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# Issues in Communicating the Impacts of Climate Change Policy Options

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and Nigel Jollands



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Steve Hatfield-Dodds (CSIRO) and Nigel Jollands (NZCEE)

Final Project Report

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***“A study on the impact of framing and communication of the expected impacts of climate change and climate change policy options on people’s understanding and attitudes to potential policy responses”***

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# Executive Summary

Responsive democratic governance depends crucially on a clear public understanding of policy issues and expected impacts. Climate change is an unusual issue in terms of the range of impacts, timeframes, and uncertainties involved. These differences mean that approaches and habits that work elsewhere may be misleading for climate change issues.

Economic modelling of the impacts of reducing greenhouse gas emissions overwhelmingly finds that the emission reductions scenarios are associated with lower, but still positive, rates of economic growth relative to the 'business as usual' scenario. These studies – and the news headlines that report them – then describe the difference between the base case and the policy scenarios as the 'cost' of reducing emissions.

The research undertaken in this project suggests that this common economic shorthand is likely to mis-communicate the impact of taking action to reduce greenhouse emissions, and mislead a significant portion of the general public by conflating ideas of 'cost' and 'opportunity cost'. In particular, this language may be understood as implying that climate

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**The key finding of the study is that cost framing materially reduces expressed support and increases apparent opposition, relative to descriptions that provide more complete information.**

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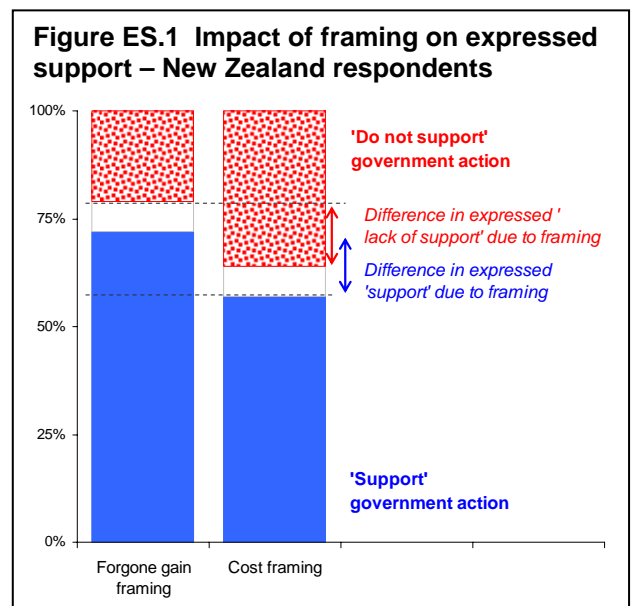
policies will reduce economic living standards relative to current levels – which is not true of any emissions reductions target under consideration. This mis-communication is important because people are, in general, more willing to accept policies that involve sacrificing some portion of future improvements in living standards than policies that involve reductions from current living standards.

This project explored these issues through a split-sample phone survey that assessed the effect of how impacts are communicated on attitudes towards action on climate change. The survey covered 1852 respondents in New Zealand and Australia. Information on impacts was based on recent Australian modelling of achieving a 60 per cent reduction in emissions by 2050. The study found that conventional language describing impacts in terms of 'cost' are associated with lower levels of support and higher levels of opposition to (or lack of support for) government action, compared to descriptions of impacts in terms of forgone gains. In quantitative terms, 57 per cent of New Zealand respondents supported action with cost framing, while 73 per cent supported action when it was communicated that incomes will rise, but rise less than they would without policy action.

This implies that providing more complete information on impacts changed the expressed attitude of around one in six respondents. These findings are consistent with the valuation literature and wider behavioural theory.

One practical implication of this research is that the effect of existing communication bias appears large enough to constrain policy formulation, preventing or delaying the development of policies that would attract widespread public support if communicated appropriately.

A second practical implication of this study is that governments and others committed to responsive governance should take care to describe future impacts of policy options relative to current levels and benchmarks, as well as relative to future levels that would be achieved in the absence of policy action.





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# Section I

## Why this research matters

### Introduction

Economic modelling of the impacts of reducing greenhouse gas emissions overwhelmingly finds that the emission reductions scenarios are associated with lower, but still positive, rates of economic growth relative to the 'business as usual' scenario. These studies – and the news headlines that report them – then describe the difference between the base case and the policy scenarios as the 'cost' of reducing emissions.

This broad approach is likely to result in a systematic misunderstanding of the impacts of climate change policy action, particularly emissions reductions policies. This is for two main reasons.

First, assessments of emission reductions do not take account of the range of predicted direct climate impacts, such as reduced precipitation and more frequent and severe storms, floods, and other extreme events. These impacts are expected to be adverse for most nations (see Stern 2006).

Second, the communication of these assessments typically gives no attention to potential framing effects related to describing impacts in terms of 'losses' or 'costs' rather than forgone gains. Economic theory treats these all as opportunity costs, and most economists involved in climate change issues do not differentiate between these different types of impacts. Empirical studies, however, suggest people are much more concerned by reductions from current levels than by foregone gains. These studies typically indicate that the compensation required to offset a loss is at least double that associated with an equivalent gain (Tversky and Kahneman 1991). Related studies that account for a wider range of factors report that the value associated with 'willingness to accept' a loss is typically seven times the value associated with 'willingness to pay' to prevent the equivalent outcome (see Horowitz and McConnell 2002).

This study focuses on assessing the impact of this second issue, which – unlike the first – is not widely recognised within the climate change policy community.

This issue is relevant to policy development because anecdotal evidence suggests that many people are under the misapprehension that achieving significant reductions in greenhouse gas emissions and climate change risks will require reductions in living standards from current levels. In fact, however, economic studies of deep cuts in emissions indicate significant rises in living standards are expected, typically more than doubling over the next 40-50 years (see Grubb 2006, The Allen Consulting Group 2006). This misunderstanding is likely to result in reduced public support for effective greenhouse action and risks resulting in long term climate impacts that could have been avoided if citizens had been given a clearer understanding of the real economic consequences of different policy choices.

## Policy context

Crafting effective and acceptable policy responses to climate change is enormously challenging, involving both extraordinarily difficult international political economy, major uncertainty (including due to system responses 10-100 times longer than normally dealt with by public policy), and the first ever policy decision that requires explicitly accepting a decrease in the long run rate of economic growth.

