 'dangerous' climate change.[2] In advance of this meeting, countries have agreed to publish to what extent they will each reduce their post-2020 greenhouse gas emissions – a commitment known as their Intended Nationally Determined Contributions (INDC).[3]

In July 2015, the National Government announced a provisional INDC of 11 percent below 1990 levels, saying that anything more is too difficult because 50 percent of our greenhouse gas emissions come from agriculture. The Government claims that in the absence of technologies to reduce agricultural emissions, New Zealand cannot meet an ambitious climate target.

The Government's target is woefully inadequate and has been criticised across the spectrum, from health professionals, international analysts, newspaper editors, scientists, business leaders, conservation groups, to ordinary citizens.

Climate scientist Professor James Renwick of Victoria University of Wellington said, "if all countries followed New Zealand's lead, we would be in for very significant climate change impacts and catastrophic damage to the New Zealand and global economy."[4] This means that to limit global warming to 2°C, other countries will have to pick up New Zealand's slack.

The National Government's provisional INDC of 11 percent below 1990 levels by 2030 should be put into context. The Government already has a pre-existing unconditional commitment to reduce New Zealand's greenhouse gas emissions by 5 percent by 2020 and 50 percent by 2050.

Despite these previous emissions reduction commitments, New Zealand is continuing to move in the wrong direction under National. The latest figures show that New Zealand's net emissions *increased* 13 percent from 2008 to 2013.

What's more, the National Government has not released a plan for how they will get emissions to plateau, let alone decrease. The Government seems to be relying on 'creative accounting', like buying offshore credits, to meet its international climate commitments. What we need is a plan for how New Zealand will actually reduce our emissions.

This Government's decision to put no effort into reducing emissions is a strategy that puts New Zealand at a distinct long-term disadvantage. Nearly all economists agree that the longer a country delays the transition to a low carbon economy, the greater it will cost.

New Zealand will reap significant benefits from an ambitious emissions reduction target that is met through domestic action. With the National Government, we are stuck with a backwards and hands-off approach that will leave us behind.

> ***"Countries around the world can move their economies onto a path that cuts net emissions of climate-changing gases to zero at an affordable cost but they should start now."***
>
> – The World Bank

Global emissions must reduce towards zero by 2100 or earlier to have a likely chance of keeping global warming to less than 2°C and avoiding the worst effects of climate change.[5]

For the sake of future generations and other life on the planet, we have a responsibility to address climate change. Taking action on climate change also presents a unique opportunity to transition to a cleaner, fairer, smarter, and more prosperous future.

This Green Party discussion paper shows that we can reduce New Zealand's net annual greenhouse gas emissions to no more than 40 Mt of CO2-equivalent by 2030, even if there was a five year transition period for the farming industry. This is an emissions reduction of at least 40 percent below the 1990 gross emissions level and would put us broadly on a straight-line path to being climate neutral (zero net emissions) by 2050.

This plan includes economy-wide policies previously released by the Green Party, as well as new sector-specific analysis in electricity, transportation, other fossil fuel combustion, waste, industrial processes and product use, agriculture, and forestry. The calculations in this paper are drawn from a background research paper that will be released as part of a parliamentary conference later in the year.

The National Government, with all its Ministry researchers, consultants and analysts, has access to mountains of information that would be helpful in the discussion on climate change. Unfortunately, the Government has been very wary of releasing the information it has, and when it does release documents, they are often riddled with redactions. This Green Party climate discussion paper is produced using the best information we can get our hands on, and has been reviewed by experts. It's a starting point - designed to open up the discussion.

This discussion paper is not what the Green Party would do if we were in Government. It is an attempt to overcome a political road block to climate action, put in place by the National Government. A Green Party climate plan for 2017 could look different. Not just because the political environment will likely have changed, but also because for every year we delay climate action, the more action we will need to take later on.

