

# **Submission on the NZ Productivity Commission's Low-Emissions Economy: Draft Report**

Wiremu Thomson (14/06/18)

I welcome the opportunity to make a submission on the NZ Productivity Commission's Low-Emissions Economy: Draft Report. I appreciate the depth of information provided in the draft report in informing debate on climate change mitigation policy. I am generally supportive of the report, however there are some areas where I disagree and these will be the focus of my submission along with comments in other areas.

Areas I will be commenting on are:

- Hypothecation to households makes little sense (I completely disagree)
- Forestry in the ETS
- Free allocation of NZUs
- Electric vehicles
- R&D funding
- The benefits of cycling, public transport and walking
- Urban form
- Transition risks
- Carbon Capture and Storage
- Aviation and shipping bunkers
- General comments about the report

In considering my submission, it may be helpful to consider my goals:

1. I want the domestic economy to see the full effect of an emissions price, including from emissions generated overseas for products consumed domestically, as otherwise it is hard to see NZ transitioning to a sustainable future.
2. I want climate change mitigation to have as little effect as possible on NZ's position in the international economy as otherwise it would be hard to see NZ transitioning to a sustainable future we would want to be a part of.

I have also included how I would implement an ETS as appendix A, and my submission to the Ministry of Foreign Affairs and Trade's consultation on priorities in international climate change negotiations as appendix B, because an example of how things might go internationally may help in forming domestic policy.

## Hypothecation

I completely disagree with the hypothecation part of the report.

As far as I can tell, there is no citation for the claim "Hypothecation makes most sense where the link between the taxed activity and subsequent expenditure is strong". All the Tax Working Group is saying is that hypothecation can make a tax more politically acceptable, which is what giving the revenue back to people would do. The goal isn't necessarily to raise revenue, the goal is to put a price on emissions. Giving the revenue back to people allows a higher price to be set without significantly reducing the disposable income going round in the economy.

The report then goes on to suggest the National Land Transport Fund (NLTF) as a good example of hypothecation and yet later the report criticises the NLTF for not spending money on demand reduction projects such as rail infrastructure (it does fund public transport though. It also misses out on things like denser housing closer to where people want to be or moving destinations closer to transport hubs) because it is mostly ringfenced for roading projects, which is what I think the quote from the Tax Working Group is referring to when it mentions downsides.

## The case for hypothecation

Allocating most of the revenue to individuals as a dividend or Universal Basic Income (UBI) in the short-term could be very helpful.

- A) It makes it more politically acceptable because it is not necessarily a tax, more just putting a price on a negative externality. It becomes less of a tax on carbon emissions and more a tax on excessive consumption.
- B) It allows a higher (likely more accurate) price to be put on to start with as people will be less affected.
  - i. This resolves some of the discounting issues mentioned in the report's car buying findings about people not discounting the future cost accurately, and EVs having a higher price relative to fossil fuel vehicles.
  - ii. It provides greater reward for people making the effort to reduce emissions (makes lower-emission options more cost-competitive). People are paid to produce things, why not pay them to reduce emissions as well. If someone spending time waiting at a bus stop instead of driving is worth the reduced emissions why not compensate them an appropriate amount for it?

For example, say the average New Zealander is responsible for 10 tonnes each year. You want a gradual transition and not to shock the economy so you set the price at \$20 a tonne, so everyone is paying \$200 more a year. Some people will go "Ok, \$200 that's fine. It's \$200 less in my pocket but if it helps the environment and I don't have to do anything then that's great".

Whereas if you are allocating it back to people then you can set the price at say \$80 a tonne, but most people won't be paying more so you get "Ok, I get \$800 a year to cover the increased prices, but if I cycle to work, change my diet or wait 10 minutes for the bus each day then that's extra money I can spend on other things."