### *Historical policy framing*

Until late 2005, the New Zealand Government's climate-change policy was characterised by four key elements:

1. A carbon tax on energy, industrial and transport emissions, capped at \$25 per tonne of CO<sub>2</sub>e.
2. Negotiated Greenhouse Agreements (NGAs) for "at risk" large emitters.
3. Projects to Reduce Emissions (PRE), which would provide Kyoto units to induce projects that would generate additional emissions reductions.
4. Industry and government funding of research in the agricultural sector.

In line with public debate and policy development across the OECD, most of New Zealand's climate change policy has been framed in terms of costs, rather than forgone gains. In some cases this framing has been consistent with everyday ideas of 'costs'. For example, the government used the following language in fleshing out the carbon tax policy in 2002:

*The carbon tax will be set at \$15 per tonne and introduced in April 2007. As outlined in 2002, this will add around one cent to the cost of a unit of electricity, about 4 cents to a litre of petrol, 46 cents to a 9kg bottle of LPG and 68 cents to a 20kg bag of coal. The impact on the typical Kiwi household will total about \$4 per week for electricity, petrol, and other fuels. It has been designed to allow for a future transition to emissions trading.*

*If we are going to tackle climate change, we need to start taking environmental costs into account in the economic choices we make. The carbon tax introduces a price differential between clean and polluting energy sources that reflects their environmental costs, so individuals and businesses can make informed choices."*

NZ Government (2005)

This pricing information is an important part of communicating the likely impacts of the proposed climate policy. In strict terms, this sort of information could also have been accompanied by information on how other costs might have been reduced, such as through reductions in selected government taxes or charges, although the media and general public are often inclined to discount such information. This additional information would reflect that these impacts are costs to individuals but transfers at the national level.

In other areas of public debate, cost language appears to have been used in ways that might be misunderstood as involving a reduction in living standards from current level. Press reports and commentators refer to policy action "imposing serious costs on the

economy” (New Zealand Business Roundtable (NZBR) 2006), or describe international studies indicating projected job losses in the hundreds of thousands across Europe and North America. This language explicitly evokes notions of net adverse impact that are not necessarily implied by the early examples of changes in relative prices of energy or carbon intensive products. While many of these media stories are seeded by groups opposed to emissions constraints, more balanced assessments are also frequently framed in terms of likely direct costs of climate change versus the costs of reducing emissions (see, for example, the NZ Climate Change Office (2006) discussion of ‘What are the costs of climate change to New Zealand?’). These direct impacts generally involve a reduction in environmental amenity or security from current levels (on average from current levels), while the impacts of emissions reductions are frequently either a transfer between members of the community or a forgone gain.

### ***Current policy framework and international context***

In May of 2005 the Ministry for the Environment completed revised projections of New Zealand’s greenhouse gas emissions, which indicated that “New Zealand would fall short of meeting its Kyoto Protocol target by 36Mt CO<sub>2</sub>e” (Review of climate change policies p 10). As a result of the new projections, the Government looked at the implications for New Zealand if current, alternative, or additional climate change policies were adopted.

Following consideration of the review, the Government announced, in December 2005, that it “is not proceeding with its proposed carbon tax and will instead consider other ways to ensure New Zealand meets its commitments to cut greenhouse gas emissions” (Parker 2005). Decisions on New Zealand’s new climate change policy framework are currently under consideration.

New Zealand is not alone in its struggle to find acceptable mid-term policies to deal with climate change. The task is made more challenging by consolidation of the scientific evidence on the extent of climate risks and the timeframe for beginning action. Current international thinking suggests that achieving the United Nations Framework Convention on Climate Change (UNFCCC) goal of stabilising greenhouse gas concentrations “at a level that would prevent dangerous anthropogenic interference with the climate system” will involve reducing emissions in high income countries by 60-80 per cent from 2000 levels by 2050. This assumes that developing countries, such as China, India and Brazil, will not be required to limit their emissions to the same extent, with mandatory action in these countries possibly beginning around 2030. The UK Prime Minister, Tony Blair, has adopted a target of 60 per cent reductions by 2050, following advice from the UK Royal Commission on Environmental Pollution. This is consistent with expert analysis and policy recommendations in Sweden, the European Union and the United States (Australian Business Roundtable on Climate Change 2006).



## Section 2

# Research objectives and method

### Project objectives

The objectives of this project are to:

- provide a rapid test of the significance of framing effects (as outlined in the introduction above) on reported levels of support for government action to address climate change; and
- contribute to more in-depth research into these issues over the coming months.

### Project design and success factors

Key issues for the successful delivery of this research are to ensure that:

- results are robust and reliable;
- interpretation is relevant to policy formation;
- the research adds value to wider effort and inquiry on these issues.

Delivery of reliable and robust research requires good survey design and high quality implementation. It is good design practice to communicate information on impacts in concrete, every day terms so that people are able to imagine and respond to the information provided. It is also important that the level and nature of the impacts are considered salient (or material) by respondents. The researchers or providers who undertake the survey should be experienced and use an appropriate quality assurance framework.

To maximise the policy relevance of this research it is also desirable to benchmark the magnitude of the impacts used against credible estimates of the impact of deep cuts in emissions in Australia and New Zealand.

The project was designed to provide new information on attitudes and framing effects in New Zealand, extending a survey that was being planned for Australia. In addition to gathering New Zealand data that otherwise would not have been collected, this provides a larger total sample for the combined work (increasing reliability and allowing finer scale analysis of some issues), and helps explore these issues across different specific political and institutional contexts. The combined phone survey has also been designed to complement an internet-based survey, discussed in more detail on page 15.

### Research method

These objectives were achieved through designing and undertaking split-sample phone surveys exploring 'deep cuts' in emissions. This presents different sub samples of respondents with different descriptions of estimated outcomes of the same policy scenario, and allows us to quantify the significance of framing economic impacts in terms of 'costs' or 'forgone gains' in terms of the difference in respondents' willingness to support policy action. Estimated impacts were benchmarked against modelling

undertaken for the Australian Business Roundtable on Climate Change.

### **Survey design and implementation**

Roy Morgan Research was contracted to undertake the phone survey in New Zealand and Australia. The study questions described in Box 1 were included in their regular Australian and New Zealand omnibus surveys, using identical survey methods. These omnibus surveys provide economies of scale through combining questions for a number of clients and standard demographic questions in a single survey framework. An additional advantage is that the key referendum style question used fits well into this type of survey, reducing potential respondent bias. The survey covered 1852 respondents, including 959 New Zealand residents, and was conducted in late March and early April 2006.

#### **Box 1. Survey Questions and Script**

I'd now like to ask you a couple of questions about climate change and government policy.

Q1. On a scale of 1 to 5, where 1 means very little knowledge and 5 means a lot of knowledge, how would you rate your knowledge of climate change issues?"

