

Essay

The Economic Effects of Climate Change: Positioning New Zealand to respond

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Essays

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1. INTRODUCTION

There are several powerful global trends that look likely to shape the environment in which New Zealand operates over the next several decades, ranging from the economic rise of Asia to new communications technologies and climate change. These developments will generate both significant opportunities as well as significant risks. New Zealand's economic future will be strongly influenced by the choices it makes in positioning itself in this changing global environment. The challenge for New Zealand is to manage the risks and to invest behind the opportunities.

The focus of this essay is on climate change, which represents a significant long-term economic exposure for New Zealand over the coming decades. Although New Zealand can do little to influence global climate change because of its small size, both the New Zealand government and New Zealand firms will need to determine how they want to position themselves to respond.

Sometimes the New Zealand response is to assume that because it cannot exert significant influence over global trends, on account of its small size, that New Zealand should not deliberately engage and should simply respond to the world as it finds it. However, despite New Zealand's small size, it still has meaningful choices to make. New Zealand can and should act to position itself in a proactive and strategic manner. Indeed, it may be that smaller countries can position themselves more effectively than larger countries to the extent that they act more flexibly and responsively.

Climate change has become a high-profile issue in New Zealand over the past year or so with a range of political parties making various commitments to reduce New Zealand's emissions – often in a fairly significant manner. New Zealand firms are also making decisions about how they ought to respond to changing market conditions that are driven by climate change.

The major argument made in this essay is that before New Zealand commits itself to a particular course of action in response to climate change, it is necessary to understand the costs and benefits of various strategic approaches to respond to climate change. In particular, there is a need to guard against the risk that the proposed solutions will cause more damage than the problem that they are designed to address.

The essay begins by describing the importance of New Zealand making a deliberate, strategic choice as to how best to position itself in response to climate change. The essay then focuses on the economic challenges and opportunities that climate change will generate for New Zealand. The strategic choices available to New Zealand are described, the type and nature of New Zealand's economic exposures to climate change are outlined, and a range of possible actions are proposed.

2. ECONOMIC CHALLENGES AND OPPORTUNITIES

Although New Zealand's economic performance over the past 15 years or so has been substantially better than in previous decades, a substantial challenge remains. New Zealand is currently ranked 22nd out of 30 OECD countries in terms of real per capita income and there is a 30% income gap between Australia and New Zealand. Income gaps of this magnitude make it difficult to offer the standard of living enjoyed in other countries, including the quality of health, education, and infrastructure services, and also create an incentive for people, companies, and capital to exit for other countries. Going forward, there is a need to raise productivity growth in a substantial and sustained manner, and this will require a step change in performance.

There are some obvious priorities around savings, investing in research and knowledge, increasing New Zealand's international economic engagement, as well as issues around infrastructure, tax, education, and so on. Although progress is being made in some of these areas, notably savings, a much more determined effort is required if New Zealand is to attain the income levels of most other developed countries.

This effort needs to be much more than a 'chasing the OECD median' exercise in which the aim is to have policy settings and outcomes that simply approximate other developed countries. New Zealand needs to develop a clear strategy as to how it will compete in the global economy and how it will seek to position itself in the global environment so as to manage the risks and seize the opportunities associated with significant global developments. Consider the following global trends, which are likely to have a significant influence on New Zealand's economic future.

- The economic return of Asia

One of the most impressive economic stories of the past few decades has been the economic rise of Asia. This process started with rapid growth in countries such as Japan, Taiwan and Singapore, and has continued more recently with the economic emergence of China and India and the broadly-shared growth in many other Asian countries such as Vietnam. The global economic centre of gravity is shifting quickly towards Asia.

This represents a significant opportunity for New Zealand, as large consumer markets emerge relatively close to New Zealand. For the first time in its history, New Zealand is in roughly the right part of the globe with respect to global economic activity. On the other hand, the economic rise of Asia generates significant competitive challenges for New Zealand firms.

- Globalisation

New Zealand has benefited from the substantial growth in international trade and investment flows, and from successive rounds of trade liberalisation. As a small economy, New Zealand's economic prospects rest heavily on its ability to engage with the global economy, and the enhanced ability to access foreign markets matters significantly.

However, with the advantages of globalisation also come a more intensely competitive global environment. New Zealand is very exposed to the forces of international factor mobility and agglomeration, because of its relatively small scale and physical remoteness. For example, the OECD estimates that 24% of New Zealand's skilled population live overseas – the highest proportion in the OECD.