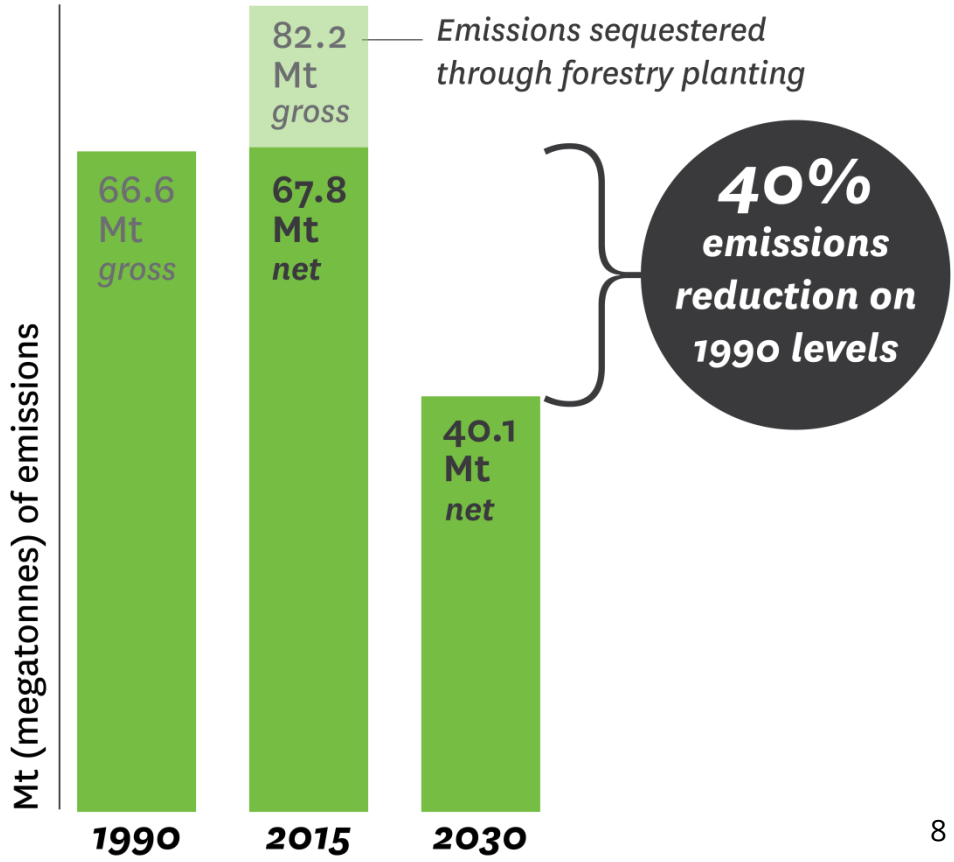
A climate plan New Zealanders can be proud of

To show that a 40 percent reduction by 2030 is achievable, we have detailed where emissions reductions could come from, and the policies to get us there.

There are three overarching policies that can help reduce emissions across the board: creating an independent Climate Commission, putting a strong price on carbon, and establishing a Green Investment Bank.

These are policies that have previously been announced by the Green Party, and are each economy-wide measures that will hasten the shift to a low carbon economy.

We have also brought together analysis of the electricity, transportation, other fossil fuel combustion, waste, industrial processes and product use, agriculture, and forestry sectors, to outline a plan of reducing our domestic emissions to the required 40 percent below 1990 levels by 2030.



The New Zealand Climate Commission

To tackle climate change, we need an independent agency to assess the progress of the government's climate policies and, if needed, to provide advice on how to adjust them to meet our targets.

New Zealand can follow the lead of the United Kingdom and establish an independent Climate Commission to become New Zealand's foremost authority on climate change. Comprising recognised experts on climate change and macroeconomic policy, the Commission's role would include setting the ongoing price of carbon, and recommending complementary measures for greenhouse gas emissions reduction in order to meet our targets.

The Green Party has committed to setting up such a commission and to implement its recommendations.[6]

Price on carbon: A 'Climate Tax Cut'

Numerous reports, including from the OECD, conclude that a price on greenhouse emissions is necessary to reduce emissions at the lowest cost. In New Zealand, a price is put on greenhouse gas emissions through the Emissions Trading Scheme (ETS), first implemented in 2008. However, the National Government's ETS settings are so weak that emissions have actually increased by 13 percent since the scheme was launched.[7]

New Zealand's environmental watchdog, the Parliamentary Commissioner for the Environment has said, "unfortunately the ETS is currently little more than a framework. Excessively generous allocations of free carbon credits (subsidies) to major emitters and very low carbon prices mean that the ETS has been ineffective in encouraging the reduction of greenhouse gas emissions within New Zealand."[8]

Even worse, the ETS has sometimes acted as a reward for pollution, with companies able to profit from trading the free credits they are allocated.