[ 1 – VERY LITTLE KNOWLEDGE ... 5 – A LOT OF KNOWLEDGE ... ]  
[ 6 – CAN'T SAY ]

Scientists generally agree that human activity, particularly burning fossil fuels, is contributing to a gradual change in the earth's climate. This is likely to result in increasing average temperatures, changes in rainfall, and more intense floods, storms, droughts and heat waves. Governments could take action to reduce the risks of climate change, but these actions would have costs.

[ONE THIRD OF TOTAL SAMPLE ASKED EACH OF THE FOLLOWING]

Q2 (a) Would you support Government action to substantially reduce the risk of climate change ... *if the cost to the country of this action was, on average, about \$11 per person per week from now till the year 2050?*"

(b) Would you support Government action to substantially reduce the risk of climate change ... *if this action meant that, on average, personal incomes in this country would grow 11 percent more slowly than they would have from now to 2050?*

(c) Would you support Government action to substantially reduce the risk of climate change ... *if this action meant that personal incomes in this country would grow more slowly – rising, on average, by \$350 per year rather than \$400 per year from now till the year 2050?*

[ YES – would support government action ]  
[ NO – would not support government action ]  
[ CAN'T SAY ]

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The main purpose of this framing is to test whether people respond differently when

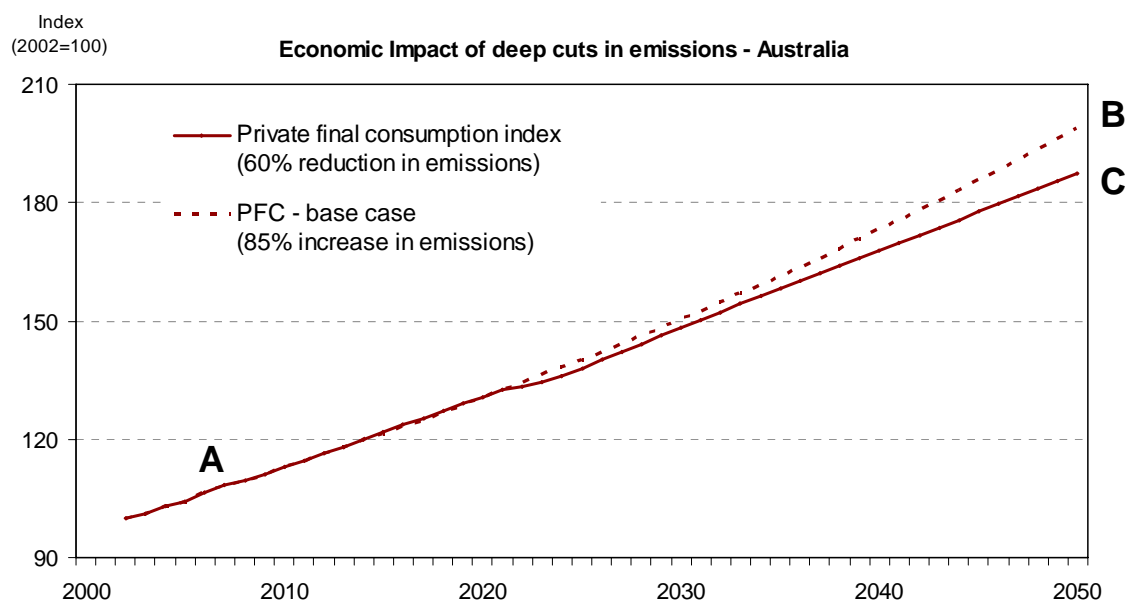
presented information framed in terms of (a) cost without any reference to underlying increases in income, or (b, c) forgone gains in income that would otherwise have been expected to occur.

### **Estimates of economic impacts**

The figures referred to in the questions are based on economic modelling of deep cuts in Australian emissions, undertaken for the Business Leaders Roundtable on Climate Change (see [www.businessroundtable.com.au](http://www.businessroundtable.com.au)). This is the only economic analysis in the public domain for emissions reductions of this magnitude by Australia or New Zealand. It was released on 6 April 2006, after the phone survey was conducted, and was not referred to explicitly in the survey. The 'early action' scenario used for these figures involved emissions reductions of 60 per cent from year 2000 levels by 2050, compared to a business as usual scenario with around an 85 per cent increase in emissions.

The 'cost' version (Q2.a) represents the average value of the 'consumption gap' from 2005 to 2050. Graphically, this is the average height of the triangle ABC in Figure 1 below. The two 'forgone gains' versions (Q2.b,c) provide information on the increase in income with and without policy action, equivalent to the increase from A to B (without action) and from A to C (with policy action).

**Figure 1 Modelling results used to benchmark economic impacts of policy action**



Source: Data from ACG (2006)



## Section 3

# Research results and policy implications

### Results

This section outlines the major results of the survey, focusing on respondents self-reported knowledge of climate change issues, levels and patterns of support for climate change action, and findings on the importance of framing effects.

#### *Self reported knowledge of climate change*

As shown in Table 1, around a quarter of NZ respondents considered themselves knowledgeable about climate change issues (scoring 4 or 5 out of 5). Most respondents ranked themselves in the middle (40 per cent), with around a third of respondents reporting low levels of knowledge. Women reported low levels of knowledge more often than men.

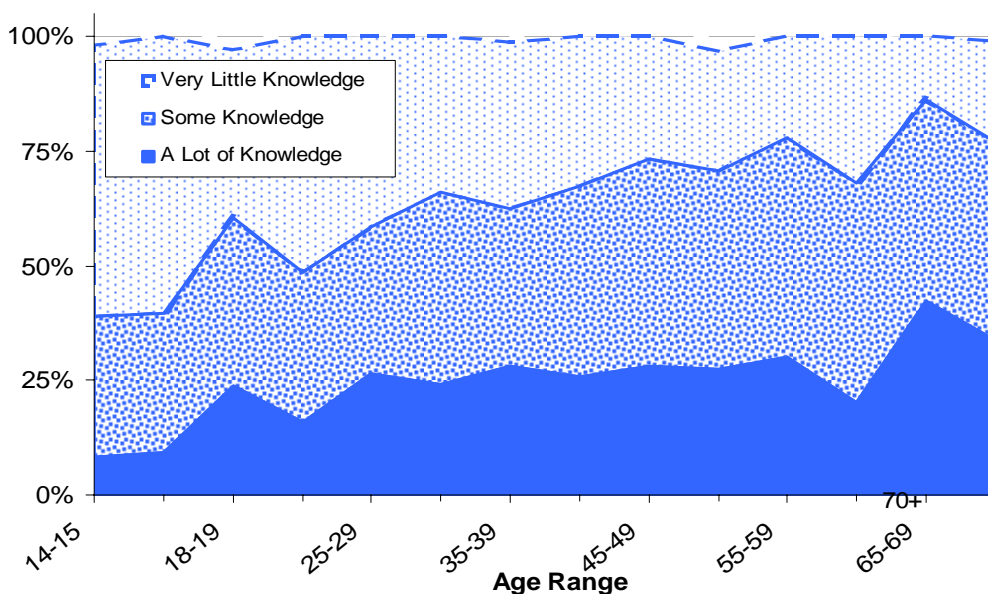
**Table 1. Self-assessed knowledge of climate change**