- Technology

Developments in communications technology allow for New Zealand to overcome the tyranny of distance, by accessing global markets as readily as firms located in other countries. There are over 1 billion people connected to the internet, a number that is growing very rapidly. In principle, this enables New Zealand firms to access global markets in the same way and on the same terms as their competitors who are physically located closer to large international markets. Some argue that this will kill the tyranny of distance. However, New Zealand is not the only country that stands

to benefit from technological progress and firms in many other countries are using it to develop a competitive advantage.

Together, these developments offer substantial opportunities for New Zealand. Indeed, some of these developments appear custom-made to benefit New Zealand. But positive potential does not automatically translate into real benefits. New Zealand's engagement with Asia is lagging, it has not been an active participant in the globalisation process, and New Zealand's communications infrastructure is not close to world leading.

There is a need for a clear strategy as to how New Zealand is going to take advantage of these changes, as well as manage the downside risk. This need to respond strategically is particularly the case with respect to another significant global development: climate change. Climate change has the potential to be one of the most important strategic issues facing the New Zealand economy over the coming decades, and accordingly it is important that we think hard about it.

Climate change, and the world's response to it, looks likely to have significant global economic effects over the next few decades. Climate change is likely to have a significant impact on New Zealand's ability to compete in the global economy, advantaging some areas and potentially disadvantaging other areas of the New Zealand economy. For example, New Zealand's existing emphasis on shipping heavy, reasonably low value goods, long distances to markets may become increasingly unsustainable.

If New Zealand does not position itself thoughtfully, it runs an increased risk of having its competitive position significantly eroded. It is in this strategic context that New Zealand needs to be thinking about responding to climate change.

3. CLIMATE CHANGE

The level of public, corporate, and governmental attention on climate change has increased substantially over the past year or so with high profile commentary on the science and economics of climate change, ranging from the UN's Intergovernmental Panel on Climate Change (IPCC) reports, to the Stern Report in the UK, and the Al Gore movie. Climate change has gone from being a reasonably fringe issue several years ago to being central to the public debate in most developed countries.

A consensus has emerged that global climate change is underway and that human activity, in the form of greenhouse gas emissions, is contributing to this process. For the most part this debate is over, although scientists still have a way to go to fully comprehend what is an incredibly complex process. In response, there are widespread attempts underway by governments and firms to respond and to efficiently mitigate emissions of greenhouse gases and adapt to this changing world.

So how should New Zealand position itself in response to climate change? New Zealand has ratified the Kyoto Protocol, in which countries have committed to various emissions targets for the 2008-2012 period. The New Zealand government is currently deciding on the form of a regime to introduce to control emissions in order to attempt to meet its commitment of holding greenhouse gas emissions at their 1990 levels.

Indeed, much of the climate change debate in New Zealand is focused on ways in which to effectively mitigate New Zealand's greenhouse gas emissions, through such measures as an emissions trading regime, energy efficiency, introducing bio-fuels and so on. And beyond the existing Kyoto commitments, politicians are talking about longer-term targets. At the start of this year, the Prime Minister stated that "I believe we can aspire to be carbon neutral in our economy and way of life". More recently, the National Party has committed to a legislative target of reducing emissions by 50% (relative to 1990 levels) by 2050.

However, in order to know whether such commitments are in New Zealand's interest, there is a need to undertake some hard-headed analysis. The following discussion describes several strategic options that New Zealand could choose in order to respond to climate change, outlines the key exposures that the New Zealand economy faces to climate change, and then discusses how New Zealand should think about acting given the significant uncertainty about the nature of these exposures. A range of possible government and firm actions are then discussed.

Strategic options

So how should New Zealand respond to climate change in a way that will promote New Zealand's interests? There are a range of possible strategic approaches that could be chosen. These include, by way of example:

- Global leader

In this approach, New Zealand would carve out a globally distinctive position and seek to become a world leader by committing to very ambitious targets for emissions reductions. A key argument made in support of this approach is that there are big opportunities to be gained, and big downside exposures that can be avoided, by developing a national brand in which New Zealand is seen as making a leading contribution to reducing climate change. The idea is to extend New Zealand's existing clean, green national brand to respond to climate change concerns.

In addition, an argument can also be made that getting New Zealand firms accustomed to operating in a carbon-constrained domestic market will generate significant benefit in reducing subsequent adjustment costs – and perhaps by generating some 'first-mover advantage'.

