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Anita Talberg and Stephen Howes

CCEP working paper 8.10, October 2010

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Party divides: expertise in and attitude towards climate change among Australian Members of Parliament

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Abstract

This study investigates Australian federal politicians' expertise in and attitudes towards climate change. Telephone interviews were conducted with a sample of 26 Members of Parliament (MPs). Results of the survey, undertaken in late 2009, suggest that climate change expertise is low to moderate among MPs, and that there is no correlation between expertise in and concern about climate change. The survey reveals important differences in attitudes to climate change by party. About 40 per cent of Coalition (Liberal and National) MPs are climate change 'deniers', but no Labor Party (ALP) MPs are. ALP MPs rate climate change as the most important (with water management) out of four long-term challenges, but Coalition MPs rate it as the least important (after not only water, but also aging and defence). All ALP MPs think climate change demands urgent action, and that Australia should play a leadership role globally, but only about one-fifth of Coalition MPs does. Even those Coalition MPs who are climate change 'believers' tend to give lower importance to climate change than ALP MPs.

Keywords: climate change, Australia, political attitudes.

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Introduction

Studies have shown that in Australia public levels of concern over climate change are high and there is a demand for government action (Akter & Bennett 2009). All major political parties went into the 2007 election supporting an emissions trading scheme (ETS), and in 2009 the Labor Government unveiled its version of such a scheme, the Carbon Pollution Reduction Scheme (CPRS). There was strong resistance to the CPRS, but the Government negotiated with the Coalition Opposition on the design of the scheme to guarantee the Bill's passage through the Senate. Not long after a compromise agreement was reached (in late November 2009), the leader of the Opposition was ousted (on December 1, 2009) and replaced with one unwilling to accept an ETS in any form. Unable to pass the legislation, the Labor Government withdrew support for the CPRS, announcing that it would review the situation in 2012. During the 2010 Federal election, only the minority party, the Greens, advocated the immediate introduction of a price on carbon. Since its re-election, the now minority Labor Government appears to be favourably disposed to carbon pricing once again.

These events underscore the obvious point that politicians' awareness of and attitudes towards climate change are of tremendous significance. Yet Members of Parliament (MPs) are a hugely under-researched section of the population, with only a handful of studies revealing their thoughts on any subject matter at all. The existence of denialist views in relation to climate change science among MPs has been publicised through the media, but there has been little broader analysis. Only two Australian studies have investigated climate change views within the political domain: a 2009 study of the climate change beliefs of rural state parliamentarians' from New South Wales and Victoria (Willinck 2009) and a 2010 online survey of local, state and federal MPs' attitudes and knowledge of climate change (Hoegh-Guldberg et al 2010). State and local MPs play important roles in engaging and influencing constituent behaviour, but federal MPs determine the country's national mitigation policy framework.

This study is based on a survey that investigates federal MPs' expertise in and attitudes towards climate change, and the relationship between these. The study does not encompass specific policy areas where there are clear party lines (such as support for the CPRS), which would dictate answers. Instead it attempts to understand the attitudes

of MPs, which not only reflect but ultimately determine policy. The survey was undertaken in the second half of 2009, while the compromise CPRS was being negotiated. After analysing the results, the paper attempts to link the survey's findings with the political turmoil surrounding the CPRS.

Theoretical approach

In this study, expertise does not imply belief. One can have high expertise in climate change, but be a climate change 'denier'. Such a person is familiar with climate change science, but rejects it. This distinction between being well-versed in, and actually accepting, climate change science is useful for the analysis which follows.

Belief in climate change science is one of three positive attitudinal areas covered by this study. The other two are resolvability and political importance. Three normative attitudes are also investigated: the urgency attached to dealing with climate change, the priority attached to it relative to other long-term issues, and the extent to which Australia has a global leadership responsibility. Views on urgency and priority are combined to define MPs' concern for climate change.

Apart from measuring MPs' expertise in and attitudes on climate change, the study also investigates the relationship between the two, and among attitudes. For example, are the better informed more concerned, and do those who view climate change as politically important attach more urgency to dealing with it? The study also examines whether the characteristics of the MPs (such as party affiliation, gender, age, education, and location of electorate) have a determining role in relation to both expertise and attitude. The theoretical framework is summarised by Figure 1.

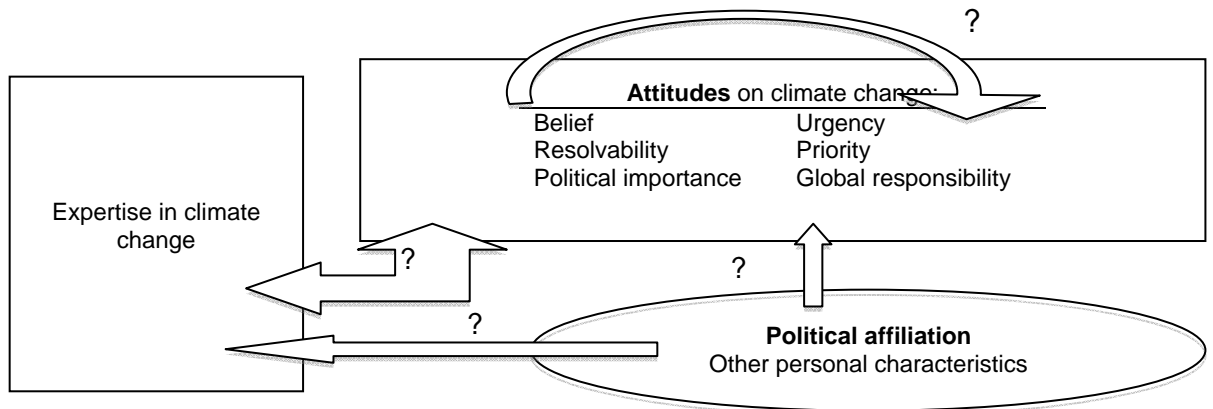


Figure 1: The theoretical framework

Within this framework four hypotheses are tested. The first is that climate change expertise is low among MPs. Less than five per cent of the current Parliamentarians have science qualifications (Parliamentary Library 2008). Most MPs rely heavily on the media to source much of their knowledge on issues of political weight (Jabobs & Shapiro 2000), but media reporting in relation to climate change is often sensationalist and emotive but inaccurate (Weingart et al. 2000). In the media, scientific uncertainties are often exaggerated in order to discredit findings—sometimes by lobby groups with vested interests (Stocking & Holstein 2009). By affording non-scientific industry-funded spokespeople and climate scientists equal exposure, the media gives equal credence to each and creates an informational bias—or a ‘balance as bias’ (Boykoff & Boykoff 2004). Therefore, MPs’ reliance on the media for climate change information would not suggest a high level of understanding.

Further, although research on politicians is scant, surveys suggest that the Australian public is knowledge-poor in relation to climate change (Bulkeley 2000). When asked ‘can you tell me what you know about climate change?’ 52 per cent of 108 households in the cities of Mandurah and Canning were either unsure or provided an incorrect response (Socialdata Australia 2007). The Youth and the Environment Survey reported that 50 per cent of its 3500-plus respondents aged between 12 and 24 incorrectly believed that climate change was caused by the hole in the ozone layer (Fielding 2009).