Response:	New Zealand			Australia		
	Women	Men	Total	Women	Men	Total
1 – VERY LITTLE KNOWLEDGE	13%	11%	<b>12%</b>	19%	13%	<b>15%</b>
2	26%	17%	<b>22%</b>	22%	24%	<b>24%</b>
3	40%	40%	<b>40%</b>	40%	33%	<b>37%</b>
4	14%	23%	<b>18%</b>	15%	19%	<b>17%</b>
5 – A LOT OF KNOWLEDGE	6%	9%	<b>7%</b>	4%	10%	<b>7%</b>
CAN'T SAY	1%	..	<b>1%</b>	1%	1%	<b>1%</b>
TOTAL	100%	100%	<b>100%</b>	100%	100%	<b>100%</b>
Sample Size	486	473	<b>959</b>	438	455	<b>893</b>

Notes: Responses to Q1, Box 1. Respondent segments weighted by population demographics.

As shown in Figures 2 and 3, self reported knowledge rises with age, with around twice as many respondents under 25 years reporting lower knowledge than respondents over 50 years. Knowledge does not appear strongly related to income (noting that sample sizes in upper income brackets are relatively small).

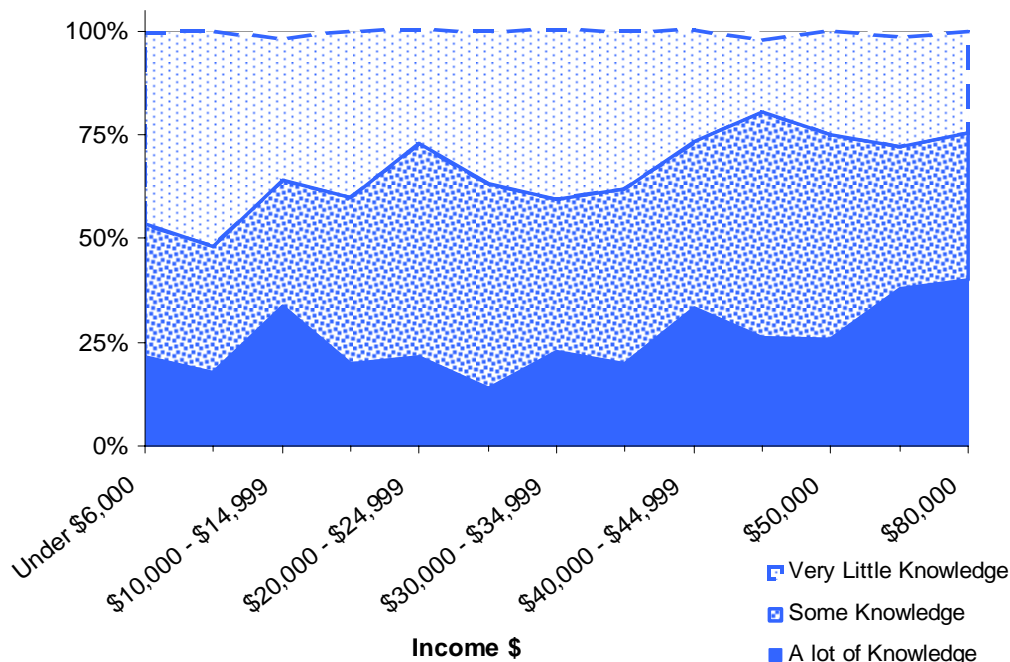
**Figure 2. Self reported knowledge by age – New Zealand**



Note: Shares of respondents may not add to 100% due to 'cant' say' responses (see Table 1)

**Figure 3. Self reported knowledge by income – New Zealand**

**Figure 3: Self reported knowledge by income - New Zealand**



Note: Shares of respondents may not add to 100% due to 'cant' say' responses (see Table 1)

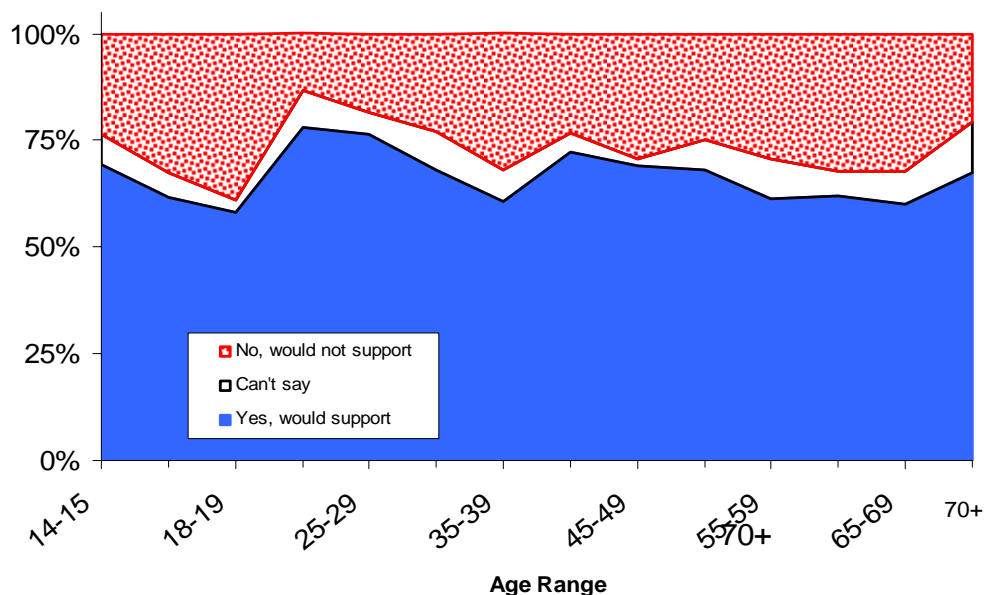
### ***Overall support for action to reduce climate change***