The government's stated aspiration for carbon neutrality, if it were converted into a specific numerical target with binding deadlines, would be an example of such a strategic response.

- Move with the pack

In this approach, New Zealand keeps pace with other developed countries, but avoids being seen as either a laggard or a leader by participating in international agreements and making commitments to reducing greenhouse gas emissions that are approximately in line with most other developed countries.

This approach assumes that New Zealand needs to respond (and to be seen to be responding) to climate change, but that investing in building a distinctive position is too costly or too risky given the expected benefits. New Zealand chooses to act to avoid the risk of negative brand value that may be associated with inaction, as well as to assist New Zealand firms to adjust to this new environment, but sees little economic upside from moving out ahead of other developed countries.

Given the types of commitments that are being made by other governments, even aiming to move with the pack is likely to require significant commitments being made. For example, the National Party's recently announced commitment to a legislative target of a 50% reduction in greenhouse gas emissions by 2050 looks fairly mainstream given the commitments made by a number of European countries, including the UK, as well as Japan (and the Australian Labor Party's target).

- Do as little as possible

In this approach, New Zealand does nothing further beyond that which it has already committed to. This strategy assumes that the upside from being a world leader in terms of emissions reductions are small, and that the costs to the New Zealand economy are large given New Zealand's high level of emissions intensity. The argument is that any response that constrains New Zealand's emissions is likely to impose a competitive disadvantage on the New Zealand economy, and encourage firms to exit New Zealand for other locations.

There may also be other strategic options available, but this gives a flavour of the type of strategic choices open to both the New Zealand government and New Zealand firms. It is not immediately clear which of these strategic options will do the most to strengthen the competitive position of the New Zealand economy. Each of these approaches rests on a different view of the costs and benefits of responding to the economic effects of climate change.

Before major decisions are made, it is important to understand the full range of economic effects that climate change may have on New Zealand. History records many examples of companies and governments misreading changing market conditions and making significant investments that turn out not to be warranted. For example, cable laying in the dot-com period, the 3G spectrum auctions in Europe where companies spent substantial sums of money, as well as some of the Think Big projects in New Zealand. Conversely, if markets do move, and no investments have been made in advance, the country or company may suffer a significant loss.

Different countries will likely choose to respond to climate change in different ways, as they will face different costs and benefits. Some countries can reduce their emissions more readily than others (e.g. by adopting nuclear power), others may expect to benefit from their firms developing new technologies in response to the introduction of demanding emissions targets, and so on. New Zealand will need to work out what its cost and benefit profile looks like given the nature of its economy. Simply following what other countries have done may not be appropriate given the distinctive characteristics of the New Zealand economy.

There is a need to assess both the costs of taking various actions to reduce emissions and also what economic upside can be expected from various courses of action. Commitments that will significantly alter the functioning of the New Zealand economy should not be entered into without first undertaking an analysis of the implications.

In particular, there are a series of questions that should be answered, such as: What does a carbon-friendly national brand buy in terms of economic upside, and what sort of investment does it make sense to make to build such a brand? Are New Zealand firms better placed to compete globally if demanding emissions standards are adopted in the New Zealand market? What are the costs imposed on the New Zealand economy if New Zealand moves to constrain emissions more aggressively than the countries it is competing with? At the moment, however, there seems to have been little analysis of these types of questions by government decision-makers.

The following sections attempt to provide some insight into these issues. The discussion begins by describing the nature of New Zealand's economic exposures to climate change to provide the basis for understanding the costs and benefits associated with various courses of action. The essay then considers how decision-making should be approached given the presence of significant uncertainty around the extent of these economic exposures, and then suggests a range of possible actions to position New Zealand to respond to climate change.

New Zealand's economic exposure to climate change

In terms of New Zealand's economic exposure to climate change, it is useful to draw a clear distinction between the direct and indirect effects of climate change. The direct effects relate to the economic impact of the actual changes in climate, such as temperature and rainfall changes. The indirect effects relate to the actions of consumers, companies, and governments in response to climate change.¹

¹ This discussion of the direct and indirect economic effects of climate change should be read in conjunction with a narrated powerpoint presentation on these issues, available on the New Zealand Institute's website at www.nzinstitute.org

Direct effects of climate change

The IPCC reports represent the most authoritative consensus statement to date of the likely direct effects of climate change.² These reports project increases in temperatures of between 1.8 and 4.0 degrees Celsius before the end of the century, under a range of possible scenarios. This projected temperature increase is due to significant increases in the level of carbon dioxide, and other greenhouse gases, in the atmosphere – which is due in large measure to human activity.