To make a real difference to our greenhouse emissions, the Government can scrap the ineffective ETS and implement a revenue neutral carbon tax. The Green Party announced such a policy in 2014.[9] We suggested a tax of $25 per tonne for all sectors, except for agriculture, which we suggested could start with a price of $12.50.

To reach our 40 percent by 2030 target, the Climate Commission would need to significantly increase the carbon price over time. However, starting low and increasing the price over time allows businesses the time to adjust to the new tax and make decisions accordingly.

The Green Party has also proposed recycling the revenue from a carbon tax back to households and businesses in the form of tax credits. Business and Economics Research Limited (BERL) modelled the effects of the Green Party's Climate Tax Cut policy and found that the average household would be $319 better off under the 2014 policy. BERL said, "households will pay more for some of the commodities they consume

but income tax reductions would more than compensate for any price rises."[10]

A carbon price works to reduce greenhouse gas emissions because it provides a financial incentive for businesses to cut their emissions. Each carbon emitting company will look at cost effective ways to reduce carbon emissions in order to minimise the amount that the company has to pay under the carbon tax.

With a price on carbon, technologies that currently can't quite compete with fossil fuels will become cost-effective, and the price will incentivise the development of new technology to replace fossil fuels further.

Furthermore, a price on carbon will make energy efficiency more profitable - people will respond to the incentive to not waste energy.

Green Investment Bank

A Green Investment Bank could accelerate New Zealand's transition to a low carbon economy. A government-owned, for-profit, Green Investment Bank[11] would partner with the private sector to fund new projects ranging from renewable energy and biofuel production to new clean technologies. The OECD's work has found that green banks play an important role in mobilising private and public sector capital into sustainable transition.[12]

We estimate a Green Investment Bank will cost $20 million to establish over three years and initially have a $100 million line of credit. This can be funded from oil royalties, which the Green Party believes should increase. Ending fossil fuel subsidies and raising the overall tax take from oil companies from the current 46 percent to the global average of 70 percent would give the Government more than enough money to cover the initial outlay of capital.

In time, a Green Investment Bank would see billions of dollars of (mainly) private sector finance invested in new renewable energy plants, solar panel installations, energy efficiency retrofits, the development and production of significant volumes of biofuels, and clean technology projects - all helping to reduce greenhouse gas emissions.

Sector by Sector Policies

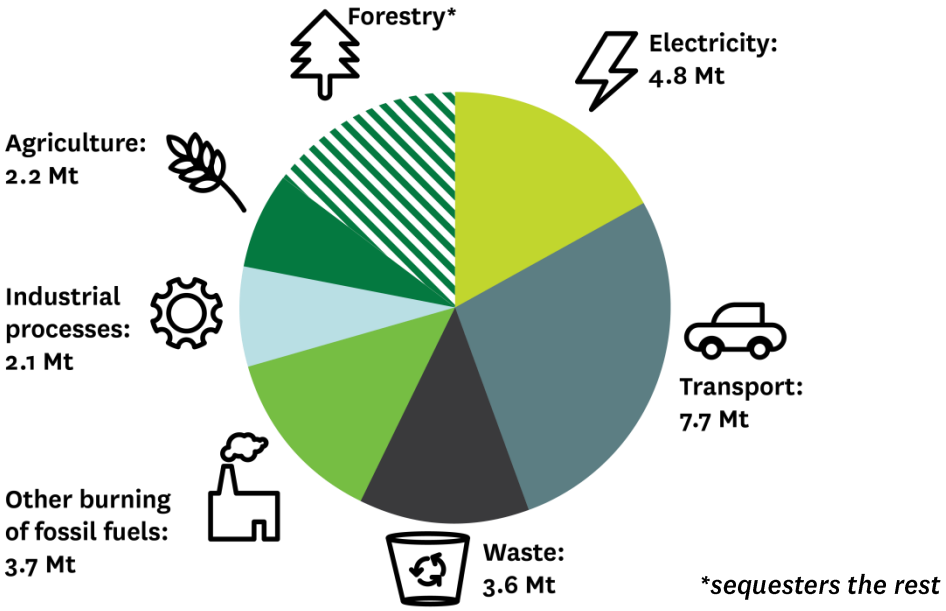
These economy-wide measures are necessary, but not sufficient to achieve an ambitious emissions reduction target. We also need sector-specific policies targeting many different levers for change.

