The cost of inaction on climate change

Discussion Paper by Jake Roos, with input from Dave Grimmond.

Introduction

- There is presently no legal compulsion on councils and other organisations to reduce their emissions or achieve carbon neutrality. Action to reduce to emissions may increase costs in some cases and offsetting emissions definitely will. So some might say why act now?
- Climate change is a collective action problem – all must act together or the problem cannot be solved, but the consequences of failure are not distributed based on who emitted most, or who did or did not act.
- As we know the window of opportunity to avoid the worst consequences of climate change is closing. This creates a very strong rationale for voluntary action, rather than waiting for stronger legislation to be enacted that forces action.
- While individuals taking action to reduce emissions does not guarantee success of limiting global heating to a manageable level, inaction definitely increases the chances of failure. That is to say, the link between someone's action to reduce emissions and the level of climate change impacts they and the world will experience is indirect.
- However, lack of action in the short term is likely to lead to more extreme policies to cut emissions in the future. If organisations do not reduce their exposure, they may find themselves paying a high carbon emissions cost to use carbon-dependent infrastructure in the future ('lock-in'). In an extreme but plausible situation, outright bans on fossil-fuelled equipment could lead to these kinds of assets needing to be written off ('stranded'). Although speculative, for this type of 'climate change impact' a more direct link between actions and consequences can be drawn.
- Bearing this in mind, various examples and studies of the 'possible costs of inaction' will be explored.

Costs of climate impacts

- A report prepared by NIWA for the Parliamentary Commissioner for the Environment identified there are 9,205 land parcels in the Wellington Region that would be directly impact by a 3 metre (m) sea level rise, with an associated population of 12,358 people[1]. An assessment carried out by GWRC GIS staff of 1 m sea level rise in the Petone/Seaview area identified risk 2,646 land parcels with a rateable value of $NZ2.5 billion (bn). Applying this average valuation to the total from the NIWA report implies a capitalised value of $NZ8.6bn impacted by a 3m sea level rise. This estimate does not include the threat identified by the NIWA report to 291km of roads, 24km of railway, 5.2km of wharfs and jetties, and one airport. It also does not account for the impacts that sea level rise might have on

[1] R.G. Bell, R. Paulik, and S. Wadwha, 'National and Regional Risk Exposure in Low-Lying Coastal Areas: Areal Extent, Population, Buildings and Infrastructure', Prepared for the Parliamentary Commissioner for the Environment (National Institute of Water & Atmospheric Research Ltd, October 2015), https://www.pce.parliament.nz/media/1384/national-and-regional-risk-exposure-in-low-lying-coastal-areas-niwa-2015.pdf

communities that will be impacted by disruption to access routes. For example, locations like Eastbourne and Miramar may not face significant risks of inundation but could still be impacted by damage to access ways.

- Tonkin and Taylor produced a report for LGNZ estimating the value of local government assets at threat from sea level rise and found approximately $NZ0.5bn within 1m of the high tide mark in the Wellington Region, $NZ0.9bn within 1.50m and $NZ1.8bn within 3m.[2]
- Tonkin and Taylor did a similar report for Wellington City Council. For a 1.5m sea level rise it estimated $NZ6.5bn of assets would be affected across the city, displacing around 2,000 residents.[3]
- Sea level rise as high as this is now inevitable, but rate of change may be slowed by reducing global emissions, buying time to adapt. Furthermore, more rapid multi-metre rises due to ice sheets collapsing in the Antarctic and Greenland is made more likely by rising temperatures.
- A paper on the Global Social Cost of Carbon (the damage caused globally by the emission of one tonne of CO_2e of greenhouse gases) found that this price was an average of $US417/tonne (approximately $NZ600/tonne), spread around the world[4]. Some regions are more vulnerable to climate impacts than others, and so these costs are not evenly distributed. However, due to the many and complex connections between countries (trade in particular) climate change impacts in one part of the world will have consequences elsewhere.
- A price of $NZ600/tonne exceeds the cost of most abatement measures, some of which have a negative cost. The Productivity Commission estimated that carbon prices in NZ would need to rise to between $70-$200/tonne to put the country on track to achieving net-zero emissions in 2050.[5]
- Other studies have estimated the costs of inaction on a global scale and compared them to the cost of carbon abatement. The most well-know of these is the 2006 Stern Review of the Economics of Climate Change. It found that without action, the overall costs of climate change will be equivalent to losing at least 5% of global gross domestic product (GDP) each year, now and forever. Including a wider range of risks and impacts could increase this to 20% of GDP or more, also indefinitely. Conversely, the reviewers estimated the cost of stabilising the concentration of greenhouse gases between 500 and 550 parts per million of CO_2e (almost twice the preindustrial average) would cost 2% of global GDP.[6]
- In 2015 the Economist Intelligence Unit estimated the costs of inaction on climate change, using the same discount rates as the Stern Review, that with 6°C of global warming (possible by 2100 under an unabated emissions scenario) 30% of the total current stock of manageable assets would be lost, which have a present value of US$43 trillion.[7]

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[2] https://www.lgnz.co.nz/our-work/publications/vulnerable-the-quantum-of-local-government-infrastructure-exposed-to-sea-level-rise

[3] Tonkin and Taylor. Sea Level Rise Options: A report prepared for Wellington City Council June 2013. https://wellington.govt.nz/~/media/services/environment-and-waste/environment/files/61579-wcc-sea-level-rise-options.pdf

[4] Katharine Ricke, Laurent Drouet, Ken Caldeira and Massimo Tavoni. (2016) Country-level social cost of carbon. Nature Climate Change | VOL 8 | OCTOBER 2018 | 895–900

[5] https://www.productivity.govt.nz/inquiry-content/3254?stage=4

[6] The Economics of Climate Change: The Stern Review: https://www.webcitation.org/5nCeyEYJr?url=http://www.hm-treasury.gov.uk/sternreview_index.htm

[7] The Economist Intelligence Unit Ltd (2015) The Cost of Inaction: Recognising the Value at Risk From Climate Change https://eiuperspectives.economist.com/sites/default/files/The%20cost%20of%20inaction_0.pdf

Cost of carbon emissions

- It is a simple matter to multiply GWRC's 'carbon footprint' by a possible future carbon price to gain an understanding of possible future costs for the organisation, bearing in mind that we do not know how the organisation's emissions footprint will change, or if or when any given level of carbon price will be attained. The scenarios in Attachment 1 show some possible outcomes. The 'carbon offset costs' represent the costs that would need to be paid (either directly but more likely indirectly) under a mandatory compliance scheme.
- Regarding stranded fossil-fuel assets, this is even harder to predict. Some countries have announced future dates after which the sale of fossil fuel vehicles will be banned. Some have plans to exclude fossil-fuelled vehicles from certain metropolitan areas. None have implemented or signalled blanket bans on existing assets.
- While a total valuation by category has not been carried out, GWRC and its affiliates have a large set of fossil-fuelled assets in the form of buses, port equipment and trains. However, GWRC is not completely exposed: electrically-powered assets including the majority of trains, water supply and treatment services and buildings are unlikely to ever be stranded.

Conclusion

Repeated studies have found the costs of taking action on climate change are far less than the costs of inaction at a global aggregate level. Further early action reduces the cost of action, as it reduces the risk of lock-in and stranded assets.

Conventional economic analysis also fails to consider or reflect the risk of widespread systems collapse, which becomes more likely as damage to human societies and natural systems increases. In such a situation the cost of inaction is effectively unlimited.