Climate change will also manifest in terms of changed rainfall patterns, rising sea levels, and an increased incidence of extreme weather events such as cyclones and storms.

However, changes in global averages can conceal significant regional variation. Both temperature and rainfall changes will vary significantly across the globe – the polar regions, for example, are likely to warm up more significantly than other parts of the world, rainfall increases are more likely in equatorial regions, and Africa is likely to be hard hit by reduced rainfall and increased temperatures. This regional variation goes some way to explaining why attitudes towards addressing climate change vary across countries.

Indeed, some countries, such as the Scandinavian countries, Russia, and Canada, stand to benefit from climate change as agriculture and tourism are assisted and as these countries are better able to access natural resources such as oil and gas. Columbia University have produced an index that assesses countries on their exposure to climate change, including their ability to respond, and finds significant national differences. The Scandinavian countries, for example, do well on this ranking, as do many other developed countries, whereas poorer countries in Africa and Asia do less well. New Zealand ranks 16th out of 100 countries on this index.

Some initial work was published a few years ago to assess New Zealand's exposure to the projected global changes in temperature and rainfall, on the basis of the 2001 IPCC reports. More work is planned using the latest IPCC research to update these projections, although the overall picture is unlikely to change significantly. The basic picture is of warming temperatures across New Zealand over the next several decades through to 2100, with some increased regional variation in rainfall across New Zealand over this period.

The mid-range scenario is for temperature increases of 1.5-2.0 degrees Celsius for much of New Zealand, with southern regions expecting a slightly lower temperature increase. Rainfall is projected to increase in many regions, particularly in the west of the country. However, some areas, such as the Hawkes Bay, can expect reduced rainfall.

These projected climate changes seem unlikely to have a substantial negative effect on the New Zealand economy. There are some types of primary sector economic activity that may need to adjust, and there may well be some changes in land use as some activities become less attractive and as some new types of activity become more attractive in particular areas. However, adaptation in terms of land use and agricultural practice seems possible without substantial disruption. And for some parts of the country, particularly the south, the higher temperatures – particularly in the winter – will boost primary sector productivity.

So the overall sense is that the direct effects of climate change in New Zealand are reasonably benign. Although there are likely to be costs due to an increased incidence of extreme weather events, such as coastal flooding and erosion in areas like Northland, these seem unlikely to have a substantial long-term impact on the productive base of the New Zealand economy.

New Zealand may also obtain a benefit in terms of being a more preferred global location choice. If other parts of the developed world become less attractive for people, New Zealand may be better placed to attract talented migrants and firms due to its relatively favourable climate

² The IPCC reports are available at www.ipcc.ch

outcomes. New Zealand's relatively remote location also means that it is unlikely to be a major destination for environmental refugees (except perhaps from some of the Pacific Islands).

Compared to other countries with which New Zealand's primary sector competes, New Zealand looks to have a relative advantage. Australia, in particular, looks to be exposed to potentially significant water shortages that will have a negative impact on its agricultural sector. So, if anything, the direct effects of climate change may strengthen New Zealand's competitive position. Against these relatively positive effects is the potential for the direct effects of climate change to disrupt New Zealand's physical supply chains and make it more difficult for New Zealand to physically transport its goods and services to market.

In sum, the direct effects of climate change on New Zealand look to be relatively benign over the next several decades. However, if temperatures increase beyond these projected levels, there would be an increased likelihood of negative effects on the New Zealand economy as the agricultural sector would come under significantly increased pressure. So there is a need to remain aware of the direct effects, and it is New Zealand's interest for the world to combat climate change by mitigating emissions and investing in new technologies. In addition, the remaining scientific uncertainty means that there is a possibility that the effects may differ from those projected and so this should be an area of ongoing monitoring. Complacency is not warranted.

Indirect effects of climate change

The indirect economic effects of climate change are, however, much more likely to have a significant impact on the New Zealand economy over the next several decades. The indirect effects of climate change are the result of individuals, companies, and governments changing their behaviours in response to concerns about climate change. For example, changes in consumer preferences that reflect increased concern about climate change, the actions of government in restraining greenhouse gas emissions, and the development of new technologies and business models that are more emissions efficient.