I have to point out that although \$80/t sounds extreme at today's prices, it is not necessarily the same as the \$80/t used in the modelling part of the report. The modelling does not give each person an emissions allowance to start with and so the modelled price needs to be less than the actual price because it would be unreasonable to expect people to instantly go from emitting 10 tonnes a year to close to 0 tonnes a year. Towards the long-term it would be similar as the emissions budget per person would head towards zero with any additional emissions to be offset by removals such as forestry. That being said the initial carbon price should probably be slightly lower than what it is actually worth, to give more time for those that are higher emitters to plan how they can reduce their emissions and maintain funds to make those changes (although if the price is widely announced in advance with certainty then this would also give time to plan).

Allocating revenue as a UBI can easily be explained by analogy, "When you were a child, your parents paid you pocket money. They could have spent this money on buying you junk food each week, but knew that you'd know better what you want and would rather spend it on toys." The UBI option sort of amounts to realisation of opportunity costs, if you give me the money and say this is how much something costs then I can go 'hmmm, maybe it would be better if I did things this way'. The other option is you're covering the cost and I remain completely oblivious to it.

Another form of allocating revenue back to people would be by reducing GST and this would reduce the effect on tourists. However, a UBI is a fairer distribution method because it provides the same benefit to everyone, except tourists, whereas reducing GST provides a greater benefit to those who spend more (and they are not necessarily the ones affected by the higher emissions price), and if someone is only in the country for a month then the increased cost would only be about \$80 (i.e. if they don't opt for high-emissions modes of travel) which is comparable to the tourism levy, so NZ could just reduce that to compensate.

If you don't recycle the revenue then it is a tax grab, taking money out of private spending and into the government's control. Businesses unrelated to climate change may close such as the local cafe, because people have less disposable income to spend.

The effectiveness in the long-term depends on how the tax is collected.

- A) If everyone is basically paying the same tax and getting the money back then the tax is just acting as a price to discourage excessive consumption.
- B) If some people are spending more money for the luxury of emitting more then it seems fair that others should be compensated for having to make adjustments to reduce their emissions.

- C) If some people are spending more money for emitting more out of necessity (e.g. lack of insulation) then there would be less sense in giving it to people emitting less.

Other examples of this form of hypothecation that I noticed in the report are the Waikato Regional Council's (WRC) nitrogen leaching trade system for Lake Taupo and the UK's Waste and Emissions Trading Act 2003.

I like WRC's approach to nitrogen leaching over Environment Canterbury's approach because the WRC avoids grandparenting, which is something a woman at the fourth Motu emissions mitigation roundtable was complaining about in regional council approaches to water pollution.

A tax and UBI is also pretty similar to the feebate scheme the Productivity Commission (NZPC) supports in transport policy with the emission benchmark being similar to the allocated emissions per person. I have to point out that this does not mean tax and UBI has the negative mentioned in the annual feebate scheme because in the tax and UBI case you only get charged for using the car, you could opt to cycle or take public transport.

### **Ringfencing**

I agree that the revenue not allocated as UBI should be ringfenced to emission reduction projects and R&D type things. However, this should not limit the government from spending additional funding from other revenue on emission reduction projects.

If it is better to spend the ringfenced revenue on other things then this might suggest the emissions price is too high or the allocated emissions per person is too low.

ETS revenue probably should not be mixed with core government revenue as there may be a tendency to dip into it for core expenditure and not spend enough on emission reductions.

### **Higher initial emissions price**

The fact that hypothecating can make the emissions price higher has advantages.

Although business tends to prefer a slower transition, this can put more of a burden on environmentally-conscious people in the form of decreased wellbeing and/or opportunities, and these people should be fairly remunerated for their efforts in reducing emissions. Voluntary action typically is not free; it can add travel time, which is time they could be spending working to earn money.

Without hypothecating, the emissions price allows the government to get revenue from higher emitters and lower income households (due to the cost being a greater percentage of disposable income), but I think misses out on a lot of potential reductions from every other household because those households are still largely oblivious to the opportunity costs of their decisions.

Surely it is more productive for New Zealanders to spend more time in commuting to work than forking out \$14-37 billion in international carbon credits.