Significantly more than 50 per cent of respondents supported government action to reduce climate change risks, with higher levels of support expressed when impacts were

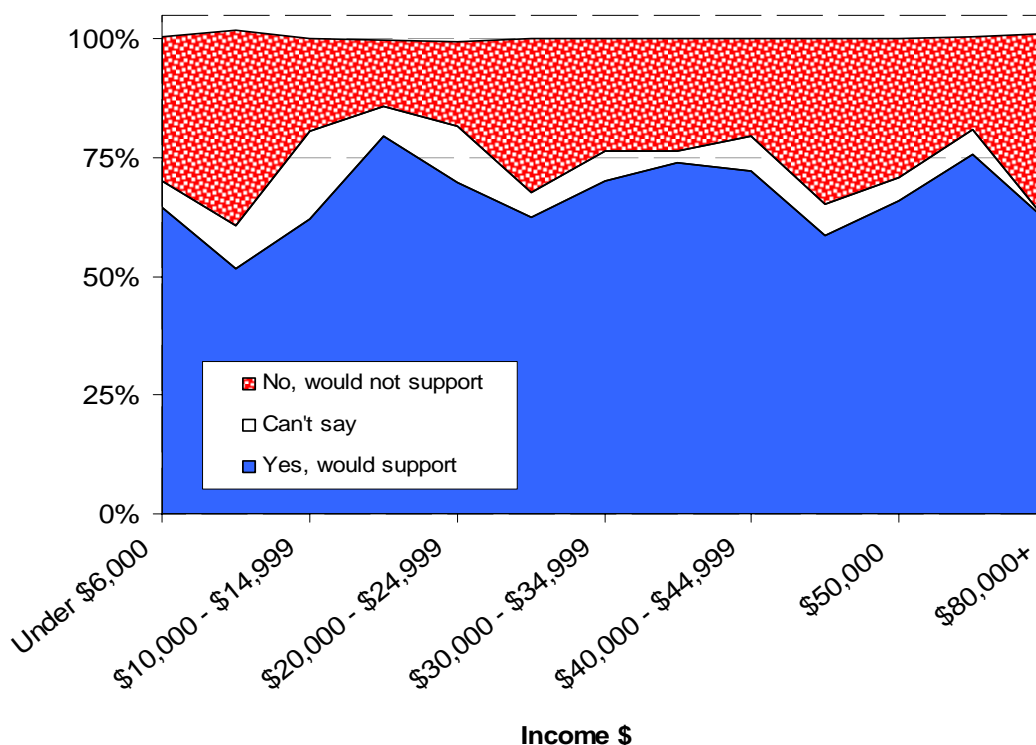
framed in terms of forgone gains.

Attitudes towards government action did not vary systematically with age or income, as shown in Figures 4 and 5 (although the share of undecided respondents appears to decline a little with income). Higher levels of self-reported knowledge were associated with higher levels of support for government action (see Figure 6 below).

**Figure 4. Support for government action by age – New Zealand**



**Figure 5. Support for government action by income – New Zealand**



Levels of support for government action were lower in New Zealand than in Australia, with reported support of 65 per cent in New Zealand versus 81 per cent in Australia (weighting the two framings equally). Australians also reported half the level of ‘can’t say’ responses.

### **Support by location and occupation**

Self reported knowledge and support do not appear to vary widely by area (classified as Auckland, Wellington, other Northern, Christchurch, and other Southern).

Self reported knowledge and support do appear to vary somewhat by occupation, with professionals, managers and farm owners reporting higher than average levels of knowledge, and managers and farm owners reporting lower than average levels of support.

Interestingly, farm owners report the highest levels of self reported knowledge, lowest levels of support, and the highest levels of ambivalence – reflected in “don’t know” responses more than four times the average – of all the occupational groups. Lack of support for (or opposition to) substantial action on climate change is higher than average but similar to professionals, owners generally and sales occupations, and lower than managers. The atypical results for farm owners contrast with those for farm workers, which are close to the average for all occupations for both knowledge and support.

Detailed results for area and occupation are presented in Figures 9 to 12 in Appendix A. Sample sizes for specific occupations – particularly farm owners and farm workers – are very small, and specific results should only be considered to be indicative.

## **Evidence of framing effects**

The key finding of the study is that cost framing materially reduces expressed support and increases apparent opposition (or lack of support), relative to expressed support where respondents are given more complete information.

As shown in Table 2 and Figure 6, 57 per cent of New Zealand respondents supported action when impacts were framed only in cost terms, while 73 per cent of respondents supported action when impacts were framed in terms of forgone gains (where information was provided on increases in income with and without government action on climate change). This implies that providing more complete information on impacts changed the expressed attitude of around one in six respondents. In terms of proportional impact, cost framing reduces expressed support by 28 per cent and increases opposition by 77 per cent in New Zealand respondents. These impacts are material, but modest in the context of wider behavioural research (which commonly suggests cost framing would be likely to reduce expressed support by 50 per cent or more), due to the relatively high underlying level of support.

**Table 2 Support for government action with ‘cost’ and ‘forgone gain’ framing**

Question:	New Zealand			Australia				
	cost	forgone gain	Impact	cost	forgone gain	impact		
	(a)	(b)	(c)	(a)	(b)	(c)		
SUPPORT GOV'T ACTION	57%	72%	73%	-28% (e)	75%	86%	86%	-12% (e)
DO NOT SUPPORT	36%	21%	21%	77% (f)	22%	11%	10%	90% (f)
CAN'T SAY	7%	7%	6%		3%	4%	4%	
TOTAL	100%	100%	100%		100%	100%	100%	
Sample Size	304	342	313		288	314	291	

Notes: (d) = average (b,c); (e) = (d-a)/(a); (f) = (a-d)/(d)