New Zealand's exposure to these indirect effects of climate change may be significant even if its exposure to the direct effects of climate change turns out to be small. The existence of these indirect effects means that climate change cannot be dismissed simply because of concerns about the IPCC process or doubts about aspects of the science. New Zealand's response is to the economics of climate change rather than simply to the science of climate change. Of course, the direct and indirect effects are likely to be mutually reinforcing; the more significant the direct effects are, the more substantial the indirect effects are likely to be as well.

It is also important to note that although the remaining scientific uncertainty around the extent of climate change is likely to take decades to resolve, many individuals, companies, and governments are forming judgements now on climate change and altering their behaviour accordingly. Although these actions will be related to the scientific debate and observed climatic outcomes, they may also de-couple over significant periods of time. For example, there may be 'attribution bias' in which events such as droughts or unusually hot summers are attributed to climate change and have an impact on behaviours even if it turns out that such attribution is spurious. Perception can be reality.

Another significant difference between New Zealand's exposure to the direct and indirect effects of climate change is that whereas the direct effects of climate change are mainly New Zealand specific, the indirect effects are global in nature. That is, New Zealand's exposure is to changes in behaviour in global markets by firms, governments, individuals. New Zealand's climate change response is not simply a response to the changes in climate and preferences that occur within New Zealand.

The following discussion considers three important types of indirect effects of climate change, and how these might impact on the New Zealand economy.

- Changing preferences

Numerous surveys and reports indicate that consumer preferences are beginning to change, with greater reported concern among consumers about the climate change impact of their purchasing decisions. There seems to be an emerging consumer desire to buy goods and services that do not make a significant contribution to worsening climate change. Although it is easy to dismiss the food miles campaign as another form of protectionism, some of this also reflects genuine changes in consumer preferences with regard to climate change.

Companies are beginning to change the way in which they act, at least partly in response to a view that consumers are increasingly concerned about climate change. Indeed, company actions are likely to be a significant driver of changing consumer behaviour – companies can decide what to stock and so influence buying decisions. For example, UK supermarket chains such as Tesco and Sainsbury's are changing their purchasing decisions and committing to stocking product that have a low carbon footprint. There are already examples of New Zealand firms being told to demonstrate their carbon credentials or face losing contracts with major international retailers.

Significant parts of the New Zealand economy have some potential exposure to these changing consumer preferences and company behaviour. On a rough calculation, about 60% of New Zealand's export base is comprised of goods and services that have a first-order exposure to changing consumer preferences, such as the food and beverage and tourism sectors.

To give an example of the scale of the exposure, New Zealand firms currently export around \$1 billion of food and beverages into the UK with a significant amount being sold through supermarkets that are beginning to examine their supply chains more closely. In addition, New Zealand's international tourism industry is reliant on people flying relatively long distances to New Zealand. To the extent that consumers change their preferences towards local tourism, this creates a further significant economic risk.

Conversely, New Zealand has a relatively small presence in the types of services such as commercial services like banking, insurance, call centres, and the like, which have a lower exposure to these changes in consumer preferences.

Global consumers are not a homogenous block, and there will likely be significant variation in the extent of preference change among different groups of consumers. However, the consumers that are most likely to be the target group for New Zealand firms – relatively high income, environmentally aware, and so on – are the group that are most likely to alter their purchasing decisions on the basis of concerns about climate change.

Of course, New Zealand's exposure is not all negative. New Zealand firms may be able to develop brands that build on New Zealand's existing clean, green national branding. This branding may become much more valuable if consumers become more environmentally aware.

- Government action to reduce emissions

Governments around the world are already acting to constrain and price the emissions of greenhouse gases. In addition to their existing Kyoto obligations, many governments are making longer term commitments to reducing greenhouse gas emissions. Indeed, the New Zealand government is currently developing its policy approach and various political parties are signalling commitments to reduce emissions. Meeting New Zealand's existing Kyoto commitments, let alone meeting more significant emissions reductions targets, will require significant change in the New Zealand economy.

New Zealand has a particular exposure to the pricing of greenhouse gas emissions because of the high emissions intensity of the New Zealand economy. Although New Zealand accounts for just 0.14% of global carbon dioxide emissions, New Zealand has the 5th highest overall emissions per capita in the OECD and the 4th highest emissions per unit of GDP (at over 50% above the OECD average level).

This high level of emissions intensity exists despite a relatively high contribution to energy supply from renewable sources: about 29% of New Zealand's energy supply currently comes from hydro, geothermal, wind, and so on, compared to an OECD average of 6%. And New Zealand's emissions are continuing to grow. Although New Zealand committed to holding its greenhouse gas emissions at 1990 levels under the Kyoto Protocol, New Zealand's emissions are currently over 25% higher than in 1990. This has generated a financial liability that is currently estimated at over \$550 million.