A higher initial price also reduces the impact of future price changes as the percentage increase over a couple of years will only be around 10% vs. 40% of a low initial price. This could be better for afforestation as the potential return on investment of delaying is not as high.

Having a relatively stable price and reducing UBI, means businesses can act with more certainty in choosing the low emissions option, what remains uncertain is how much demand their business will receive. It also means they won't have to wait years for their investment to pay off.

A higher emissions price also encourages low-emissions businesses to launch their ideas in NZ due to the increased return, and this could create knowledge spillovers as well as reduced emissions and a business incubator for low-emissions innovations.

In setting an emissions price I support the NZPC's suggestion that it is best for the market price to be as close to the shadow price as possible. This reduces administrative costs for everyone as they do not have to factor in the changing running costs over time as the price increases. This is also better for lower income households that may not devote the time to this analysis. It seems easier to say the running costs are likely to be this each year so it would take x many years for the investment to be worth the higher initial price, than to calculate with this probability the price will be this in year one and that in year two and so on.

## **Support for an inclusive transition**

Another option for recycling revenue other than GST or a UBI is by reducing income tax. However, there are many people who will face higher costs from an emissions price who would not see as great a benefit from reduced income tax, e.g. stay at home mums/dads, children, students living on a student loan, unemployed people who don't fit WINZ's T&Cs, potentially entrepreneurs in the early stages of their business and possibly retirees not qualifying for a pension living in a reverse mortgage situation (i.e. by running down capital). For all these reasons, my preferred method is a UBI (with an age weighting due to children being less affected by higher costs than adults) as it provides the same benefit to everyone equivalent to a basic human right to emit an amount of GHGs. The UBI would be paid based on the emissions price and the allocated budget of emissions per person in that year. The net effect of this would be equivalent to paying people to reduce their emissions by say adding 10 minutes to their commute each day (cycling, PT, walking, etc.), and there will be less impact on people's disposable incomes so they can continue to make the same choices in the short term (due to allocated emissions per person being close to current average emissions per person) if that is worth more to them (aka least-cost mitigation).

A UBI would also reduce the poverty trap effect of the report's two favoured income assistance solutions (family & employment tax credits, and welfare benefits).

I disagree with the report's assertion that "Combining the two would ensure that both employed and unemployed households are covered", because the Social Security Act does not cover every unemployed person. Also, students living on a student loan would be

disproportionately affected because although their Consumer Price Index adjusted living costs (which may be a problem in itself for having an effective emissions price) would allow them to borrow more to cover the increased costs, their loan would be greater and sit with them for longer than previous generations. However I suppose you could say that as they do not qualify for the student allowance they are not a low income household.

At the end of page 228, "Much of this increase, however, was due to rises in the cost of items not directly affected by climate change mitigation policy, especially rents." However there is a chance that rents may be indirectly affected as people who don't mind the commute at the moment may decide that living closer to work is better for them (but then again maybe living closer to productive land is better).

## Forestry in the ETS

The effect of forestry and other removals on reducing ETS prices is a concern because it would be much better to reduce emissions than to offset them as the offsetting approach is limited by available land and more susceptible to reversal from natural disasters. It would probably be good for forestry to be subsidised in a separate scheme, where the price generally reflects that in the ETS.

If the ETS is a balloon constraining emissions, then including forestry would be like popping the balloon with a stick.

Removing forestry from the ETS may also reduce complexity of the scheme.

## Free allocation of NZUs

I disagree with the grandparenting suggested on page 86 of the report. To base the free allocation on a businesses level of emissions in recent years is bad in two ways:

1. It makes it harder for disruptive low-emissions businesses to enter the market as they are paying full price for any of their emissions whereas the existing business is paying zero, and if the existing business loses its share of the market to the other business, then it is free to increase its emissions or sell the NZUs to compete with the new business better.
2. It rewards businesses that have been slow to take action on their emissions, as the early adopters of low-emissions were never paid for it and receive a lower allocation of free NZUs.