The second hypothesis is that expertise in climate change is not correlated with belief in or concern about climate change. Public perceptions of science-related issues often

centre on the ‘information-deficit model’ (Dickson 2005) that suggests greater knowledge of a science should lead to greater acceptance of the implications of that science, and therefore greater willingness to act. However, this model has been challenged. Discussing the results of a survey of 1218 Americans, Bord et al. (2000) state that:

Concern over possible global warming impacts may be more a function of perceived risk from environmental pollution in general than of a precise understanding of the issue... The key may be an overall concern for the environment rather than a detailed understanding of global warming. (Bord et al. 2000, p. 206)

So while some studies support the theory that ‘accurate knowledge of global warming is the strongest single predictor of behavioural intentions’ (Bord et al. 2000, p. 215), another school of thought suggests that concern for climate change and accurate understanding of the science do not go together (Norgaard 2009).

The third hypothesis is that concern for climate change is a function of belief, political importance, and resolvability. The first is obvious: belief in climate change is necessary for there to be any concern about it. Perceptions of political importance are also likely to be linked to concern. Although the threat of climate change is gradual and invisible, the power of lobby groups and the voices of constituents can make it an issue of political salience. It is postulated that an MP who feels that climate change is an issue of political weight within the electorate, or one who believes that it will have a bearing on election outcomes, will assign more urgency to action. On resolvability, those who think climate change is a soluble problem are also more likely to prioritise it. As Sudhakara Reddy and Assenza (2009) note, climate change protagonists can be classified into three groups: ‘supporters’, ‘sceptics’ and ‘realists’. The ‘realists’ do not question the existence or urgency of climate change, but are unconvinced that any proposed solutions would achieve a positive outcome. Realists are less likely to attach great importance to climate change than supporters.

The fourth and final hypothesis is that climate change knowledge and attitudes are influenced by political affiliation. From telephone interviews of 7842 Americans evenly

distributed both geographically and socio-economically, political party affiliation emerged as the ‘strongest single indicator’ of whether an individual perceives the effects of climate change (Hamilton & Keim 2009, p. 4). Two other surveys—the 2008 Gallup Poll, involving telephone interviews of more than 1000 Americans, and a survey from the Pew Research Centre of 1502 telephone interviews—both confirmed notable differences between party affiliations on all issues of climate change (Dunlap & McCright 2008; Pew Research Center 2008).

In a Newspoll survey, when 1200 Australian voters were asked: ‘do you personally believe that climate change is currently occurring?’ 15 per cent of Australian Labor Party (ALP) supporters said no, while 32 per cent of Coalition supporters said no (Newspoll 2009).

It is less clear whether other personal characteristics influence climate change attitudes. Hamilton & Keim (2009) found that other characteristics, such as level of education and gender, do not seem to have the same influence as party affiliation. The Pew Research Center concluded from its survey that 51 per cent of college graduates believed humans caused climate change, and 43 per cent of high school graduates-or-below. So level of education did not prove a very significant differentiator. Two surveys of more than 1000 Americans by the Massachusetts Institute of Technology (MIT)—one in 2003 and one in 2006—found education and gender not to be statistically significant in responses to most climate change questions (Curry et al. 2007).

Whether where an individual lives has any impact on their views of climate change is unclear. In one survey, regional location was not found to be a strong indicator of concern over climate change (Curry et al. 2007). Lorenzoni and Pidgeon (2006, p.81), however, claim that location has an impact but only through where there was a possibility of increased house insurance premiums. In Hamilton and Keim’s US study ‘the three regions showing the highest levels of concern [for climate change] represent snow-country areas’ (2009, p. 2). A study of residents of the US states of Michigan and Virginia also showed that local factors could have an important effect. If local industries are carbon-intensive, such as car manufacturing or mining, locals are less likely to be supportive of climate change policies (Shwom et al. 2008). Willinck’s study of rural

NSW and Victorian MPs concluded that ‘approximately half the politicians interviewed doubted that climate change was human-induced’ (Willinck 2009, p. 44). Hamilton and Keim (2009) provide a potential explanation for the discrepancies in these findings. They postulate that the overriding variable may be political orientation, which can also be highly localised.

Sample and survey

The research was conducted through a series of semi-structured interviews on a sample of MPs. Ministerial staff were not interviewed as responses from MPs and those of their senior aides can have significant differences (Clark et al. 2007).² A target of approximately 30 interviews was set. A systematic stratified sampling method was used. The explicit strata used were the ALP, Liberal Party (LP), National Party (Nat) and Australian Greens (AG). The two smaller parties, the Nationals and the Greens, were deliberately over-sampled. Other minor parties and independents were excluded from the sampling frame.

Implicit strata were used to enhance accuracy. Within each party, MPs were ordered by their Australian Electoral Commission (AEC) classification as rural (R), provincial (P), outer metropolitan (OM) or inner metropolitan (IM). Within each AEC classification the MPs were ordered by state.

The total population of MPs of the 42nd Parliament (without the minor parties) is 220, or about seven times 30. Therefore within the explicit strata, the lists were divided into consecutive groups of seven, starting on an MP selected randomly. To obtain a representative sample the recruitment strategy aimed to enlist one participant from each group. The sampling strategy was in part designed to reduce the impact of a high rejection rate. While several were contacted, only one MP was required from each

² One possible limitation of the Hoegh-Guldberg et al (2010) study is that staffers (rather than MPs themselves) may well have answered its on-line survey questions.

subgroup of seven as defined in the sampling strategy. A total of 132 MPs were contacted. Of these 26 were interviewed.

Some 42 either refused, generally stating ‘busy schedules’ as the primary reason, or accepted an interview only if it could be delayed for six months. Another 66 provided no response. Given the sampling strategy used, it is difficult to provide a clear-cut estimate of the rejection rate, but it is clear that it was high.

	Population	%	Sample	%
Total	220		26	
ALP	115	52	11	42
LP	87	40	10	38
Nat	13	6	3	12
AG	5	2	2	8
Senate	73	33	11	42
HoR	147	67	15	58
ACT	4	2	0	0
QLD	40	18	4	15
NSW	59	27	7	27
NT	3	1	0	0
SA	22	10	3	12
TAS	17	8	2	8
VIC	48	22	7	27
WA	27	12	3	12
Rural	39	18	5	19
Provincial	21	10	2	8
Outer Metropolitan	45	20	5	19
Inner Metropolitan	42	19	3	12
Male	153	70	18	69
Female	67	30	8	31
Under 40	33	15	4	15
40 to 50	69	31	5	19
51 to 60	89	40	13	50
Over 60	29	13	4	15
Frontbench	87	40	7	27
Other	133	60	19	73

Table1: Comparison of research sample to population

Note: Only lower house MPs are categorized using the AEC classifications (rural etc.). Other percentages add to 100. Frontbench includes Parliamentary Secretaries and Shadow Parliamentary Secretaries

The key question is whether the high rejection rate (also a feature of the Hoegh-Guldberg et al. (2010) study) leads to sample bias. Table 1 compares the features of the sample with those of the population. The sample is representative of the population on

most facets, although within the 40 to 60 age group the sample was biased towards the 51 to 60 age group. Also the recruitment strategy resulted in an under-representation of frontbenchers. This is unsurprising given how busy ministers and shadow-ministers are.