New Zealand's high level of emissions intensity is due in large measure to the distinctive composition of New Zealand's greenhouse gas emissions. Less than half of New Zealand's total emissions come from carbon dioxide, compared to a global average of 70%. Methane emissions, largely from the agriculture sector, account for 34% of New Zealand's emissions, which is a significantly higher share than most other developed countries.

This high level of emissions intensity suggests that the potential for pricing of greenhouse gas emissions creates a significant economic exposure for economic activity undertaken in New Zealand. Similarly it suggests that bold aspirations for reducing New Zealand's emissions may involve a more significant cost for New Zealand than for other countries (particularly as there is little indication of a technological solution to mitigate methane emissions).

- **New technologies and business models**

Climate change is likely to bring opportunities for firms as well as costs. To the extent that emissions are priced and consumer preferences change, financial incentives are created for firms to develop new business models that are less carbon intensive, to invest in renewable energy, and develop new brands. Indeed, there has already been a rapid increase in investments in renewable energy and firms are investing in developing new ways of doing businesses that are less emissions intensive.

These developments in global markets provide opportunity for New Zealand companies if they can develop new technologies and business models for which there are markets. Finding ways to enhance the efficiency of the production process or supply chains or shifting production closer to consumers provide competitive opportunities for New Zealand firms. Conversely, significant risks exist if New Zealand firms slip behind their international competitors.

Summary

The above analysis indicates that New Zealand's major economic exposure is to the indirect effects of climate change. The various indirect effects of climate change have the potential to have a substantial economic impact on New Zealand over the next few decades, and the response of the New Zealand government and New Zealand firms to these indirect effects will have a significant impact on the competitive strength of the New Zealand economy. By comparison, the direct economic effects of climate change on New Zealand seem relatively benign.

Accordingly, New Zealand's policy response should primarily be focused on positioning New Zealand to respond to these indirect effects. Indeed, it is difficult to justify ambitious action by the New Zealand government in terms of post-Kyoto commitments to reduce greenhouse gas emissions on the basis of a concern about the direct effects of climate change. Positioning New Zealand to respond to the indirect effects may provide a more powerful case for making such commitments to reducing emissions, but the argument needs to be made explicitly.

In any case, of course, there is little that the New Zealand government can do to contribute to reducing global emissions given its very small scale. Recent media headlines drawing a link between IPCC projections of coastal flooding in Northland and the Coromandel, and the nature of the government's response in terms of constraining emissions, do not reflect the New Zealand government's inability to influence these climate change outcomes.

Government action should be assessed primarily in terms of its ability to position New Zealand to respond to the indirect economic effects of climate change, not simply in terms of reducing emissions. Of course, New Zealand has some existing obligations under the Kyoto Protocol, and it is obviously appropriate that New Zealand seek to find ways to satisfy these commitments. But New Zealand's climate change policy ought to be a much broader endeavour.

Climate change should be approached in the same way as the other long term economic issues described above, such as the rise of Asia and the development of new technologies. In particular, New Zealand should act in such a way as to strengthen its competitive position so that firms, which are increasingly internationally mobile, choose to locate and grow from a New Zealand base because New Zealand provides a globally competitive platform for firm activity.

There are other considerations that are sometimes identified as relevant in shaping New Zealand's policy response to climate change: a concern for global environmental outcomes, moral concerns about stewardship of the planet, being a good global citizen, and so on. But the reality is that there is very little that New Zealand can do to contribute to resolving the global climate change problem because New Zealand emits just 0.14% of global carbon dioxide emissions. Reasonable arguments can be made for the other objectives influencing government policy, as well as individual action, but this is not the perspective adopted in this essay.

Decision-making under uncertainty

The challenge for New Zealand is to respond appropriately to these indirect economic effects of climate change. One of the difficulties in doing so is that the indirect effects described above pull in different directions. For example, changing consumer preferences would tend to move New Zealand towards developing a climate change-friendly national brand by setting ambitious targets for emissions reductions, whereas the relatively high level of emissions intensity of the New Zealand economy would suggest that New Zealand should adopt a much more circumspect approach to emissions reduction commitments. The implications of the set of arguments around creating incentives for innovation by New Zealand firms are ambiguous for New Zealand given the small size of the domestic market; it is the approaches adopted in global markets that are more likely to have an impact on the incentives of New Zealand firms to innovate.

