INSTITUT DE L'ÉNERGIE TROTTIER

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FEELING THE HEAT? THE PARADOX OF PUBLIC OPINION AND CLIMATE CHANGE POLICY IN CANADA:

TOWARD A NEW RESEARCH AGENDA

December 2015

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INSTITUT DE L'ÉNERGIE TROTTIER

The mission of the Institut de l'énergie Trottier is to train a new generation of engineers, scientists and innovators who have a systemic understanding of the issues surrounding the future of energy and of the technologies available to tackle the challenges society will face in the coming decades. The Institute promotes the search for sustainable solutions to help secure the future of energy in Québec, Canada and the world, as well as awareness-raising and public information about these issues.

The authors would like to thank Louise Millette (Polytechnique Montréal), Jean-François Desgroseilliers (Polytechnique Montréal) and Jean-Patrick Toussaint (David Suzuki Foundation) for their helpful comments on an earlier draft.

We also acknowledge financial support from l'Institut de l'énergie Trottier, Polytechnique Montréal and the Chaire d'études politiques et économiques américaines, CÉRIUM, Université de Montréal.

ISBN pdf: 978-2-924597-06-4 // ISBN print: 978-2-924597-05-7

SUMMARY

Drawing on original survey data, this report sheds new light on the complexity of Canadians' attitudes around climate change. Although the vast majority perceive evidence of global warming, substantially fewer believe humans are primarily responsible for the observed rise in temperature. Moreover, though a majority believe climate change will harm Canadians at some point within the next decade, few perceive themselves to be personally at risk. In fact, very few Canadians are well informed about climate change, and most lack even a general understanding of climate policy. Canadians are unwilling to pay substantial amounts to produce more renewable energy. These findings help explain why Canadian governments—especially the federal government—have shown relatively little interest in implementing ambitious climate policy. They also suggest that if the Trudeau government is to change this course, it will need to clearly communicate the benefits of its climate policy to Canadians. Further research is thus necessary to identify which strategies are most likely to be effective when discussing climate change with different audiences. This includes both research on and the diffusion of information about risks for Canadians and policies that transition Canada to a decarbonized economy. Such a shift, if it is to occur, will allow for a more in-depth analysis of the complex relationship between climate policy and public perceptions of climate change in Canada.

Key Findings

1. Although most Canadians are aware that the climate is changing, substantially fewer attribute this warming primarily to human activity.
2. Most Canadians perceive climate change to be happening, yet few perceive themselves as personally at risk.
3. Despite the urgency of the problem, the climate change issue in Canada currently lacks saliency.
4. Though some provinces have taken action, Canadians remain uninformed about climate policy.
5. Canadians are generally unwilling to pay large sums to support increased production of decarbonized energy, though this willingness increases with adherence to the scientific consensus on global climate change.

INTRODUCTION

The popular press often suggests there is a consensus on climate change in Canada (CBC News 2015a; CBC News 2015b). On this reading, public opinion is ahead of policy-makers who, for decades, have largely failed to implement ambitious climate policy at the federal level. There is certainly some merit to this popular view. Polls consistently find that strong and stable majorities of the Canadian population believe the average global temperature on earth is rising (Martel-Morin et al. 2015; Lachapelle et al. 2014), perceive the science around climate change as conclusive (Environics 2015) and support stricter climate policies, including carbon taxes (Angus Reid Institute 2014; 2015; Anderson and Coletto 2014; Rudny 2015). Yet Canada's record on climate policy after ratifying the Kyoto Protocol in 2002 has been dismal (Office of the Auditor General of Canada 2012; 2014). This broad assertion applies to both Liberal and Conservative governments, which have largely failed to implement effective climate policies to support the ambitious greenhouse gas (GHG) reduction commitments agreed to by successive Canadian governments at the international level. Though some expect Canadian climate policy changes with the advent of the new Liberal government in 2015, just how motivated the Trudeau administration is to act on climate issues remains to be seen. Indeed, climate change was barely an issue in the 2015 election campaign; the economy, the niqab and Canadian values dominated headlines. If change in Canadian climate policy is on the short-term horizon, it is likely not the result of mounting public pressure. This situation poses important questions concerning the current salience of the climate change issue in Canada, as well as the relationship between public opinion and climate policy, which now appears more complex than originally thought.