**Figure 6. Impact of framing on expressed support for government action – New Zealand**

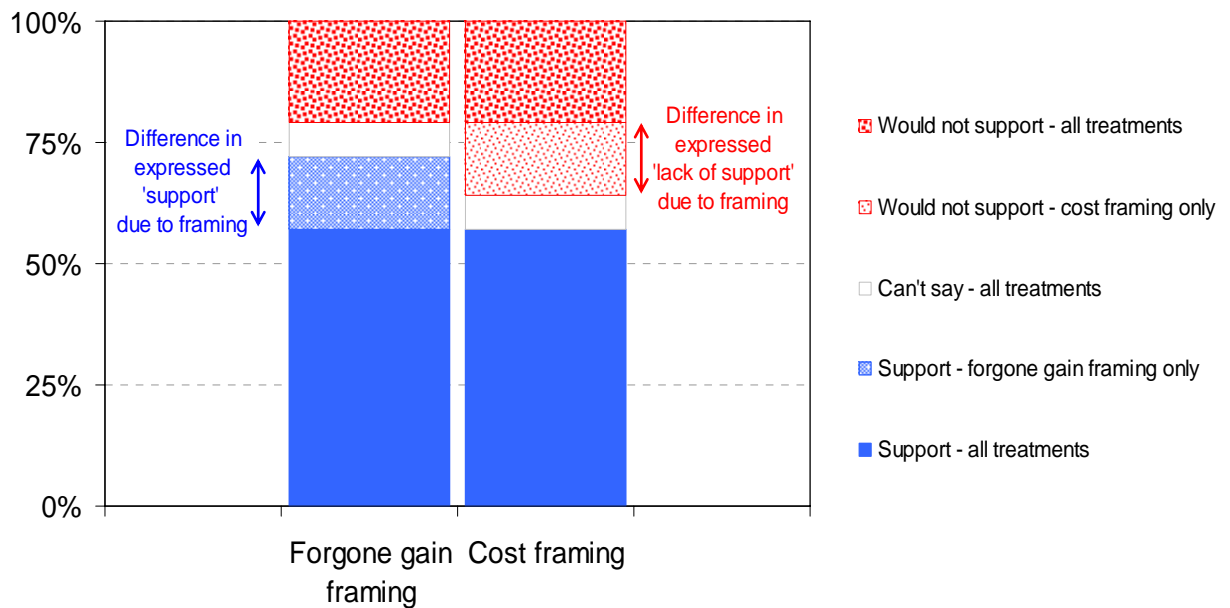
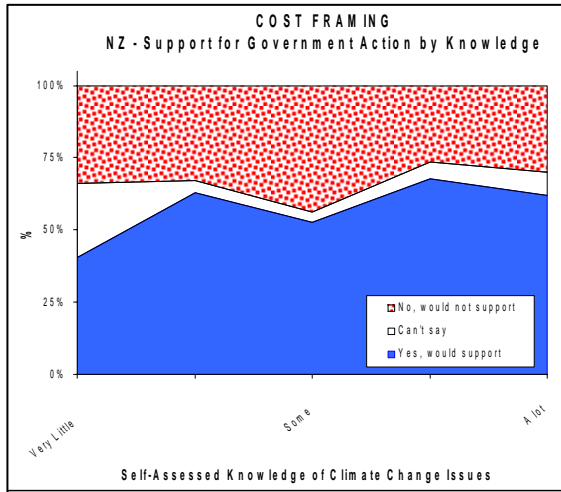


Table 2 also indicates that levels of support for treatments (b) and (c) were almost identical within both New Zealand and Australia, despite these treatments using different language and numerical measures to communicate the forgone gain associated with the policy choice (see Box 1, page 8). This gives additional confidence that the results reflect the substantive framing effect, rather than other more cosmetic differences in language.

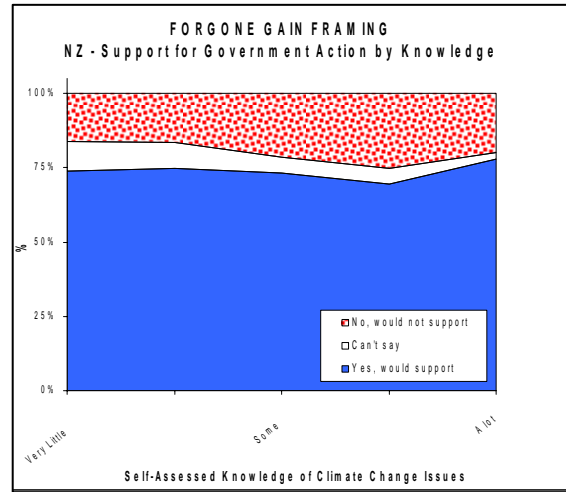
More detailed analysis indicates that framing effects may be more pronounced for the 33-39 percent of people who are less knowledgeable about climate change issues (see Table 1, page 10). Comparing the panels N-1 with N-2 and A-1 with A-2 in Figure 7 we see both higher levels of support associated with communicating impacts as forgone gains, and – particularly for New Zealand – a small decrease in the share of voters who neither support nor oppose government action. This appears, in part, to reflect higher levels of support for government action among people reporting higher levels of knowledge of climate change issues.

**Figure 7. Support for government action by self reported knowledge: cost and forgone gain framing – New Zealand and Australia**