It is possible that those with strong or unorthodox views about climate change were either more or less willing to agree to participate in the survey, but unlikely. Only one MP withdrew once the anonymity clause was explained, claiming that the division of the sample by party made the results of such a survey too contentious for this MP's electorate. Nearly all those who rejected a request did so on the grounds that they were too busy. Obtaining ALP MPs was more difficult than Coalition MPs, which again is consistent with Government MPs being busier than Opposition ones. As is later noted, there is less variation in views among Government than Opposition MPs, making this under-sampling less problematic than it would otherwise have been.

In the end, a total of 26 interviewees were recruited, consisting of 11 ALP, 10 LP, 3 Nationals and 2 Greens. Weights were used to correct for over-sampling of the smaller parties, and for the fact that due to non-response ALP MPs were underrepresented. The weights applied to parties are shown in Table 2.

	Population	Target sample	Sample	Sample weights
ALP	115	16	11	1.24
LP	87	12	10	1.03
Nat	13	3	3	0.51
AG	5	2	2	0.3
Total	220	33	26	

Table 2: Sample weights by party

To avoid small sample problems, results are only presented for the Coalition Liberal National Party (L&NP), rather than for the Liberals and Nationals separately. Separate results are presented for the Greens. Even though there were only two Greens sampled, it is clear—both *a priori* and from the results—that Greens show little variability in their attitudes to climate change. In any case, the main focus is on difference between the two major parties, and only large differences are scrutinised, with testing for statistical significance.

The research was carried out from 10 September to 21 October 2009, a period that included both parliament sitting and non-sitting schedules so MPs were either in their respective electorates or in Canberra. For convenience, the interviews were designed for participation by telephone, and to be completed in less than 20 minutes. Actual interviews lasted between 10 and 40 minutes except for one, where the MP spoke for an hour and digressed significantly from the questions. The average interview duration was slightly less than 20 minutes (excluding the outlier).³

Questionnaires consisted of 20 questions divided into four sections: (1) knowledge of climate change, (2) importance of the issue, (3) views on the causes and impacts, and (4) different possible actions. Quiz-type questions testing the expertise of the respondent with regard to climate change were distributed throughout the four sections. Most questions were quantitative, but six open questions were interspersed. The questionnaire was piloted on three ministerial staff for timing and question relevance.

To avoid response or acquiescence bias, quantitative questions included a ‘not sure/don’t know’ option, and open questions were carefully worded to encompass all views. For example, when asking about what the impacts of climate change may be, the question was accompanied by the term ‘if any’.

To what extent MPs gave their own views, as opposed to what they took to be the ‘party line’ is difficult to determine. The questions were selected to elicit individual views by avoiding specific policy questions on which there were clear party lines. However, it is possible that broader attitudes also reflect party views, which, as discussed later, could change over time.

³ The interviews were facilitated by Ms Talberg’s position as an employee of the Parliamentary Library, although this research constituted no part of her duties, and the views expressed are purely those of the co-authors.

Results

This section summarises results from the survey's closed (non-qualitative) questions. All averages are calculated using the weights outlined in Table 2.

Expertise

MPs were asked questions to test their climate change expertise or knowledge. They were also asked to rate their own knowledge. All MPs rated their level of knowledge of climate change science as either 'some' or 'good', with an almost even split between the two (Table 3). The answers to the closed questions (Table 3) suggest that MPs on average overrate their knowledge of climate change. Less than five per cent of MPs were able to provide global per capita emissions levels and only 11 per cent could correctly provide figures for Australia (even allowing for a wide error margin).

When asked if they had heard of tipping points, 84 per cent answered 'yes' but only 33 per cent could provide a correct example of one. Similarly, 63 per cent said they had heard of the UNFCCC but only 30 per cent were able to spell out the full meaning of the acronym (the United Nations Framework Convention on Climate Change).

Expertise	ALP	L&NP	AG	Total
How would you rate your own knowledge of climate change science?				
Little or no knowledge	0%	0%	0%	0%
Some knowledge	64%	43%	0%	53%
Good knowledge	36%	57%	100%	47%
What is the global average per person of greenhouse gas emissions?				
Answer between 2 and 8 tonnes CO ₂ e per year	0%	9%	50%	5%
Don't know or incorrect answer	100%	91%	50%	95%
And the Australian average?				
Answer between 15 and 30 tonnes CO ₂ e per year	0%	22%	50%	11%
Don't know or incorrect answer	100%	78%	50%	89%
Have you heard of tipping points in relation to climate change?				
Yes	100%	70%	100%	86%
No	0%	30%	0%	14%
Can you give me one example of a tipping point?				
Example correct	36%	26%	100%	33%
No or incorrect example	64%	74%	0%	67%
Have you heard of the UNFCCC?				
Yes	64%	61%	100%	63%
No	36%	39%	0%	37%
Do you know what it stands for?				
Correct answer	18%	39%	100%	30%
Don't know or incorrect answer	82%	61%	0%	70%

Table 3: Expertise—results by party

An expertise index ranging from one to six was devised based on the six questions. Expertise ratings were then assigned. ‘No expertise’ corresponds to a score of 0, ‘little expertise’ to a score of 1 or 2, ‘some expertise’ to a score of 3 to 4 and ‘good expertise’ a score of 5 or 6. So, to avoid being rated as having little or no expertise, essentially an MP has to be able to answer correctly more than two out of six questions. While any assessment of knowledge must be subjective, this rating scheme does not seem harsh.

29 per cent of MPs demonstrate little or no expertise, 63 per cent have some expertise and 9 per cent demonstrate good expertise. This compares to self-rated expertise ratings of 53 per cent for some, and 47 percent for good.

The division by party, shown in Figure 2, classifies most Labor MPs as having little expertise. Coalition MPs show more variation in their levels of expertise. Average

expertise scores are almost identical at 2.2 for Labour and 2.3 for the Coalition. A Student's t-test shows that the difference in average expertise of Labor and Coalition MPs is not statistically significant.⁴