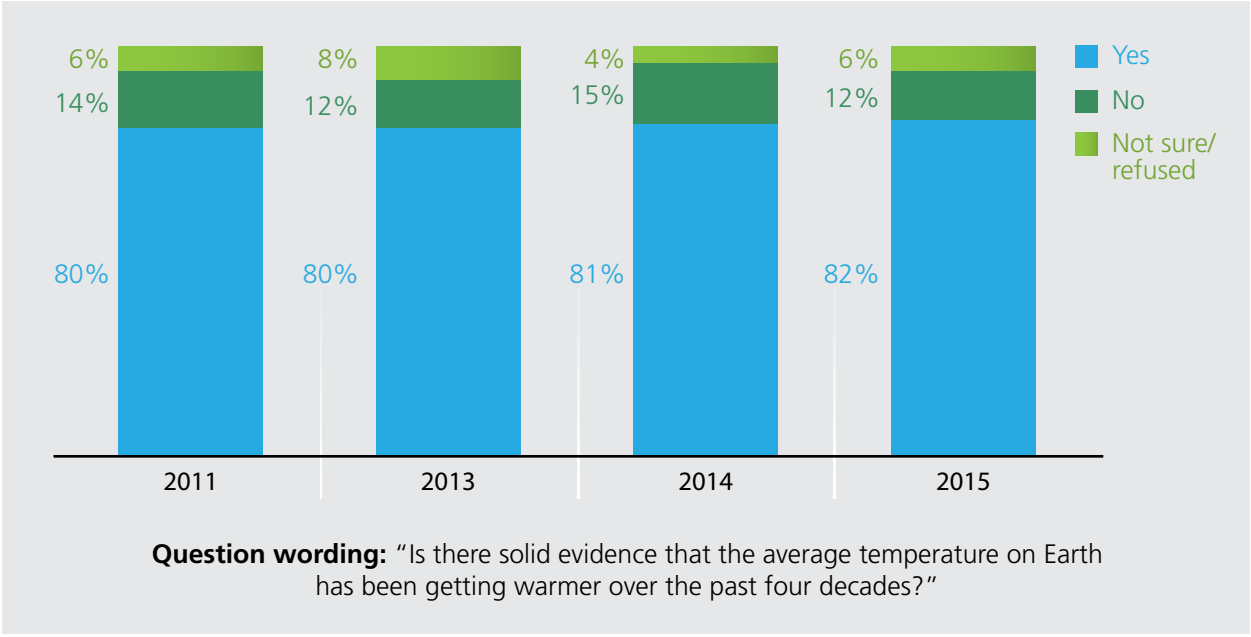
The objective of this report is to take stock of the state of Canadian public opinion on climate change in the fall of 2015. During this period, government leaders will be preparing for the climate talks to be held in Paris for the COP21, a critical juncture in global climate policy that will likely influence future policy decisions in Canada and around the world. Analysing data from the latest wave of the *Canadian Survey on Energy and Environment* (CSEE, formally the *National Survey of Canadian Public Opinion on Climate Change*), this report identifies areas of agreement, but perhaps more importantly, areas of disagreement in Canadian attitudes toward this crucial issue. Specifically, we identify five key reasons why politicians do not appear to be feeling public heat about climate change. These include: 1) ambiguity about the key tenets of the scientific consensus on climate change; 2) perceived invulnerability toward climate change risks; 3) the small number of Canadians mobilized on this issue; 4) ambiguity around key climate policies; and 5) limited willingness to pay for less carbon-intensive forms of energy.