Balancing these forces is an important, but challenging, priority for government. An additional factor that complicates the task of determining how best to respond to these effects is the significant uncertainty as to the opportunities and challenges generated by the indirect effects of climate change. There is obviously some scientific uncertainty with respect to climate change that remains to be resolved. But the uncertainty around the indirect economic effects is arguably even more significant.

It is possible to tell a range of very plausible stories, with supporting evidence, about the nature and significance of the indirect effects of climate change: it could be the perfect storm, with radical and disruptive change in consumer, company, and government behaviour, or it could be a storm in a teacup with much more hype than reality. There are good reasons to expect very substantial change in consumer preferences, as well as good reasons to expect that they won't change very much at all.³

This suggests that the strategic approach adopted by the government and by firms should be robust to a variety of different future scenarios. If the chosen approach only delivers significant value under one scenario, and would be inappropriate across a range of other scenarios, then it is inevitably riskier than an approach that delivers gains across a broad range of possible future states.

³ A future New Zealand Institute report will describe various future scenarios and the evidence that can be marshalled in support of these scenarios.

Governments and firms should not base their decision-making on unrealistic certainty, assuming that the world will look a particular way and disregarding alternatives. The costs and benefits of the various strategic approaches described above vary enormously depending on how the world evolves. For example, the global leadership position makes much more sense if there is radical, disruptive change in consumer preferences whereas it looks much less attractive if there is little change in consumer behaviour and if other governments do not follow through with their emissions targets. An appropriate response to one set of exposures may turn out to be a very poor idea if the world develops in a different direction. The economic value of a climate change-friendly national brand, for example, could vary significantly between these different scenarios.

The statements of various New Zealand political parties should similarly be assessed in this way. Are the commitments to carbon neutrality or steep reductions in emissions targets robust to a variety of possible future states – or do they only make sense under one scenario?

In general, the appropriate response to uncertainty is to delay taking irreversible decisions and wait for the uncertainty to reduce. There is a significant 'real option value' to waiting. Interestingly, few governments have actually undertaken significant behavioural changes yet even when they have outlined future commitments. Many of the commitments made by governments have 2050 as the target date, with few binding shorter-term targets.

Similarly, there are few instances of companies making 'bet the company' type investments in response to climate change. To the extent that companies are developing an exposure in areas like renewable energy they seem to be waiting to see how these events play out before making major commitments. Firms are more likely to be undertaking actions where they make economic sense independent of climate change – for example, energy conservation – or where they can enhance brand value without significant investments.

This suggests that the priority for New Zealand should be low risk areas of action that generate economic upside under a range of scenarios. This may be actions that are good ideas in general, but to which climate change concerns simply add a supporting argument (for example, housing insulation, energy efficiency, more demanding fuel standards, and the like). Indeed, IPCC estimates suggest that there is a significant amount of 'low hanging fruit' that can be obtained: reductions in emissions that do not require major changes to the economy but simply more efficient energy use.⁴

It may be, of course, that New Zealand has no realistic option but to make significant emissions reductions commitments because this becomes the world standard. Such commitments become a 'ticket to play' rather than a source of competitive advantage. As an example, backing out of Kyoto now is not a realistic option for New Zealand. However, to the extent that New Zealand has some discretion as to how to proceed, caution may be appropriate unless strong evidence can be provided to justify a more ambitious course of action. This is true for both the New Zealand government as well as New Zealand firms.

Beyond the relatively low risk actions open to New Zealand decision-makers, judgements need to be formed about whether further, more risky investments should be made – for example, ambitious emissions targets – and when these investments should be made. Some risks do need to be taken, but these should be taken in a calculated manner, and there should be ongoing monitoring of the development of these indirect effects so that actions can be adjusted as uncertainties are resolved.

Overall, decision-makers in both firms and government need to factor the significant amount of uncertainty around the indirect economic effects of climate change into their actions. Committing

⁴ Refer also to Per-Anders Enkvist, Tomas Naucler, and Jerker Rosander, 'A cost curve for greenhouse gas reduction', *McKinsey Quarterly*, 2007 Number 1.

to significant emissions reductions, which are likely to involve some costs on the New Zealand economy even with new technology, by appealing to the value of a national brand or some first mover advantage – around which significant uncertainty exists – requires a persuasive case to be made. Such a course of action may be exactly the right thing for New Zealand to be doing, positioning New Zealand to prosper in a changing global economy. Or it may impose significant costs on the New Zealand economy without significantly increasing the commercial value of the New Zealand brand.