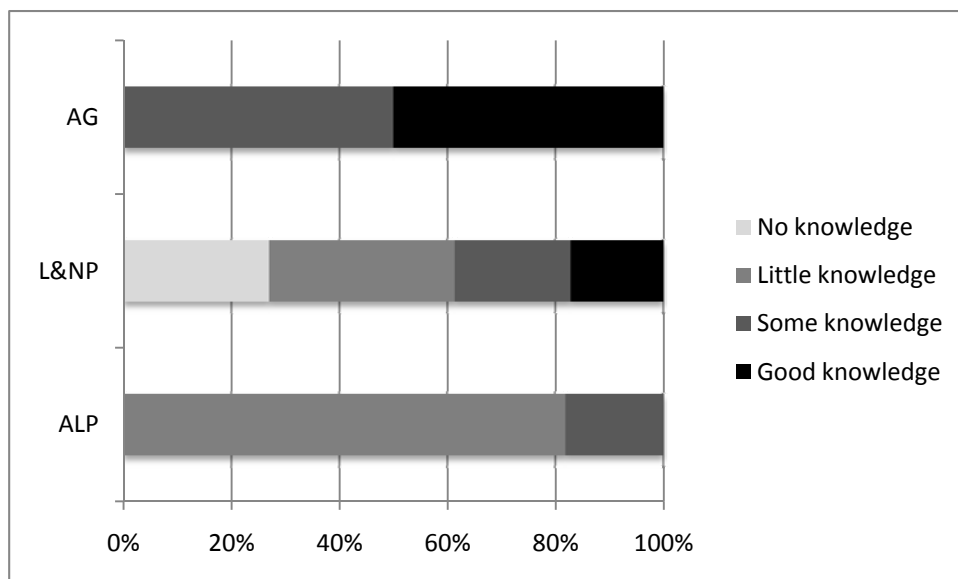


Figure 2: Expertise by party

Over 80 per cent of MPs reported as relying often on news media for information. From the list of ten possible sources provided, this is overwhelmingly the main source of information. The Internet, parliamentary committees and constituents are also significant information sources. Science journals or seminars, the Department of Climate Change, and the Parliamentary Library are of lesser informational value.

Attitudes

Beliefs

The vast majority of MPs, 96 per cent, agreed (either strongly or moderately) with the statement that climate change is occurring. 88 per cent thought it was at least partly

⁴ The p-value is 0.93. Finite population correction factors but not sampling weights were used for this and other Student's t-tests reported in the paper.

caused by human activities, and 90 per cent said that the issue was unlikely to go away by itself. The results are presented in Table 4.

Belief measures	ALP	L&NP	AG	Total
Climate change is occurring.				
Strongly agree	100%	48%	100%	76%
Moderately agree	0%	43%	0%	20%
Moderately disagree	0%	0%	0%	0%
Strongly disagree	0%	0%	0%	0%
Not sure/don't know	0%	9%	0%	4%
Climate change is caused by human activity.				
Entirely	36%	9%	0%	23%
Partly	64%	65%	100%	65%
Not at all	0%	26%	0%	12%
The climate change issue will go away by itself.*				
Likely	0%	24%	0%	10%
Unlikely	100%	76%	100%	90%

*one Coalition interviewee did not respond to this question

Table 4: Belief measures—results by party

Climate change ‘deniers’ are defined to be those who don’t agree (strongly or moderately) that climate change is occurring, don’t think it is a result (entirely or partly) of human activities, or believe the issue will likely go away by itself. Some 20 per cent fall into this category, all L&NP, as displayed in Table 5. This equates to 43 per cent of sample L&NP MPs. Not surprisingly, a Student’s t-test strongly rejects the hypothesis that there is the same proportion of deniers in both parties (the results are significant at the 1 per cent level).

	ALP	L&NP	AG	Total
Number of MPs	0	6	0	6
Percent of party	0	43%	0	20%

Table 5: Deniers by party

Resolvability

Respondents were given a series of statements and asked to answer whether each eventuality was likely or unlikely. Generally MPs are optimistic about climate change (Figure 3).

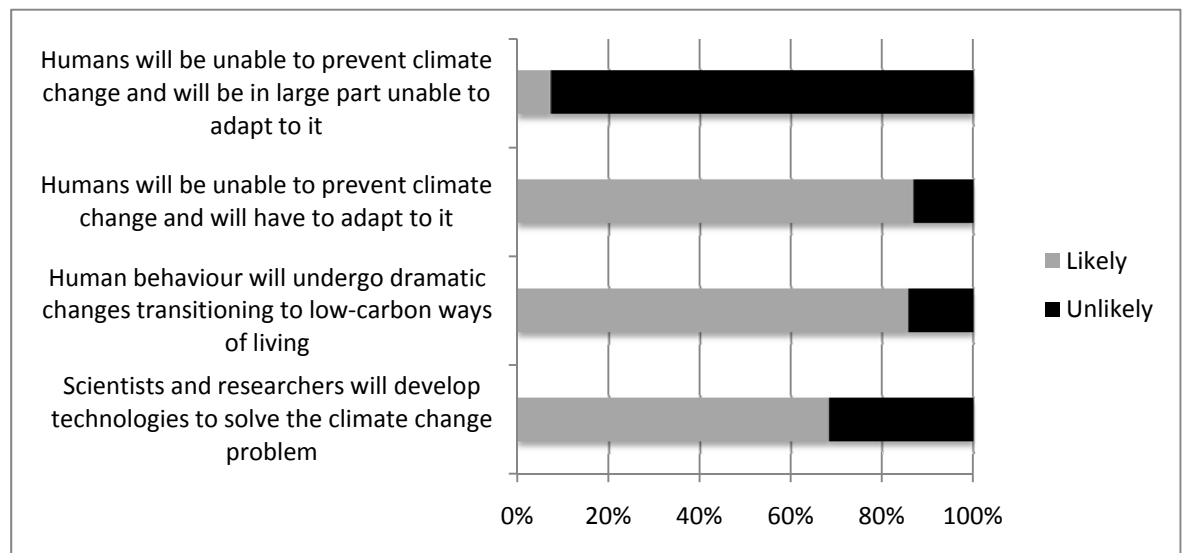


Figure 3: Resolvability views of all MPs

Analysis shows that all MPs who aren't deniers think that the problem of climate change can be solved, either through changes in human behaviour and/or through new technologies.

Political importance

On a scale of 1 to 5 where 5 is 'very important' and 1 is 'insignificant', 57 per cent of MPs rated climate change as a 4 or above in the last election. Considering the next election, 68 per cent gave the issue 4 or above in importance. In terms of importance to constituents to see government action on climate change, 53 per cent assigned a rating of 4 or above.

An index *polimp*, plotted in Figure 4, is defined as the sum of the importance of the issue in the next election (1 to 5) and the importance to constituents to see government action on climate change (1 to 5).

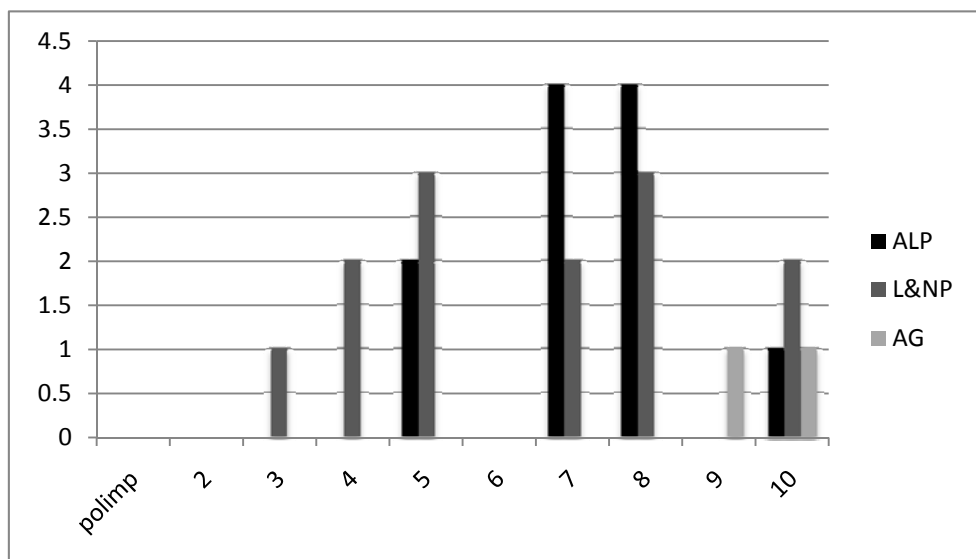


Figure 4: Unweighted frequency distribution of political importance variable ‘*polimp*’ by party

The weighted average of *polimp* is 7.3 for the ALP, 6.4 for the L&NP and 9.5 for the Greens. The ALP and L&NP averages are not statistically significantly different (the p-value is 0.30 using a Student’s t-test). This suggests the major parties have similar readings of their constituents on the political importance of the issue.