I also do not support the approach of allocating a reducing percentage of free NZUs to industry each year. My understanding of it is that the industries export 90% of their product therefore they should only have to surrender NZUs to cover the 10% that goes to the domestic market. The full cost of the NZUs likely gets passed onto domestic consumers. However this leaves room for a competitor to enter the market and if they only export 10% of their product but still get 90% free NZUs then the cost they have to pass onto consumers is only 20% of the emissions cost. This would put pressure on the 90% exporter to reduce domestic prices as they need the domestic market to subsidise the

international market, but then they would have to increase prices overseas, which could negatively affect their competitiveness.

It would be better to not require NZUs for emissions attributable to exports and require NZUs for imports. However, agriculture may still be disproportionately affected by an emissions price because of the increased distance from population centres causing them to face higher transport costs of getting tradespeople to repair or build farm buildings. If farmers were allowed to attribute this to their operational emissions, then there could be issues because it would benefit both the farmer and tradesperson to inflate the emissions part of the bill as this gets offset. So it could be good to do an analysis to find the average cost per output an emissions price would impose on farmers (incl. things like buildings and maintenance) and if it is a significant amount then pay farmers this amount per export unit (minus the obvious emissions attributable to exports, which they would not have to surrender NZUs for). The average cost per output would probably need to be applied to imports as well. The analysis should allow the emissions price to only affect the domestic economy and would need to be done anyway if going down the free allocations route in order to determine the appropriate amount of free allocation. The analysis would need to be ongoing and look at the average emissions per output of both NZ and significant countries NZ trades with. Ultimately there may be a slight cost to exporters but it could be that the benefits of low emissions outweigh the cost of losing businesses that would be sustainable if other countries faced a higher emissions price.

All of this accounting, may make it sound like it would be easier to move the emissions price at the same pace as the rest of the world, but a decoupled policy has advantages, e.g. Trump-like events where a country abandons their efforts, and I vaguely remember reading some country intends to reduce their emissions through non-pricing mechanisms rather than introducing an emissions price. There is also the aspect of fairness and paying people what their efforts to reduce emissions are worth.

Recommendation 10.4 of the report basically says don't tax agriculture until other countries do or until there is a technological breakthrough such as a vaccine. However, there is already an advantage of taxing and that is consumer behaviour change.

Excluding exports and paying everyone a UBI should provide ample transition time for emissions-intensive industries. If they were to face a similar high emissions price in other countries, then that may be a reason to provide transitional support to allow time for a change in production. An advantage of letting consumers decide in the domestic market is that it gives more information as to which emissions-intensive products consumers still have a demand for and thus would be worth doing R&D on to lower the emissions.

Trade exposed businesses are not alone in having issues passing the cost on to consumers. The public sector may have to increase rates or taxes to cover the increased costs where activities are less adaptable, e.g. emergency services, construction costs. There may also need to be a provision to allow existing contracts to be updated due to the effect of an emissions price on operations.

## Other comments on the ETS

I do not see international trading as a concern for the ETS because I think trading should only go on between governments and not at the private sector level.

I recommend having an expiry date on the NZUs of say 1-3 years from the date the NZUs are auctioned to discourage speculation, which could otherwise reduce businesses' productivity. This might also make it easier to split the NZUs up into two prices for long-lived and short-lived gases later on, because existing units can be used for either but new units you have a choice of buying a specific type at the new reserve prices with an expiry of 1-3 years, or one of the old units that expires in 2 or 1 years time (so all the wildcard units expire at the same time).

## Electric vehicles

I would like to see a cost-benefit analysis comparing different types of EV (e.g. car vs. bike vs. motorbike) including the shadow price of the true social cost of carbon (recommended for public sector agencies by the NZPC) applied to overseas emissions before a finding or recommendation for price support of EVs is construed as subsidising electric cars. I think the analysis would find where two-wheeled EVs are an option, their benefits are greater than four-wheeled EVs, aside from taxis.

## R&D funding

I agree with the increase in R&D funding, but disagree with the particularly in agriculture part. Allocating more money to emissions-intensive sectors may make NZ more reliant on them rather than growing less emissions-intensive sectors.