We have brought together analysis of the electricity, transportation, other fossil fuel combustion, waste, industrial processes and product use, agriculture, and forestry sectors, to outline a plan for reducing our domestic emissions to the required 40 percent below 1990 levels by 2030.

For each sector below, there is a detailed appendix explaining the methodology used to derive the emissions reduction figures. The headline numbers indicated for each sector are annual net emissions reductions by 2030 relative to today's levels. The precise figure for New Zealand's net emissions for 2015 is not available yet, but we estimate this at approximately 68 MtCO2-e.[13]

This means that to reach the 40 percent reduction target off the 1990 level of 66.6 Mt, we need to achieve a reduction of around 28Mt from today's level.

We can reduce our domestic emissions and achieve this target by taking significant, yet necessary, steps in each of these sectors.



Electricity - We can cut 4.8Mt off 2015 levels by 2030

The Government has a target of producing 90 percent renewable electricity by 2025. The Green Party believes we can set our sights higher, and achieve 100 percent renewable by 2030.[14] Achieving 100 percent renewable would require us to stop burning coal or natural gas for electricity generation. The last coal fired power station is set to close in 2018[15], so the remaining challenge is phasing out the production of power from natural gas.

Research from the University of Canterbury shows that 100 percent renewable electricity is feasible without compromising security of supply, even in a dry hydro year.[16] There are over 3700MW worth of consented renewable power plants that are waiting to be built, and the Green Party's Solar Homes[17] and Solar Schools[18] policies would encourage even more. These policies will provide low-cost loans to enable households and schools to invest in solar panels to enjoy sustainable power for decades. Furthermore, biomass-fuelled gas turbines and demand-side measures such as load shifting are all viable options to manage peaking requirements.

The Government can support energy conservation and distributed generation through initiatives that the Green Party has previously promoted, including:

- Smart Grid technologies;
- Real time electricity pricing;
- Limited fixed lines charges;
- Requiring electricity retailers to pay a fair price for those feeding-in electricity with grid-connected renewable generation.

Transport - We can cut 7.7Mt off 2015 levels by 2030

We can have more reliable and cleaner transport whilst also cutting emissions. To give people better transport choices, money can be reallocated from the Land Transport Fund that is currently earmarked for new motorways and instead invested in low-carbon alternatives like fast, reliable buses and trains, as well as safe, separated walking and cycling facilities.

An option to the Government would be to implement the Green Party's dedicated transport plan for Auckland - a comprehensive transport network with integrated trains, buses, and ferries that will make getting around Auckland faster, easier, and cleaner. The plan reallocates $1.3 billion from the Land Transport Fund to capital investment for the City Rail Link (60 percent of the cost), and $825 million into dedicated busways and city bus centre improvements.[19]

Compact urban form makes it easier for people to get around and live without a car, and makes public and active transport more viable. Government support for smart, compact urban development through policy design can help cut transport emissions.

The Government can also cut transport emissions while making it easier for school kids, tertiary students, and apprentices to travel to their studies. The Green Party has a Safe to School policy that would allocate $50 million each year for four years to build safe cycling and walking infrastructure around schools. We also have committed to a Student Green Card policy that entitles all tertiary students and apprentices in New Zealand to free off-peak travel on buses, trains, and ferries.

With these policy measures in place we can expect New Zealand's car travel to decrease by 2 percent per person per annum (it has already been falling at an average of 1 percent per person per annum for the last decade). This will create substantial emissions reductions, but even further emissions reductions are possible if the transition to a more climate-friendly vehicle fleet is incentivised through the introduction of fuel economy standards for vehicle imports, and by incentivising the uptake of electric vehicles.

If we implemented the policies above and reduced the emissions from our car fleet to 100g/CO2/km we could cut our annual transport emissions by **4.9Mt** below 2015 levels by 2030.