The full range of strategic options should be considered, and the uncertain costs and benefits of these various approaches assessed, before long-lived and far-reaching commitments are made to respond to climate change.

Potential responses

A primary focus on the indirect economic effects of climate change broadens the range of possible actions that can be taken to position New Zealand. In particular, there are two, related, classes of actions that need to be considered by the government as part of its climate change strategy.

The first is those actions that are related to reducing New Zealand's emissions of greenhouse gases. These actions include setting emissions targets, introducing carbon taxes or a cap and trade regime, as well as measures to encourage energy efficiency and investment in renewable energy. For example, New Zealand has a particular exposure to methane emissions, and technologies that support a less emissions-intensive mode of agricultural production may generate significant economic benefits.

The second type of government action focuses on positioning the New Zealand economy to compete successfully in a carbon-constrained world. The key reason for New Zealand's high level of emissions intensity is the structure of the New Zealand economy, and the government's role should extend to acting to shift the New Zealand economy towards a structure that is less emissions intensive and accordingly is less exposed to the indirect economic effects of climate change.

Part of this will be achieved through the pricing of emissions and encouragement of renewable energy, but there are more actions that can be considered. For example, concern about climate change supports the argument for encouraging the creation of a weightless economy in New Zealand by investing in communications infrastructure and in knowledge and innovation. Such an economy will have a less emissions-intensive mode of operating. Seen from this perspective, broadband policy may be one of the more significant things that New Zealand can do to respond to climate change.

The advantage of this second class of action is that it is relatively low risk. In a report released earlier this year, the New Zealand Institute argued that creating a weightless economy was a good way for New Zealand to overcome the effects of its physical remoteness.⁵ Climate change simply adds another supporting argument, as the benefits become larger than may otherwise be the case.

These two types of government actions are mutually reinforcing, but it is important to understand that the government responsibility extends beyond committing to an emissions reduction. The objective of climate change policy is more than simply the reduction of emissions.

And, as much of the previous discussion should indicate, a significant component of the New Zealand response to climate change will come from New Zealand firms. There are some actions that only the government can take, but private sector behaviour is of fundamental importance to the success of the New Zealand response.

⁵ David Skilling & Danielle Boven, 'So Far Yet So Close: Connecting New Zealand to the global economy', New Zealand Institute Discussion Paper, 2007/1, March 2007.

Indeed, in responding to changing consumer preferences, the actions of companies like Fonterra, Zespri, and Air New Zealand, in reducing their emissions may be of far greater consequence than government commitments to reduce overall national emissions. It may be better to deal with changing consumer preferences at the firm or sector level, rather than trying to establish a national brand through ambitious emissions targets. Firms and industries will respond to the extent that there is a market incentive to do, by innovating, reducing their emissions footprint, and so on.

It is not immediately obvious that the incremental value of a national brand is significant over and above the value of brands that are developed by individual firms, although it may be important that the national brand is broadly consistent with the brands that are developed by New Zealand firms.

4. CONCLUDING REMARKS

New Zealand has substantial economic challenges and opportunities facing it over the next few decades. The economic rise of Asia, which brings world markets closer to New Zealand, and the development of new communications technologies and business models that in principle have the ability to reduce the effects of New Zealand's physical remoteness, both offer New Zealand significant upside. However, these developments also raise the competitive intensity of the global economy in which New Zealand operates.

New Zealand needs to understand these forces and position itself appropriately. It is not sufficient to adopt an opportunistic, reactive approach. Although New Zealand is a small country, and cannot exert significant influence over these forces, it can act so as to manage the risks and seize the opportunities that present themselves.

Climate change is another global trend that is likely to have a significant effect on the New Zealand economy over the next several decades, and to which New Zealand will need to respond. The direct effects of climate change, and particularly the indirect effects of climate change, are a source of considerable economic risk and opportunity for New Zealand.

This essay has argued that New Zealand need to understand the nature of its key exposures to climate change, and develop a strategic response that incorporates the significant uncertainties around the extent of these exposures. This suggests that a disciplined, strategic approach is required before significant commitments are made.

Over the next several months, the New Zealand Institute will be undertaking a programme of research on these issues. This work will be particularly focused on the indirect effects of climate change and better understanding the significant uncertainty, with the aim of providing guidance to decision-makers as they act to position New Zealand to respond to the effects of climate change.