In section 10.10 of the report, I think it is misleading to say the investment 'in agricultural emissions mitigation research is uncertain and small (at around \$16 million each year)' and then say things like 'in relation to the size of the agricultural sector ...' and 'the total size of Government's contribution of funding for innovation (in excess of \$1.5 billion)'. This is because the government funding for innovation includes AgResearch and PBRF among other potential sources, which may currently be researching agricultural emissions mitigation and if not could easily start given the importance that you have claimed in the report.

The funding should not be weighted towards the potential value of successful outcomes but also on the likelihood of success as otherwise recommendation 10.8 sort of equates to saying that I should gamble my money on lotto each week.

Even if vaccines are successful, there may still be ethical concerns regarding the animal's welfare from changing internal workings of its gut and possible side effects over a longer term than the studies conducted.

Any technology developed in NZ that is expected to be commercially successful taking into account the true social cost of carbon is likely to be low emissions. It is also one less thing that needs to be imported from countries whose energy generation is emissions-intensive,



and it is one more source of export income to make NZ less reliant on emissions-intensive industries.

Personally I don't see agricultural emissions as a major problem for NZ because I don't feel NZ is responsible for them as most of the product is exported (see appendix B).

## **The benefits of cycling, public transport and walking**

I think the benefits of mode shifting in the report are understated because the estimated emissions price trajectory used in the models is too low and so the estimates of increases in public and active transport are also conservative.

Electric bikes in cities may be of comparable speed to cars given speed limits (except perhaps in Auckland where distances and limits are greater) and/or don't require as much exertion as regular cycling. There are also less storage requirements allowing a slight increase in population density, and lower electricity requirements, resulting in lower demand and less cost of new infrastructure (and associated emissions). This could reduce the cumulative emissions from the electricity sector.

## **Urban form**

Regarding the urban form part of The Morgan Foundation's submission, I think loosening height and density restrictions would be most appropriate in the vicinity of planned public transport hubs.

Regarding transport emissions, if the inquiry's Terms of Reference limits the scope of the inquiry to not include international emissions and the report has not taken into account economic costs of purchasing electric vehicles, in particular costs to the gross tradeable deficit, then it is understandable that the report would not find a strong case to use urban planning policies to reduce emissions.

The report does point out that urban form changes slowly, "so any material benefits are likely to take decades to eventuate", though the government is talking about a sizeable number of houses needed each year.

## **Transition risks**

In the investment section, the report mentions a slow transition reduces transition risk to investments but it also reduces the chance of successfully mitigating. If the transition goes too slowly such that there is a small chance of success then you have to ask why bother trying to mitigate?

## **Carbon Capture and Storage**

It might be hard to recognise CCS as a removal activity because leaking CO<sub>2</sub> would be hard to see and test for compliance.

## **Aviation and shipping bunkers**

It is unclear whether international aviation and shipping bunkers are included in the Terms of Reference as either domestic emissions or costs of transition to a low-emissions

economy, but an obvious suggestion to reduce these emissions would be to adopt a 'buy local' approach.

At some point international aviation and shipping emissions will need to be addressed, and buying local may be the most cost-effective reduction strategy.

There is a risk that other countries will adopt a 'buy local' approach.

Historically NZ has not been a mass car manufacturer, nor as far as I know a source of raw materials for batteries. However, we do rely on exporting primary resources.

It is under this risk of a double knock to the gross tradeable deficit that the economic cost of relying on electric cars to reduce domestic emissions may become far greater.

I recommend making sure the gross tradeables deficit is sustainable and withstands the shocks of other countries adopting a 'buy local' approach.

## **General comments about the report**

It would be good to add to the impacts of climate change the displacement of climate change refugees requiring new infrastructure to be built on productive farmland that is increasingly affected by extreme weather events.

The second paragraph of F10.10 ("Yet, with adequate support for farmers ...") could be improved by expanding the examples of farmer support to include ", or not requiring emissions units for goods exported overseas".