The weighted average of *polimp* for deniers is only 4.3 suggesting that climate change deniers tend to perceive climate change as being of lower political importance. This does not necessarily mean that MPs base their scientific views only on perceptions of political importance. It is more likely that those who do not believe that climate change is a problem do not prioritise it for that reason, and are more likely to think that their constituents and the broader electorate share their views. They therefore do not rate the political importance of climate change highly.

Concern: urgency and priority

A majority of MPs believe climate change is an issue for which it is necessary to take major steps very soon (64 per cent), a third believe that modest steps should be taken in coming years (32 per cent) and just four per cent don’t believe that any steps need to be taken.

The L&NP MPs attributes significantly less urgency to the issue of climate change (Figure 5), with the clear majority (almost 70 per cent) thinking that it is only necessary to take modest steps in the coming years. By contrast, Green and ALP MPs are unanimous that it is necessary to take major steps very soon. The difference in mean urgency attached to climate change between the ALP and the L&NP is significant at the 1 per cent level using a Student's t-test.

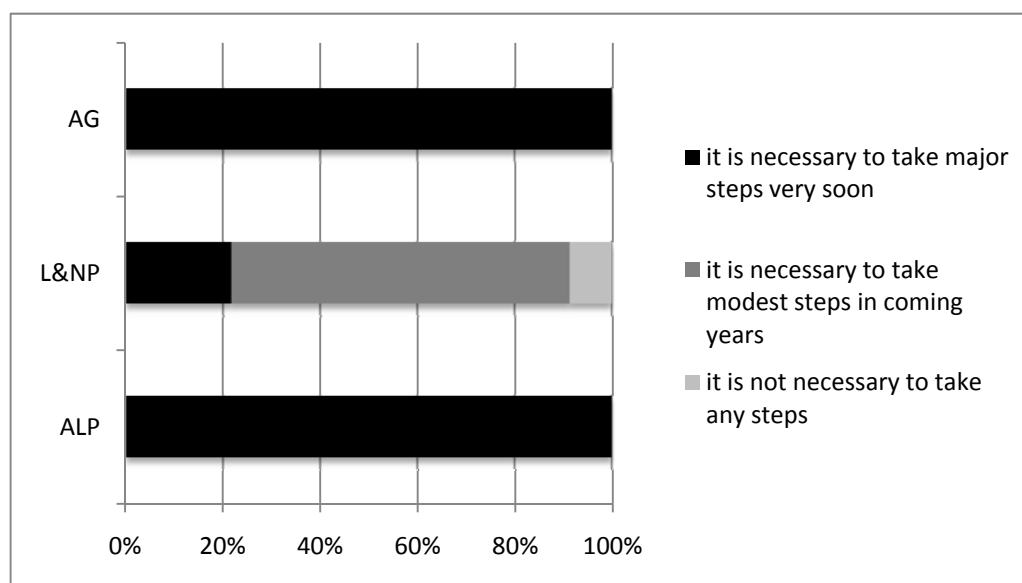


Figure 5: Urgency of action on climate change by party

To examine the priority that MPs give to climate change relative to other issues, respondents were asked to rate the importance of four long-term challenges on a 1-to-5 scale. Figure 6 shows the average score for the four different challenges by party. Water resource management is considered the long-term challenge of most importance (with an average score of 4.3), an aging population the second (average score of 3.8), climate change the third (average score 3.6), and defence the fourth (average score 3.3). Again there are significant party differences. On average, ALP MPs rate climate change the top most important issue with water management, in front of aging and defence. L&NP MPs by contrast rate climate change on average as the least important challenge, well below water, aging and defence.

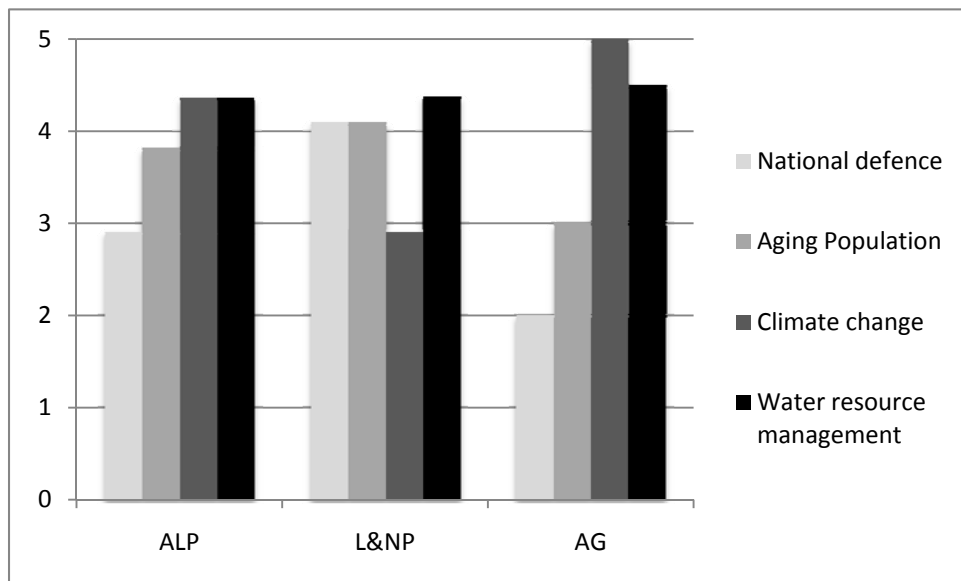


Figure 6: Average importance rating of long-term challenges by party

The results for urgency and priority are combined to classify MPs on a scale of 1 to 3 for their concern for climate change. A rating of 3 (high concern) is assigned to MPs who believe climate change is an urgent issue for which it is necessary to take major steps very soon (Figure 5) and who rate climate change as a top-priority long-term issue, assigning it a score no less than that of any of the other three long-term issues (Figure 6). MPs rated 2 show medium concern. They believe climate change is an urgent issue for which major steps should be taken very soon, but they do not rate climate change as a top-priority long-term issue. A rating of 1 (low concern) is given for those who do not believe climate change is an issue for which it necessary to take major steps very soon.