The 100g/CO2/km emissions standard for our car fleet is achievable if the Government implements the European Union's new vehicle standard of 95g/CO2/km by 2021. This would need to be followed by a transition to nearly 100 percent of new vehicle purchases being electric by 2030, while allowing used vehicle emissions standards to lag five years behind, and an increase in our vehicle turnover between 2020 and 2030. This is a realistic scenario if battery costs continue to decrease and new vehicle ownership models (e.g. car sharing) encourage a faster transition to electric vehicles.

The Green Party has promised to speed the transition of the private vehicle fleet to electric by investing $10 million into the roll-out of fast-charging electric car refuelling stations across New Zealand and $10 million in cash-back payments to electric car buyers over time. We will also lead by example and replace the Crown fleet (where appropriate) with zero emission electric vehicles, starting with the limousines. Furthermore, we would enable workplace charging across the government sector.

The Government can cut a further **2.8Mt** per year in the transport sector by reducing emissions from freight through the use of biofuels. Road freight volume and emissions have grown hugely since 1990, and while they stalled in 2007, they have begun to increase again. In contrast, aviation, marine and rail have all maintained relatively flat emissions in recent years, and with a decent price on carbon this is likely to continue.

In order to reduce emissions from road freight, the Government can assist the mode shift to rail and support the uptake of biofuels. If the road freight industry were able to use 40 petajoules of biofuels per year, then freight emissions would reduce from 5.5 Mt CO2-e in 2015 to 2.7Mt CO2-e in 2030. Additional reductions would be gained through a shift to rail. Fuel demand could be kept flat through a combination of mode shift (more rail and coastal shipping) and efficiency gains.

Other combustion of fossil fuels – We can cut 3.7Mt off 2015 levels by 2030

This category covers the combustion of fossil fuels for all purposes beyond electricity generation or transport. The main source of emissions in this category is the combustion of fossil fuels for industrial heat, for example, in the production of milk powder.

There are steps we can take to make our industries more climate friendly. For example, the German Aerospace Centre argues we can save **3.7Mt** of emissions if we reduce the use of thermal coal by 90 percent, reduce non-transport liquid fuel consumption by 40 percent, and keep gas consumption steady to 2030. The majority of thermal coal use is in the food processing sector to provide heat for drying milk. This happens especially in the South Island where there is no reticulated gas supply.

A strong price for carbon would incentivise the switch to carbon neutral geothermal heat, electricity, or biomass like woodwaste. Further gains can be made through energy efficiency, combined with large growth in the use of heat pumps, geothermal heat and solar collectors to provide low-grade heat.

Industrial processes – We can cut 2.1Mt off 2015 levels by 2030

Emissions in this category aren't due to the burning of fossil fuels, but rather due to non-combustion industrial processes that emit greenhouse gases as a by-product, such as in the manufacture of steel, aluminium and concrete. Emissions of fluoro gases, called F-emissions, are also in this category. Fluoro gases are mainly used in refrigeration and air-conditioning, but are also used for some niche applications.

The European Union has introduced a package of regulations to cut total F-emissions by two-thirds from 2014 levels by 2030. The New Zealand Government could adopt these regulations as well, which would reduce our annual F-emissions by **1Mt** below 2015 levels by 2030.

New Zealand can cut CO_2 emissions from industrial processes by one-third by 2030 (**1.1Mt**) assuming that the Tiwai Point aluminium smelter is closed by its owner by 2030 and if we adopted new technologies in steel manufacturing. Examples of such technologies include New Zealand-developed CO2 capture and 'green coke'. Lanzatech has demonstrated a successful pilot at the Glenbrook Steel Mill in which they captured one-third of the CO_2 produced in steel production and converted it to ethanol, displacing fossil fuel use. Another New Zealand company, Carbonscape, is developing technology to produce 'green coke' from biomass, which could replace coking coal as a reducing agent for steel production.

Other process efficiencies driven by a carbon price and other measures could also contribute to emissions reductions. Structural changes to the economy such as a decline in the demand for cement and steel by replacing them with engineered laminated wood products, could also contribute.

Waste – We can cut 3.6Mt off 2015 levels by 2030

New Zealand's waste emissions per capita are the second highest in the developed world and are more than double the average. Several other countries (Austria, Belgium, Germany, Netherlands, Sweden and the UK) have successfully reduced their waste emissions by more than 50 percent since 1990.