There may be a decimal point mistake in the last paragraph on page 57 when referring to gross emissions of SD-25 and SD-0.

The criteria listed in the report on page 97 for a good emissions pricing scheme may place too much emphasis on "raise domestic emissions prices over time in line with NZ's progressively more ambitious international targets and objectives for domestic emissions reductions", given that my ETS model (appendix A) could have a relatively stable emissions price and yet contribute to significant emissions reductions. Also, the distribute fairly criteria should include future taxpayers (e.g. "... fairly and efficiently across ... the government, taxpayers, and future taxpayers").

## Answers to report questions

*Q6.1 Should the investment policy of the NZVIF be updated to identify low-emissions investments as a sector of interest?*

I assume the NZVIF takes into account future emissions prices, so smart investing would suggest that low emissions investments are already attractive to it as would any other technology they think will be successful in a low emissions world.

*Q10.1 Regarding point of obligation for agricultural emissions within the NZ ETS*

I like Option 1 (processor level) the most, primarily because of the reduced administration costs and it fits better with excluding exports. I have heard that OVERSEER did not have the best reputation in the past because its modelled results for some farms changed significantly between software updates. Distributing the modelling uncertainty across suppliers may be attractive. It would be fine to offer a certification scheme of say a checklist of doing this, this, and this, whereby the estimated emissions is lower. This could allow some farms to opt for low-emissions investment and target the domestic market, while others opt for export business as usual. A certification scheme may also make it easier to price imports.

*Q11.1 How could New Zealand signal a commitment to a widespread transition away from fossil-fuel vehicles? For example, should New Zealand explicitly aim to phase out the importing of fossil-fuel vehicles by some specified future date?*

New Zealand should signal a commitment by introducing minimum import standards for new and used vehicles and by a high initial emissions price.

No, it is too soon to set a specified date to phase out fossil fuel vehicles and there is an argument for the use of fossil fuel vehicles being reuse rather than the emissions involved in scrapping and producing a new product.

*Q11.2 What other policies are appropriate for incentivising the uptake of low-emission heavy vehicles?*

A high emissions price to start with rather than the slow increase suggested by the modelling. National Land Transport Fund not ringfenced to roading projects.

*Q13.1 Would giving Fonterra discretion to refuse milk supply where this would lead to inefficient land use and/or a significant increase in the company's GHG emissions provide any benefit? What, if any, conditions would need to be attached to the exercise of such discretion?*

This is a tricky one as I think refusing collection also denies ownership of a share in the company. Fonterra owns farms overseas and perhaps the most GHG efficient production may be to deny milk from NZ and use the local farms in the countries being exported to (due to transport emissions), in which case do NZ farmers still have any stake in the company?

## Conclusion

A decoupled emissions price and allocating a Universal Basic Income to everyone to cover the increased prices allows a higher, more accurate emissions price. A higher emissions price pays people fairly for the effort they put in to reduce emissions, locks in low-emissions investments such as better urban form, in the absence of a technological miracle would be the least cost way to reduce emissions, shares the burden more evenly between current and future generations, and allows stakeholders to benefit from their low emissions choices now rather than waiting years for it to pay off, which results in lower cumulative emissions. In the report it mentions that markets are working well when the market price is the same as the shadow price.

It is better to reduce emissions than to offset them.

A slower emissions price transition reduces transition risk to investments and gives people more time to adjust, but also reduces the chance of successfully mitigating climate change and does not fairly remunerate people for their efforts to reduce emissions. If the transition goes too slowly such that there is a small chance of success then you have to ask why bother trying to mitigate?