As illustrated in Figure 7 a strong majority (78 per cent) of L&NP MPs have low concern for climate change, whereas both Green MPs demonstrate high levels of concern. Labor MPs are in between, with 27 per cent showing medium concern and 73 per cent high concern.

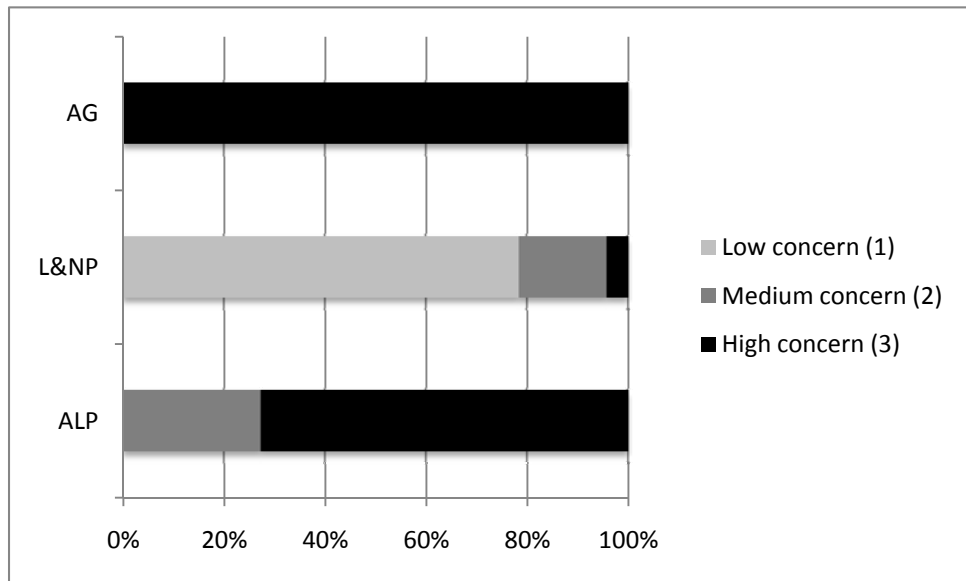


Figure 7: Concern for climate change of MPs by party

Global responsibility

A clear divide is apparent within the sample of MPs with regard to whether Australia should be a leader in climate change action (Figure 8). All Labor and Green MPs strongly agree that globally Australia should play a leadership role on climate change. Only 18 per cent of the L&NP MPs strongly or even moderately agree with this view..

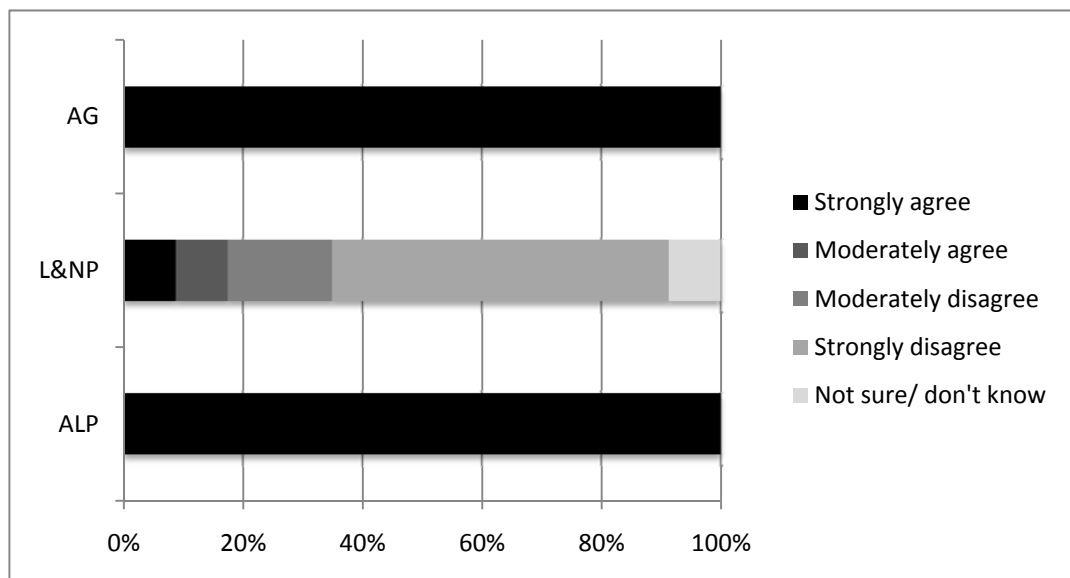


Figure 8: Global responsibility: views of MPs by party regarding the statement that Australia should be a leader in climate change action

Expertise, beliefs and concern

Table 6, below, shows that the deniers are among the lowest as well as the highest scoring for expertise. There is no correlation between expertise and belief.

	Deniers	Believers	Total
Expertise index			
None or low (0-2)	4	13	17
Some (3-4)	1	5	6
Good (5-6)	1	2	3
Total	6	20	26

Table 6: Expertise against belief (unweighted)

Similarly, Table 7 shows that level of concern (measured by the concern variable from 1 to 3) has no link with expertise. Those with greater expertise do not necessarily demonstrate greater concern.

	High concern	Medium concern	Low concern	Total
Expertise index				
None or low (0-2)	7	3	7	17
Some (3-4)	2	1	3	6
Good (5-6)	1	1	1	3
Total	10	5	11	26

Table 7: Expertise against concern (unweighted)

Influences of personal characteristics

Spearman rank correlations are used to investigate relationships between personal characteristics (party, gender, age, education, state, and urban-rural location) and each of the variables for concern, belief, resolvability, political importance and global responsibility (whether Australia should take a leadership role).

Variables	Rural/met	Gender	Age	Education	Party	QLD	NSW	SA	Tas	VIC	WA
Belief	0.16	0.17	-0.18	0.25	0.55*	-0.02	-0.08	-0.09	0.16	0.13	-0.09
Concern	0.18^	0.34	-0.14	0.24	0.81*	-0.14	-0.02	0.12	0.31	-0.22	0.12
Resolvability	-0.18	-0.20	-0.16	0.14	-0.01	-0.03	-0.36	0.08	-0.02	0.35	-0.02
Perception of political importance	0.025	0.23	-0.14	-0.08	0.27	0.09	-0.09	-0.08	0.07	-0.04	0.11
Global responsibility	0.33	0.42*	-0.16	0.35	0.89*	-0.06	-0.18	0.16	0.26	-0.09	0.07

*correlation coefficient significant at the 5 per cent level or lower.

Table 8: Spearman rank correlation coefficients of personal characteristics to concern and attitudes

The variable rural/met refers to the four AEC classifications used in the sample stratification strategy (Table 1). Rural seats are assigned a value of 1, provincial 2, outer metropolitan 3, and inner metropolitan 4. Senators are not assigned a value for rural/met so the correlation is run separately just for lower house MPs. The six states and territories are run as dummy variables where a 1 means the MP's electorate is within that state. Indices for belief (Table 5), concern (Figure 7), and perception of political importance (polimp, Figure 4) are those introduced earlier in the text. The resolvability index ranges from 0 to 2 and is defined in relation to two of the questions concerning resolvability (Figure 3)—the one regarding a technological solution and the other on transitioning to low-carbon living—where an answer of unlikely was given in each case the value 0 and likely was assigned 1. For global responsibility, the index measures agreement (whether strong or moderate) with the statement that Australia should take a leadership role (Figure 8).