The UK has reduced waste emissions by 67 percent since 1990.[20] Emissions were approximately flat to 1999, meaning this reduction has occurred over a period of roughly 15 years. This is almost entirely due to reduced methane emissions from landfill sites. Biodegradable waste sent to landfill has reduced by 70 percent since 1990, and the overall methane capture rate at landfills is estimated to have increased from 1 percent in 1990 to 61 percent today.

Based on this, it should be achievable to reduce New Zealand's waste emissions by 40 to 70 percent by 2030, which would deliver a reduction of up to **3.6Mt**CO2-e.

Greenhouse gas emissions from waste are primarily methane caused by anaerobic degradation of biodegradable waste disposed in landfills and farm dumps. These emissions can be cut by reducing the quantity of biodegradable waste created and disposed of (including through increased recycling and composting), and increasing the capture of methane at landfill sites and through use of biodigesters, particularly on farms.

The biggest problem for New Zealand is smaller, unmanaged waste disposal sites, such as farm dumps, which contribute 55 percent of total emissions from solid waste. Farm dumps are estimated to be around 60 percent of this. Government could phase in regulation of these sites.

Agriculture - We can cut 2.2Mt off 1990 levels

There has been reluctance by government to put a price on agricultural emissions. This reluctance has led to the Government giving agriculture a free pass for an indefinite amount of time. However, we cannot allow this special treatment forever.

The Green Party's preference would be to incentivise climate-friendly farming by putting a charge on dairy emissions at $12.50 per tonne − equivalent to a reduction in the Fonterra pay-out of 8 cents per kilogram of milk solids.[21]

Given the urgency and value of a cross-party agreement on emissions reduction, the Green Party would accept a five year transition period for agriculture if National committed promptly to a 40 percent cut in New Zealand's emissions by 2030.

This would recognise that agriculture must eventually do its share to help New Zealanders achieve a cleaner economy. The five year window for agriculture to reduce its emissions below today's levels would allow it time to transition while keeping New Zealand moving towards our main goal - reducing our emissions and doing our bit to limit climate change.

The Green Party proposes that, in 2020, the Climate Commission would be tasked with setting policy to reduce agricultural emissions by at least **2.2Mt** below 2015 levels by 2030. This is a modest reduction compared to the other sectors.

There is every possibility that agriculture will be able to make these modest reductions without government intervention via the Climate Commission.

There is evidence that New Zealand dairy farmers have been overstocking their farms, at the expense of the environment and their pockets.

Dairy NZ scientist John Roche says between 2003 and 2013 the average dairy farmer added 100 cows to their herd - but he says they're no

better off financially because they have to spend more on inputs such as supplementary feed.[22]

If the dairy industry takes steps to unwind its unprofitable trend towards ever-increasing intensification, then New Zealand may be able to meet the target of 2.2Mt below 2015 levels without government intervention. Already the recent dramatic drop in the dairy price has led to some de-intensification.

Low dairy prices are getting farmers to think about farming less intensively. The executive director of MyFarm, one of the country's biggest farm owners with about 40 farms and 30,000 cows, has said it was actively discussing "winding back the clock" with investors to a different farm system that better suits lower, or more variable milk prices.[23] This season MyFarm is culling more cows, reducing off-farm grazing, cutting back on feed supplements, and putting fewer cows on the land. It looks set to continue lower-intensity farming in the future. This new approach will mean that the land will be farmed less intensively. A typical 200ha farm will carry 525 cows, down from 600.[24]

If this decrease in cow numbers is replicated in 2,400 of the 4,000 similar sized (200+ ha) dairy farms in New Zealand, while all other farms keep their livestock at 2015 levels, then agriculture would more than meet its required 2.2Mt emissions reduction.[25]

If farmers are moving back to a low input, low intensity approach, then the step to being fully organic is not large. Global demand for organics is rising year on year, and provides New Zealand with a great opportunity to maximise value, not volume. Currently, Fonterra pays its organic milk suppliers a premium of $1.75/kg on top of its forecast payout of $3.85/kg for conventional suppliers.[26] Internationally, the price for organic whole milk powder can be five times that of conventional milk powder - both Fonterra and New Zealand would be better off if organic conversions increased.

Forestry – We can sequester the remainder needed to meet the 40 percent target

Combined, the cuts outlined in the previous sections add up to a total emissions reduction of 24.1Mt from today's level. All other things constant, that is equivalent to a 2030 target of 35 percent below 1990 levels.