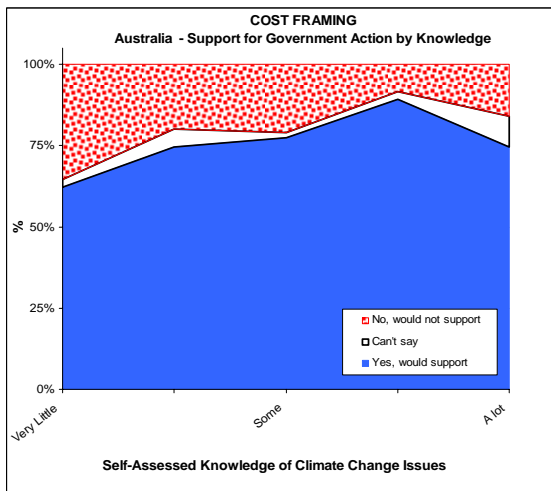
*N-1: Cost framing – New Zealand*



*N-2: Forgone gain framing – New Zealand*



*A-1: Cost framing – Australia*



*A-2: Forgone gain framing – Australia*

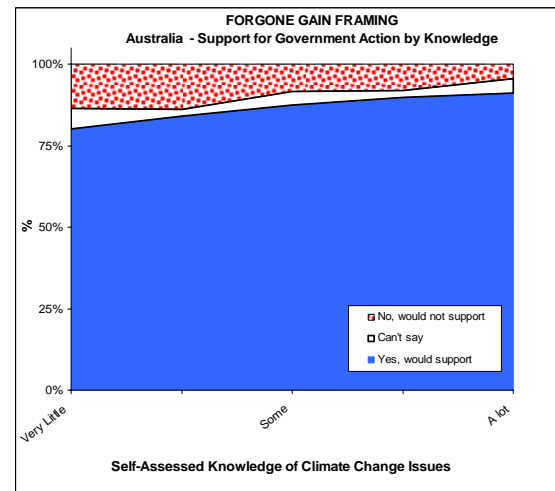
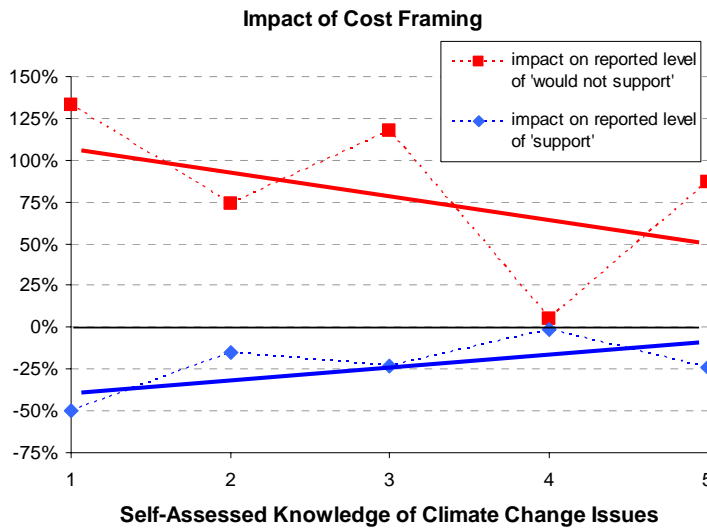


Figure 8 combines the New Zealand and Australian samples (to give higher numbers of respondents in each sub-segment). While the pooled observations show high levels of variation, the data provides some support for the hypothesis that framing effects are stronger for those with lower levels of knowledge or who are less confident in their understanding.

**Figure 8. Impact of cost framing on support for government action by level of self reported knowledge – New Zealand and Australia**



## Further work

The project team is also involved in a parallel research project that is exploring these issues in more depth using an internet based survey. This survey has only been funded for Australia at this stage, and extends the phone survey method in a number of ways.

First, internet technology and a larger sample size allows different respondents to be presented with a much wider range of potential impacts – up to eight times the relative impact presented in the phone survey. (The impact of policy action on climate change is kept constant across treatments, while different levels of economic impacts are presented to different respondents.) This tests the sensitivity of respondents to the magnitude of the impact described, and allows quantification of framing effects over a wider range of potential opportunity costs.

Second, the survey design will specifically test whether people react differently to cost questions framed in terms of “reductions in average income ... *from what it would be otherwise*” versus “... *from its current level*”. This will provide additional confidence in assessing the degree to which economic language (suitable for technical audiences) may be mis-communicating to or misleading the general public.

Third, the survey will provide much more detailed information on climate change issues, allowing more informed judgements about whether to support or not support policy action. Among other things, comparing these results with the phone survey will give insights into the importance of detailed contextual information in shaping (or not shaping) attitudes towards policy action.

## Implications for policy development

The initial results indicate that conventional descriptions of policy impacts, framed in terms of costs, will tend to understate public willingness to support policy action. Discussion of these issues with a wide range of stakeholders suggests that many people – including some deeply involved in greenhouse issues – presume that deep cuts in emissions will require real reductions in living standards, rather than smaller increases in living standards. In quantitative terms, underlying support would be expected to be lower where the impact of opportunity cost of action was higher, and so framing effects – and communication bias – would be expected to be larger for more difficult or contentious social choices. (This issue will be tested through the parallel internet survey described above.) This suggests framing effects are likely to become more significant as policy contemplates the task of achieving reductions in emissions that are significantly larger than those contemplated in the first UNFCCC commitment period.

Avoiding framing effects and communication bias is important for sound policy development on a number of levels.

Responsive democratic governance depends crucially on a clear understanding of the policy issues and expected impacts. Climate change is an unusual issue in terms of the range of impacts, timeframes, and uncertainties involved. These differences mean that approaches and interpretive habits that work well in other contexts are often misleading when used to evaluate climate change issues.

The preliminary results reported here suggest that common economic shorthand that conflates ideas of 'cost' and 'opportunity cost' is likely to mis-communicate the impact of taking action to reduce greenhouse emissions, and mislead a significant portion of the general public. In particular, this language may be taken to imply that climate change policies will reduce economic living standards relative to current levels – which is not true of even the most ambitious emissions reductions under consideration. This mis-communication is important because people are, in general, more willing to accept policies that involve sacrificing some portion of future increases in living standards than policies that involve reductions in living standards. This mis-communication – if allowed to persist – thus risks constraining the ability of democratic governments to develop and implement effective policy responses to the risks posed by climate change.

One practical implication of this research is that the effect of existing communication bias appears large enough to constrain policy formulation, preventing or delaying the development of policies that would attract widespread public support if communicated appropriately.

A second practical implication of this study is that governments and others committed to responsive governance should take care to describe future impacts of policy options relative to current levels and benchmarks, as well as relative to future levels that would be achieved in the absence of policy action.