Apart from correlations involving party affiliation, discussed earlier, only the correlation between gender and leadership is found to be significant. Female MPs are more likely to believe Australia should take a leadership role, globally. In fact 87.5 per cent of female MPs interviewed (7 out of 8) strongly agreed with this statement, whereas only 39 per cent of the males felt the same way. This probably reflects the fact that there is a higher ratio of women within the sample (and actual population) of Greens and ALP than Coalition (Table 9). Within the 42nd Parliament, 36 per cent of ALP MPs are female, whereas female Liberal and National MPs form only 26 and 15 per cent of their parties, respectively. MPs from urban seats are more likely to show a higher concern for climate change, but the relationship is not statistically significant.

	Male	Female
ALP	5	6
AG	1	1
L&NP	12	1

Table 9: Gender distribution of sample within parties

Determinants of climate change concern

It was hypothesised that belief in climate change science, the perception that climate change is politically important, and the view that climate change is resolvable will all contribute to an MP having a high concern for climate change action. It was also hypothesised that political affiliation would be a determinant of climate change attitudes. These hypotheses are tested through the use of regression analysis. The ‘1 to 3’ concern classification is employed as the dependent variable. The previously introduced dummy variable for belief and index of political importance are used as independent variables. Resolvability is not included in the analysis since, as discussed earlier, all MPs who believe in climate change science see it as resolvable. On the basis of the results from the correlation analysis presented earlier (Table 8), among personal characteristics only the party variable is included in the regression analysis. Here, party is represented by a dummy variable equal to 1 for ALP or Green and 0 for the L&NP. Table 1 presents a summary of the variables.

Variables	Number of observations	Mean	Standard deviation	Min	Max
Concern	26	1.96	0.92	1	3
Belief	26	0.77	0.43	0	1
<i>Polimp</i>	26	7.04	2.01	3	10
Party (AG/ALP=0, LP/Nat=1)	26	0.5	0.51	0	1

Table 10: Summary of variables for regression analysis

Since the dependent variable for concern is ordinal, and there is more than one category, an ordered logistic regression (OLR) analysis is used. However, the model did not achieve convergence. It is suggested that this is because of quasi-complete separation that occurs because values of the urgency variable overlap at one value of the belief variable. That is, all the deniers are included in the ‘1’ category for concern. Allison (2008) discusses how this type of problem often leads to non-convergence of logistic

regressions. Clearly, all the climate change deniers have low concern for climate change, since they do not view it as a genuine problem. To circumvent the problem, the belief variable is interacted with the *polimp* variable to create an index that is 0 for deniers, and the value of the *polimp* for everyone else. This restriction is consistent with the survey data, which shows that all deniers are in the lowest category of concern for climate change. It also allows both variables (*polimp* and *belief*) to be included in the regression. We therefore estimate the equation

$$\begin{aligned}\text{Logit}(C_j) &= \log(C_j/(1-C_j)) \\ &= a_j - b(\text{polimp} * \text{belief}) - c(\text{party})\end{aligned}\quad (1)$$

where C_j is the probability that the an MP is in the j th or lower concern category, and $j=1$ or 2 .

A chi-squared of 26.6 for 2 degrees of freedom resulted suggesting that the null hypothesis of an invalid model could be rejected at a confidence level of more than 99.9 per cent. The results, presented in Table 11, show that the greater the political importance a non-denying MP attaches to climate change, the greater the likelihood he or she is of being in a higher concern category. They also show that, as we move from Coalition to Labor, the likelihood of being in a higher concern category increases. Both variables were statistically significant to the 10 per cent or lower level. The party variable is significant at the 1 per cent level and has a greater impact. The results can be interpreted using odds ratios (calculated as the exponent of the coefficients in Table 9), which measure the relative odds of being in a higher concern category for different groups. An ALP MP is 61 times more likely than a Coalition MP to show more concern, whereas a believing MP is 1.7 times more likely to show more concern if his or her score for political importance increases by one unit.

Variables	Coefficients	Standard error
<i>Polimp*belief</i>	0.5	0.3
Party	4.12	1.33
Constant (a_1)	4.29	2.46
Constant (a_2)	6.54	2.69

Table 11: OLR analysis results for concern using the *polimp*belief* variable and party

Discussion

Beliefs regarding, and the priority attached to, climate change are broadly in line with public opinion in Australia. Of the sample MPs, 96 per cent believe that climate change is occurring, which is in line with 84 per cent of Australians (Newspoll 2008). A majority of 88 per cent of sample MPs believe that humans are at least partly to blame for climate change, as compared to 94 per cent of the public (Newspoll 2008). Most interviewed MPs, 64 per cent, deem that major steps are needed very soon which compares to 70 per cent of Australians (WorldPublicOpinion.org 2007).

The first hypothesis related to the level of MPs' expertise, which was predicted to be low based on surveys of the public. Sample MPs self-assessed their knowledge as moderate to good but predominantly displayed low to moderate expertise using the index developed in the paper. While any index will be subjective, the index developed in this paper is based on simple questions and can hardly be accused of setting the bar too high. As noted earlier, other surveys have also found that the expertise of Australians in relation to climate change is low (Bulkeley 2000; Socialdata Australia 2007; Fielding 2009). An analysis of the information sources used shows that 83 per cent of sample MPs rely on news media for their information on climate change. The literature suggests that reliance on the media is unlikely to lead to a high level of expertise (Stocking & Holstein 2009; Boykoff & Boykoff 2007).

The second hypothesis investigated the relationship between expertise on one side and climate change belief and concern on the other. Cross-tabulations for belief and concern against expertise show no relationship. Deniers are just as well-informed as believers, and it does not seem to hold that the highly-concerned endeavour to become more

knowledgeable. This is consistent with the conclusions drawn by Bulkeley (2000) that the information-deficit model can be challenged in relation to climate change.

The third hypothesis suggested that concern towards climate change was driven by beliefs in climate change, and perceptions of political importance and resolvability. Resolvability was ruled out as a determining factor, since it is an attitude held in common by all climate change believers. Through regression analysis it emerged that the other two factors are of relevance.

The fourth hypothesis was that political affiliation was an important determinant of climate change expertise and attitudes. No clear link emerges between expertise and political affiliation, but political affiliation is a clear driver of climate change attitudes. The survey confirms the result, already publicised by the media, that some L&NP MPs openly state a lack of belief in climate change science (Kitney 2009; Madigan 2008). Both Willnick (2009) in a study of NSW rural MPs, and Hoegh-Guldberg et al. (2010) in an online survey of politicians find significant levels of climate change denial among this group of politicians. While 100 per cent of Greens and Labor MPs believe the science of climate change, 45 per cent of Coalition MPs do not.