# Appendix A

## Proposed ETS model

1. Set an emissions budget incl. imported emissions and excl. exported emissions each year.
2. Divide the budgeted emissions by the weighted population of NZ to get the maximum emissions each person should be responsible for in a year. Babies would have less weight due to a lower emissions requirement, and the ETS should not promote having children as a form of income.
3. Multiply the emissions per person by the estimated emissions price and allocate this to each person and their children via IRD as a Universal Basic Income (UBI).
4. Industry has to surrender NZUs for emissions of products sold in NZ (including emissions produced overseas for imported goods). The NZUs could be sold at auction, but there is expected to be an expiry date on them of a year or two to stop NZU speculation.
5. The difference between emissions revenue and UBI spending, can be spent on emission reduction projects (such as insulation and forestry schemes), R&D funding (the spend would not need to be as high because of increased private sector investment due to competitive advantages resulting from a higher emissions price), alleviating the impact on agriculture exports (mentioned earlier in the free allocation of NZUs part of my submission), and possibly administration of the scheme.
6. The government after receiving advice from the climate commission and looking at their balance sheet can set the emissions reserve price, and the emissions per person for a year in advance. The government may also set an emissions cap for the auction 2 to 5 years in advance. If there is no emissions cap, businesses can buy and sell NZUs from the government for the reserve price at any time in the year (basically a carbon tax at tax time). I think the emissions price would be relatively stable with the preference being towards changing the emissions budget per person. Only requiring one years notice is important for the government because otherwise there would be a high financial risk to the government if it overestimated the emissions price and emissions per person, or it intended to sign up to a global carbon price that is higher than the domestic emissions price.
7. To reduce the cost of transferring a large sum of money from government to residents, or business to government each year, the surrendering of NZUs and allocation of UBI could be done on a quarterly basis.
8. Would probably set the emissions price for a year from now at \$30-40 a tonne with a one year expiry date to discover teething issues before the price goes to \$80 a tonne in two years time. Would have no cap on emissions at this stage as accounting for the price would be enough burden for businesses without having to figure out what to do in an auction situation, and it would also be good to see what reductions could be achieved just from the higher, more accurate price.
9. Forestry would not be included in the ETS. A separate scheme would need to cover it.

10. Regarding the backlog of NZUs, those NZUs would not be useable in the new scheme as there is no way units that could have cost as low as \$1 several years ago are now worth \$80. The government will have to go through a compensation process with each party, looking at how much they paid for the NZUs, what NZUs they surrendered for emissions, the level of risk believed to have been taken, the opportunity cost, and at the end of the process the government will have to make all of the information including compensation amounts public to encourage good faith in the agreements.
11. No international trading of units. If the government wants to increase the emissions cap or sell emissions it has to do this via a trade at the government level.
12. Allow businesses to do a one-off renegotiation of the cost part of contracts/quotes solely to incorporate the large jump in emissions price.

Relative to the modelling presented in the report, I think my ETS would result in higher cycling, public transport and better urban planning percentage increases initially and then go down as cars become more of an option again. There would also be higher initial EV uptake, lower cumulative emissions overall in reaching the target, and an increase in the likelihood of the disruptive decarbonisation scenario as disruptive technologies would receive more support from the private sector and households. Because of the increased support, NZ may be an attractive place to start up low-emission innovations, which supports both NZ and low-emission innovations. More land would be available in 2050 for future emission reductions.

The overall effect of an ETS and UBI on the government's balance sheet may be equivalent to a tax credit rather than a tax, which the government may or may not seek to reclaim in future by ordinary taxes or future emissions budgets, depending on how the economy is going as it may have improved due to the co-benefit of less oil imports.

## Appendix B

### Submission on New Zealand's priorities in international climate change negotiations

Wiremu Thomson, [www.climatedash.nz](http://www.climatedash.nz) (02/04/18)

As a creator of a website displaying countries' emissions profiles, my submission generally relates to transparency and fairness.

I made a submission to the Productivity Commission's low-emissions economy inquiry, in which I recommended that *a carbon tax or ETS should exclude exports and apply the carbon price to imports unless already taxed in another country, in which case the difference in carbon prices should be applied, so that a consistent price is used throughout a country's market.*

This partly comes from my belief that the reason the emissions exist is because someone wants to consume a product and not because someone is capable of producing a product. Therefore, the one responsible for the emissions is the person/country that uses the product.