However, projected growth in net emissions from forestry, due to the harvesting of crop forests planted throughout the 1990s, threatens to undermine all those emissions reductions. These crop forests have been acting as a short-term carbon sink and obscuring the rise in New Zealand's gross emissions. As they are harvested over the next 15 years, these forests become a huge liability and a challenge to achieving a strong 2030 emissions reduction target.

Fortunately, our analysis shows that it should be possible to counteract this extensive harvesting, and sequester enough carbon to meet the 40 percent reduction target.

For the other sectors, we have simply looked at the single year emissions value in 2030. In fact, New Zealand's 2030 emissions target will be converted into a total cumulative 'emissions budget' for the years 2021-2030. For forestry, it is necessary to take a different approach because looking only at 2030 can obscure the full picture when we consider the longer cycle of planting and harvesting.

For a 40 percent target, we calculate a total 2021-2030 budget of around 490Mt. If we achieve the emissions reductions in all the sectors discussed above, our total gross emissions over the 2021-2030 period would be around 653Mt. This means we would need net sequestration (or removals) of around 163Mt between 2021-2030 from forestry to meet our 40 percent reduction target.

According to the latest official projections by the Ministry for the Environment, on our current path, forestry will in fact be a source of 52Mt of net emissions over the 2021-2030 period. This gives a total gap of 215Mt to be reduced.

This gap can firstly be reduced by limiting deforestation and conversion of existing forest land. The Deforestation Survey 2014, undertaken for the Ministry of Primary Industries, projects deforestation of around 5,000ha per year from 2020 onwards (mostly pre-1990 forest land to be converted to dairy). We assume that under a strong carbon price and other policies to contain dairy expansion, this could be reduced by 50-100 percent, reducing total emissions over the 2021-2030 period by 20-40Mt.

Second, we can offset the effects of the coming harvest through new planting on land currently used for other purposes. Work commissioned by the Green Party, as well as other research, shows that New Zealand has over 1.3 million hectares of Kyoto-compliant marginal land available for planting. Some of this land has exotic vegetation cover, while other marginal land has indigenous biodiversity values.

The Green Party would strengthen the National Environmental Standard for Plantation Forestry to protect areas of indigenous vegetation from being overplanted with exotics, strengthen sustainable forest practice, incentivise planting in native tree species, and incentivise the planting of appropriate places with *Pinus radiata* and other exotics species.

If New Zealand immediately embarked on a major planting regime of trees, we could sequester the required amount of carbon to meet the goal. Planting 50,000 hectares annually of permanent pine forest from now until 2030 would sequester about 180 Mt. The use of native species would require substantially more land than 50,000 hectares annually because of the lower sequestration rates of indigenous species in the short term. It is important to ensure that the planting, by species, is undertaken on the most appropriate land.

Another scenario, promoted by the New Zealand Farm Forestry Association, is to plant 100,000 hectares of pine forest from 2017-2027. This scenario would sequester 175Mt. This second scenario requires more land because the trees would be planted further apart allowing for harvesting and pruning, and also because the trees are planted later, and therefore sequester less carbon. This scenario would also mean less marginal land was available for native afforestation or

encouraging native regeneration with the co-benefits this has for indigenous biodiversity.

Combining the potential for reduced deforestation and new afforestation, we find that it is possible to achieve the net emissions reduction of 215Mt needed to meet the 40 percent target.

The Green Party acknowledges that the removal of livestock will have economic consequences for the farmers involved. However, we would incentivise the planting of these permanent forest sinks through the Afforestation Grant Scheme and the Permanent Forest Sink Initiative. We would also grant sequestration credits, to be set by the Climate Commission. We know from industry modelling that farmers will consider planting their marginal farmland at $16 a tonne.[27]

There are many direct benefits of retiring marginal pastoral land: erosion mitigation and soil conservation, improved water quality in downstream waterways, increase in indigenous biodiversity, and opportunities for local enterprises based on honey and plant-oil extracts from manuka/kanuka regenerating shrubland.

Conclusion

We can have a climate plan that works - one that New Zealanders can be proud of.

We can achieve an ambitious emissions reduction target if we have vision, leadership, and Kiwi ingenuity.