After reviewing each of these key findings, we identify implications for policymakers. Specifically, we suggest that in light of a relatively disengaged public, policy makers intent on implementing ambitious climate policy will need to play a more active role in communicating the various benefits of moving toward a more decarbonized economy. More research is therefore required to better understand the different segments of the Canadian public, and the messages that are most likely to resonate with their values. Moving forward, changes in markets and economic structure will create both challenges and opportunities for Canadian climate policy design, implementation and resilience, providing further opportunities for research on the interaction among public opinion, the external environment, and policy change.

1

ALTHOUGH MOST CANADIANS ARE AWARE THAT THE CLIMATE IS CHANGING, SUBSTANTIALLY FEWER ATTRIBUTE THIS WARMING PRIMARILY TO HUMAN ACTIVITY

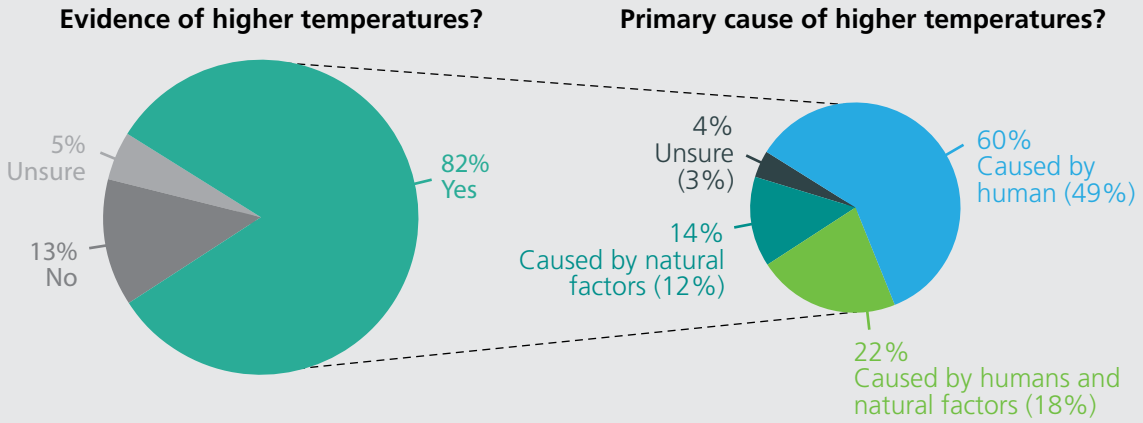
The consensus of an overwhelming majority of climate scientists that the climate-warming trends of the last several decades are very likely due to human activity has been widely publicized (Anderegg et al. 2010; Cook et al. 2013). Indeed, the best available scientific research provides clear evidence that mean global surface temperatures have been increasing on Earth since the mid 20th century (IPCC 2014). Opinions in Canada partly converge with this scientific view, notably on whether Canadians perceive "solid evidence" of warming global temperatures. This specific question measures the extent to which an individual's perceptions line up with one element of the growing scientific consensus on climate change; namely, whether or not mean global surface temperatures on Earth are actually rising. Results are presented in Figure 1.



Question wording: "Is there solid evidence that the average temperature on Earth has been getting warmer over the past four decades?"

Figure 1: Perceptions of a warming trend

As depicted in Figure 1, a strong majority of Canadians perceive that the average temperature on Earth has been rising over the past four decades. In the fall of 2015, for instance, four out of five Canadians perceived solid evidence of global warming. In contrast, the proportion of those who perceive no evidence of a warming trend is comparatively smaller (about one in ten). Remarkably, these perceptions have remained constant since 2011, a stability that contrasts sharply with opinion trends observed in other parts of the world, notably in the U.S., where opinions have shifted much more over time (Borick et al. 2015; Lachapelle et al. 2015).



Question wording: "Is there solid evidence that the average temperature on Earth has been getting warmer over the past four decades?" AND "Is the Earth getting warmer because of human activity, such as burning fossil fuels, or mostly because of natural patterns in the Earth's environment?"
Note: Population percentages in parentheses.