In this context, the UN's current reporting framework does not provide enough information to fairly set targets and see who could be doing more. Countries report emissions produced in their country even though they may not be the ones to benefit from them. Almost 50% of NZ's emissions are from agriculture, but I think most of the agricultural products are exported overseas. China has high emissions from energy production, but they export a lot of manufactured goods to western countries.

Countries should have to allocate emissions produced in their countries to the countries that benefit from the production (exported emissions). Countries should also have to report emissions produced in other countries for their benefit (imported emissions).

Then perhaps the fairest way to decide emissions targets would be to take the amount of CO<sub>2</sub>eq that can be produced each year whilst remaining under the 1.5° target and divide it by the current world population to get the emissions each person can produce in a year. Use this as the base rate for each country, making minor adjustments for regional differences such as requiring more energy due to a colder climate (adjusting other countries rates as well so as not to increase overall emissions past the 1.5° target). Multiply the rate for each country by the country's population to get the maximum emissions the country can be responsible for in a year (i.e. produced emissions + imported emissions – exported emissions).

The point of using 'produced emissions + imported emissions – exported emissions' is to improve transparency and avoid having to factor in a country's emissions profile when setting reduction targets, and emissions profiles can change as time goes on. I think China and Turkey set their targets based on GDP, which makes it harder to understand what their emissions will be, but allows their targets to be more consistent if countries were to outsource emissions-intensive production to them or reduce their outsourcing.

The emissions targets could be more effective by the UN setting a carbon price (by say 75% of countries agreeing a price to apply in two years from the date of agreement). Countries that produce more emissions than their targets would have to pay the UN for the amount they went over, and countries that are under their targets would be paid by the UN in a similar way. If the UN had money left over due to countries not achieving their targets, then it could allocate the money in the best way to finance reducing emissions. I am not

sure what would happen if more countries were under their targets than over, possibly those countries would be owed money or levying countries to gather the funds to pay them.

Advantages of the UN setting a price:

- Countries might put more effort into reducing emissions and ensuring imported and exported emissions are allocated correctly.
- To integrate into economies where money is valued more than negative externalities.

Disadvantages:

- Countries would be more interested in falsifying emissions data.

Notes about the approach:

- International aviation and navigation emissions should be allocated to the country making use of the goods transported rather than where the ship fuels up. They should be taken into account at some stage as otherwise a ship from across the world could turn up at a port 5km away and appear as though the emissions involved in getting freight there are less than something grown 50km away. If the UN sets a carbon price, then international shipping or logistics companies could probably figure out how emissions should be allocated. Without a price, a formula should be used as otherwise the emissions may be allocated to the country on the journey that cares the least about being allocated the emissions. At a glance it would be to do with the tonnes of freight destined for a particular country as a percentage of total freight, multiplied by the emissions to each port in the journey.
- The population used for a country should be today's population not the population in that year. Otherwise people in a country might adopt a short-term solution of baby booming (as babies would count towards population, but would likely not use the emissions per capita allocated for them), at long-term cost to their country and others once grown into adults. Countries may want to make migration arrangements with other countries as to how the allocated population numbers would change as a result of migration, but refugees would definitely transfer the emissions per capita from the country they are leaving to the country they are now living in. The arrangements should be signed off by the UN to ensure countries are not being taken advantage of (e.g. effectively losing their emissions per capita via migration for immediate cash in hand, which may lead to disputes later on).
- If a country doesn't pay for exceeding its targets, then the UN could apply economic sanctions if it feels they would help. If the country is a big importer, then countries exporting to it might take on the liability to pay for emissions exported to the country. If the country is a big exporter, then trade tariffs on goods imported from that country might be the way to go.
- It might be good to include a buffer in the amount of CO<sub>2</sub>eq that is allocated to countries each year as some struggle to make deadlines unless aiming for say 10 minutes early.

Other points:

- Improve the reporting frequency and format (e.g. use MS Excel) of large emitters even if they are not Annex I countries, as it makes it easier to automate analysis of their emissions.