Under this National Government we are lagging behind. They have chosen to set one of the world's weakest climate targets, complaining that anything more is too hard. Not only is their target weak, they also don't have a plan to get us there.

We know that New Zealand can lead.

We have done it before and we should do it now.

Small well-off countries like New Zealand have an opportunity - in a way that large or poor countries don't - to be nimble and quick and lead the way.

Providing global leadership by setting an ambitious target only increases the likelihood that big countries, on whom we are reliant, will also commit to ambitious action – and together we will avoid catastrophic climate change.

There is no moral case for us to continue to have the fifth highest per person emissions in the world, especially when we have been benefiting from our use of fossil fuels to achieve some of the highest standards of living in the world.

We cannot justify sitting on our hands and waiting for others to lead. It is our responsibility to set an ambitious target.

This target has to be at least a 40 percent reduction below 1990 emission levels.

But what use is a target without a plan to achieve it?

We need a plan to reduce our emissions, not just a costly strategy of buying our way out of our obligations.

As low as it is, even the National Government's target can't be reached because they have no plan to do so. They are likely to rely heavily on the purchase of overseas credits, opening New Zealand up to a multi-billion dollar bill.

A strong plan to cut our emissions is achievable. A Climate Commission can help us get there, as well as a Green Investment Bank to stimulate growth in low emissions economic activity. These will sit alongside a revenue-neutral Climate Tax Cut that puts a price on greenhouse gas emissions, and recycles the revenue back to householders and business via tax credits.

The benefits of taking strong action now will be significant and long lasting.

The National Government would have us believe that addressing climate change will require huge economic sacrifice and provide no benefits. They argue that we should take it slow and follow along behind other countries. But that's not true. By showing leadership and taking action, we can have a more prosperous New Zealand now, and leave a stable climate for the future.

The transition to a net carbon zero economy is inevitable. The debate is only about timing. World leading economists all agree that the countries that transition first will be the most prosperous as the costs of transition continue to increase over time.

> ***"It is possible to create jobs, reduce poverty, and reduce the carbon emissions that threaten our future. To achieve this we must make fundamental changes and smart choices."***
>
> - Felipe Calderón, the Chair of the Global Commission on the Economy and Climate[28]

The National Government has chosen to view action on climate change solely as a cost. In fact, in their modelling they have only looked at the costs of climate mitigation, completely ignoring the many benefits of avoiding climate change.[29]

If we have a real action plan to cut our emissions, there are all sorts of benefits to be gained, even putting aside the main benefit of avoiding catastrophic climate change. Having a strong domestic plan will get us closer to our non-negotiable goal of net zero emissions for New Zealand while creating jobs and wealth for New Zealanders in the process. For example:

- The Government's only plan is to purchase offshore credits at $50 a tonne.[30] We know from the industry that farmers will consider planting trees on their marginal farmland at only $16 a tonne. So instead of sending the money offshore, why not spend it here where it will create jobs for New Zealanders, and keep the money onshore?

- If we improve the fuel-efficiency of our entire vehicle fleet by 20 percent we could save around $2 billion in annual fuel costs to the economy.[31]

Under these policies, we will have more vibrant, greener cities, where public transport is fast, clean, and affordable. Kids will be able to walk and cycle to school safety, freeing up the roads for commuters. And our

exporters will be more credible selling their goods to the world under New Zealand's 100% Pure brand.

Agriculture is not the block to achieving a responsible climate target - the block is political will from this National Government.

This plan recognises that agriculture must eventually do its fair share. We have proposed a five year window, before requiring agriculture to reduce its emissions. This way, farmers will have time to transition while keeping New Zealand moving towards our main goal - reducing our emissions and doing our bit to reduce global warming.

There is no price you can put on leaving a stable climate for our children and their children.

Action on climate change is a win-win for people and the planet, now and into the future.

Can we do it?

Yes we can – and we must.

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This figure was derived from data in New Zealand's Greenhouse Gas Inventory 1990-2013. Between 2012 and 2013 the dairy cattle population increased by 37,920 cows, and emissions from dairy cattle increased by 0.467Mt (p 123). Using this ratio we calculate that to reduce 2.2Mt we would need a decrease in the cow population of around 180,000 cows. This would require only 2400 dairy farms to decrease their herd size by 75 cattle.

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