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Additional results

Figure 9 Self reported knowledge by area – New Zealand

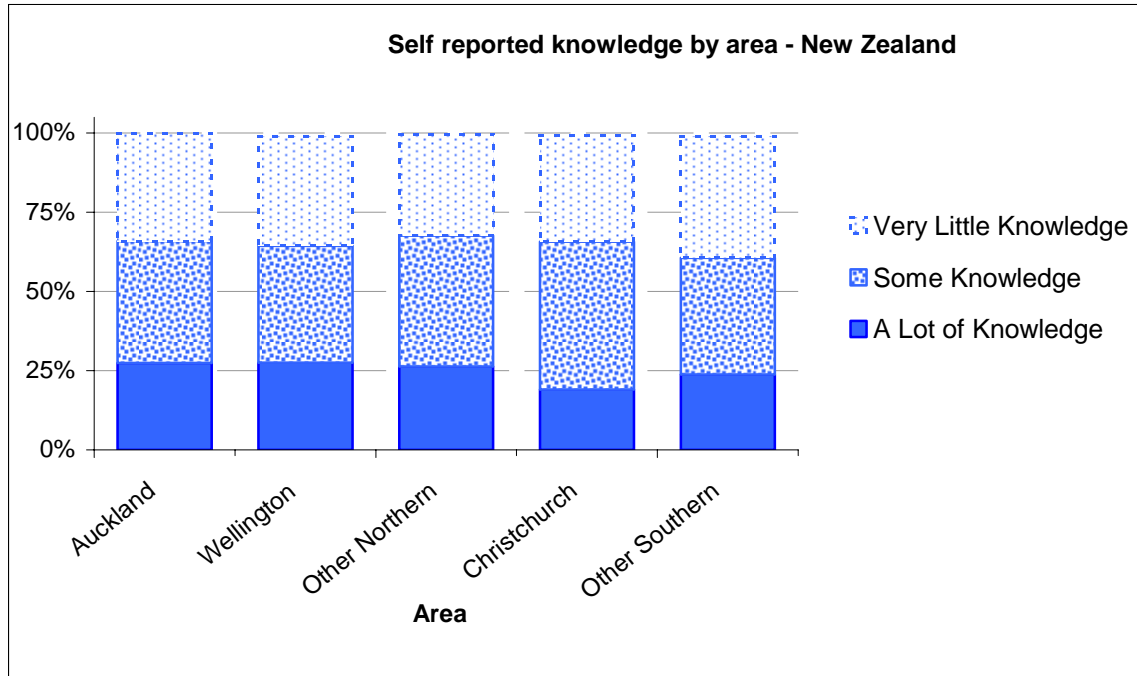
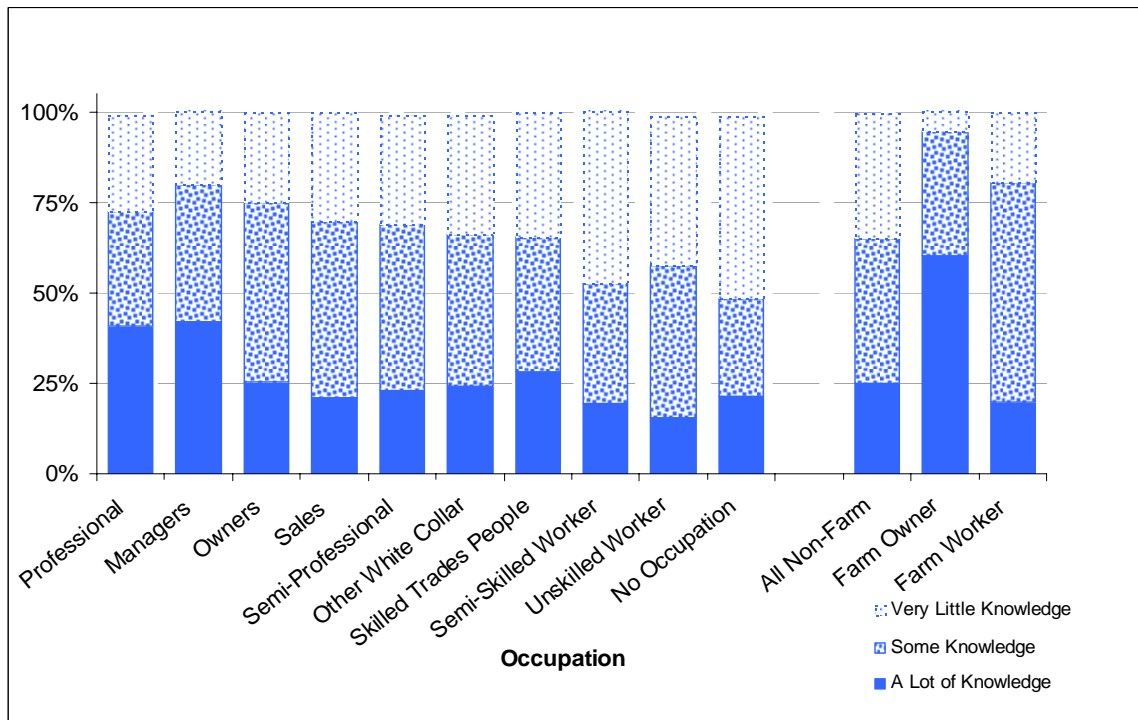
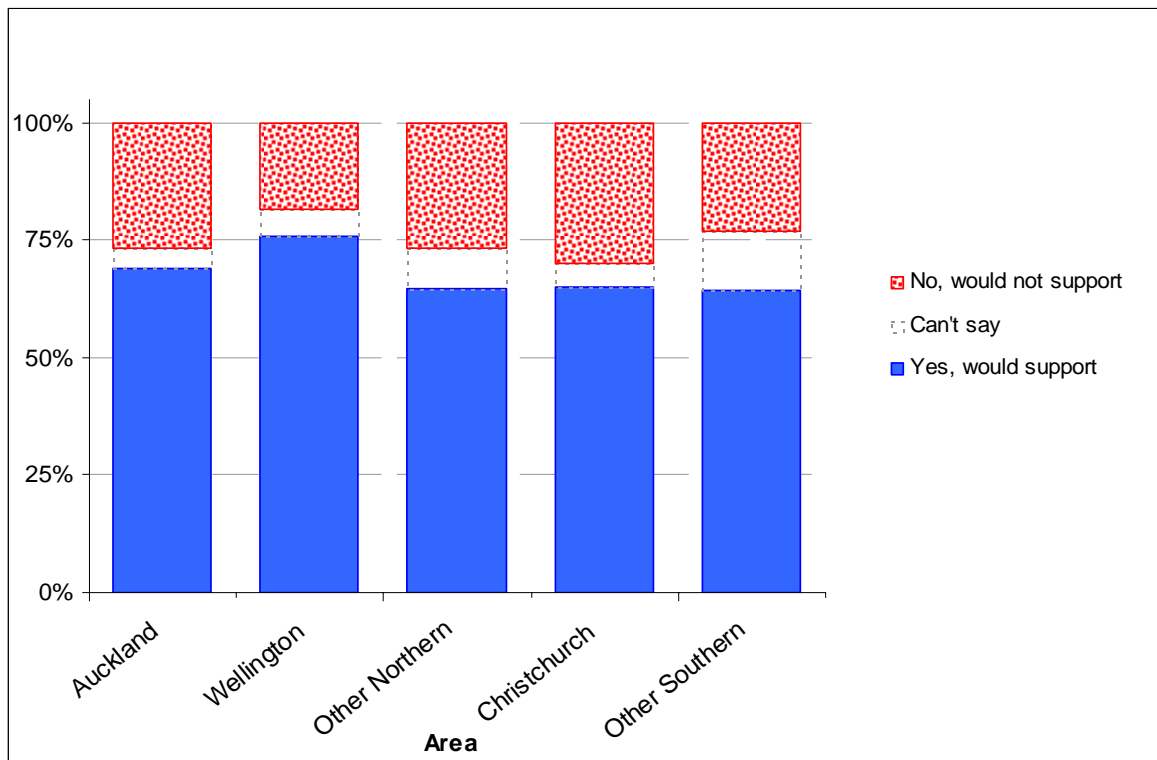


Figure 10 Self reported knowledge by occupation – New Zealand



**Figure 11 Support for government action by area – New Zealand**



**Figure 12 Support for government action by occupation – New Zealand**