The survey also highlights differences across party lines in the priority attached to climate change. This emerges from the regression analysis, but is also evident from inspection of Figure 5. All surveyed Labor and Green MPs regard climate change to be an urgent issue requiring immediate action; they can be viewed as siding with Stern and Garnaut in the climate debate (Stern 2006; Garnaut 2008). However, 70 per cent of surveyed L&NP MPs regard climate change to be a non-urgent issue, requiring only modest steps; they can be viewed as siding with economists such as Nordhaus (2008) who argue for a gradual response to climate change.

Likewise, ALP MPs on average rate climate change as a long-term issue of high importance. The two Greens surveyed give climate change an even higher importance rating. But L&NP MPs on average rate climate change as the least important of four long-term issues, below water management, the aging population and defence. Finally, all surveyed Labor MPs think that Australia should lead globally on climate change, but only 18 per cent of L&NP MPs do.

These different outlooks across parties do not arise from differences in the perceived political importance of climate change. Such perceptions matter at the individual level in determining the level of concern each MP attaches to climate change, but on average the parties share the same political reading of the political importance of climate change.

The differing attitudes across parties are only in part a product of the greater prevalence of climate change denial among L&NP ranks. If ‘denier’ MPs are excluded from the analysis, some of the stark differences in outlook disappear, but by no means all (Table 12).

	ALP	L&NP	L&NP- deniers excluded
Urgency—it is necessary to take major steps very soon	100%	27%	38%
Importance—climate change is a long-term challenge of importance rated 4 or 5 (out of 5)	82%	45%	82%
Global responsibility—agree that Australia should be a leader in climate change action	100%	18%	31%

Table 12: Comparison of views of ALP and Coalition with deniers included and excluded

It is interesting to examine to what extent these results can explain the abandonment in late 2009 and early 2010 of support for Australia’s proposed emissions trading scheme (ETS), the Carbon Pollution Reduction Scheme (CPRS). Why, given the attitudes of most of its MPs, did the L&NP ever support an ETS, and why did the ALP stop doing so?

Consider first the L&NP. The survey reveals that the great majority of Coalition MPs do support action on climate change but only ‘modest actions in the coming years’ rather than ‘major action very soon’ (Figure 5). Overall, the survey results suggest that L&NP support for the CPRS was fragile and shallow at best. Timing was also important. Very few L&NP MPs see the need for Australia to take a global leadership role on the issue. Although the Liberal party went into the 2007 election supporting an ETS, the results of the survey suggest that in the months prior to the important December 2009 Copenhagen Conference, a number of L&NP MPs would have viewed supporting the CPRS *at that time* as moving too far ahead of the rest of the world. Even for those who were not opposed to a CPRS when the time was right were unlikely to be persuaded that

the time was right in November/December 2009. Not surprisingly, when party support for CPRS was put to the test, it did not survive.

Consider now the ALP MPs. Given their high level of concern, how could the ALP have abandoned the CPRS? One obvious explanation is that it was a decision of the leadership rather than of the party-room. It is also possible that the survey overstates the commitment of ALP MP to act on climate change. Perhaps MPs were responding to these survey questions with what they perceived to be the party line. Another possible explanation is that one important variable had changed, namely, the perception of the political importance of climate change. After its rejection of the CPRS, the L&NP began to portray it as a 'big tax on everything' (Abetz 2010, p.303). In this context, ALP MPs may have come to view action on climate change as a political risk (despite opinion polls continuing to show public support for such action) and therefore less important politically. In line with the regression results of Table 11 this would have weakened Labor support for strong action.

After the 2010 election, the returned Labor Government announced that it would once again support a carbon price (though not necessarily the CPRS). This was needed to gain support from a number of independent and Green MPs who came to hold the balance of power. It also seems consistent with the underlying views of Labor MPs as identified in this survey.

Conclusions

Although some findings are unsurprising, many of the survey results could not have been predicted—particularly the large and widespread differences in underlying attitudes towards climate change attitudes across party lines.

Casual observation reveals a much greater cross-party consensus on climate change in Europe than in either the United States or Australia. The May 2010 Conservative take-over of power in the UK, for example, is expected to make a big difference in economic policy, but not with regard to climate change. Why such a consensus has developed in some countries but not in others, and not in Australia, is a worthy subject for future research.

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Appendices

Appendix A—Questions

1. How would you rate your own knowledge of climate change science? Would you say you have ‘little or no knowledge’, ‘some knowledge’ or ‘good knowledge’?
2. Can you tell me, briefly, in your own words, what you understand by the term ‘climate change’?
3. I will now read you a list of ten information sources, after each, please let me know whether you use it ‘never’, ‘sometimes’ or ‘often’ for information on climate change:
 - News media, such radio, television and newspapers
 - Science journals
 - Publications from think tanks
 - Parliamentary Committees
 - The Internet
 - Your staff
 - The Parliamentary Library
 - The Department of Climate Change
 - Your constituents
 - Science seminars
4. On a scale of 1 to 5 where ‘5’ is ‘very important’ and 1 is ‘insignificant’, how would you rate the importance of the climate change issue in the last election? And how do you think it will rate in the next election?
5. Community attitudes to climate change vary across Australia. On a scale of 1 to 5, how important is it to your constituency to see Government action on climate change?
6. Climate change is a long-term challenge. On a scale of 1 to 5, how would you rate the importance the following long-term challenges? National defence, ageing population, climate change, water resource management.
7. In your view, climate change is an issue for which:
 - it is necessary to take major steps very soon
 - it is necessary to take modest steps in coming years
 - it is not necessary to take any steps

8. How strongly do you agree with the statement that climate change is occurring?
Do you strongly agree, moderately agree, moderately disagree, strongly disagree, not sure/don't know?
9. Do you personally believe that climate change is entirely caused by human activity? Partly caused by human activity or not caused by human activity?
10. In your view, what sort of *human activities/other causes*, if any, lead to climate change?
11. As far as you are aware, does the hole in the ozone layer contribute to climate change?
12. What is the global average per person of greenhouse gas emissions? And the Australian average?
13. What do you believe are or will be the primary impacts of climate change in Australia, if any?
14. Have you heard of tipping points in relation to climate change? Can you give me one example of a tipping point?
15. Can you tell me which ones you think they are likely to eventuate or not?
 - Scientists and researchers will develop technologies to solve the climate change problem
 - Human behaviour will undergo dramatic changes transitioning to low-carbon ways of living
 - Humans will be unable to prevent climate change and will have to adapt to it
 - Humans will be unable to prevent climate change and will be in large part unable to adapt to it
 - The climate change issue will go away by itself
16. In terms of policy response, which do you see as more important: mitigation, adaptation, or are they of equal importance?
17. What do you believe are the most important international barriers to effective climate change mitigation? What about domestic barriers?
18. Have you heard of the UNFCCC? (if not go to next question and include explanation). Do you know what it stands for?
19. *The UNFCCC is...*
Please tell me whether you strongly agree, moderately agree, moderately disagree, strongly disagree, not sure/don't know

- Australia should help developing countries adapt to climate change.
- Australia should help developing countries transition to a low-carbon economy
- Australia should be a leader in climate change action
- Australia should participate in global climate agreements such as those under the UNFCCC
- Australia should have its own agenda on climate change and not be driven by international agreements

Do you have any other comments?