Figure 2: Adherence to the scientific consensus on climate change

Though substantial, it would be an error to infer from these findings alone that there is consensus on climate change in Canadian public opinion. Indeed, perceptions of a warming trend correspond to only one dimension of the scientific consensus on climate change. While four out of five Canadians perceive solid evidence of a warming planet, attributing such warming to human causes is quite another matter altogether. This is shown in Figure 2, which presents the distribution of respondents on both dimensions of the prevailing scientific consensus on climate change: whether it is real and whether it is caused by human activity. The pie chart to the left summarizes responses to the question on the solid evidence of global warming. The pie chart to the right breaks down the respondents who answered "yes, there is solid evidence" who were subsequently asked to name the primary cause of such warming. Because only those who first answered affirmatively were subsequently asked about the causes of the warming they perceived, we provide the distribution of responses to the causal question expressed as a percentage of climate-change believers (out of parentheses) and those expressed as a percentage of the total population (in parentheses). So, for instance, of the 82% who answered "yes, there is solid evidence of a global warming trend," 60% attributed this warming primarily to human activity, which works out to 49% of the entire sample. About 22% of believers voluntarily responded "both human and natural factors," bringing the percentage of Canadians who attribute at least some part of global warming to human activity to 67%. However, this attitude does not reflect strong convictions on humans' primary role. Thus, while half of Canadians adheres to the scientific consensus on climate change, the other half is sceptical about climate change to some extent. This is an important nuance, since it is difficult to see why people would be willing to accept costly mitigation policy, which implies changes in their behaviour, if they do not perceive human activity as the problem's primary cause or if they deny a warming phenomenon altogether.

1

Given the importance of acknowledging humans' role in rising global temperatures in changing individual behaviour, decision makers must understand what helps Canadians adhere to the scientific consensus on climate change. To this end, we explored the relationship between people's views on climate change (whether it is real and caused by human activity) and the extent to which they trust scientists as a source of information on this issue (Table 1). Logically, we would expect that the more individuals trust scientists as a source of information, the more likely they are to adhere to the prevailing scientific consensus on anthropogenic climate change.

Table 1: Adherence to climate change consensus by trust in scientists

	Strongly distrust (4%)	**Somewhat distrust** (10%)	**Somewhat trust** (47%)	**Strongly trust** (38%)	**Row Total**
No evidence/not primarily caused by humans	78%	82%	57%	31%	50%
Yes, evidence and primarily caused by humans	22%	18%	43%	69%	50%

Question wording: "How much do you trust or distrust scientists as a source of information about global warming?"
Note: $x^2 = 116.43$; $df = 980$; $p = 0.0000$

Table 1 explores the relationship between trust in scientists and views on global warming via a bivariate frequency distribution. For simplicity, the 24 cases where respondents were unsure of their answer were omitted from this analysis. Those respondents who were unsure of whether the planet is warming or who were unsure of the primary cause of warming are included in the category "No evidence/not primarily human caused." As shown in Table 1, there appears to be a relationship between views on anthropogenic climate change and level of trust in scientists. In fact, the more strongly people trust scientists as a credible source of climate change information, the more likely they adhere to the scientific consensus on climate change. Conversely, the more strongly people distrust scientists as a source of information, the less likely their views correspond with the prevailing scientific consensus on anthropogenic climate change. Trusting scientists as a source of information on climate change does not necessarily imply that Canadians are knowledgeable about the science. In fact, some Canadians who say they strongly or somewhat trust scientists nevertheless have opinions that are inconsistent with the prevailing scientific view. For these non-trivial segments of the Canadian population, science communication may play an important role in potentially shifting opinion to be more in line with the scientific consensus.

2

MOST CANADIANS PERCEIVE CLIMATE CHANGE TO BE HAPPENING, YET FEW PERCEIVE THEMSELVES AS PERSONALLY AT RISK

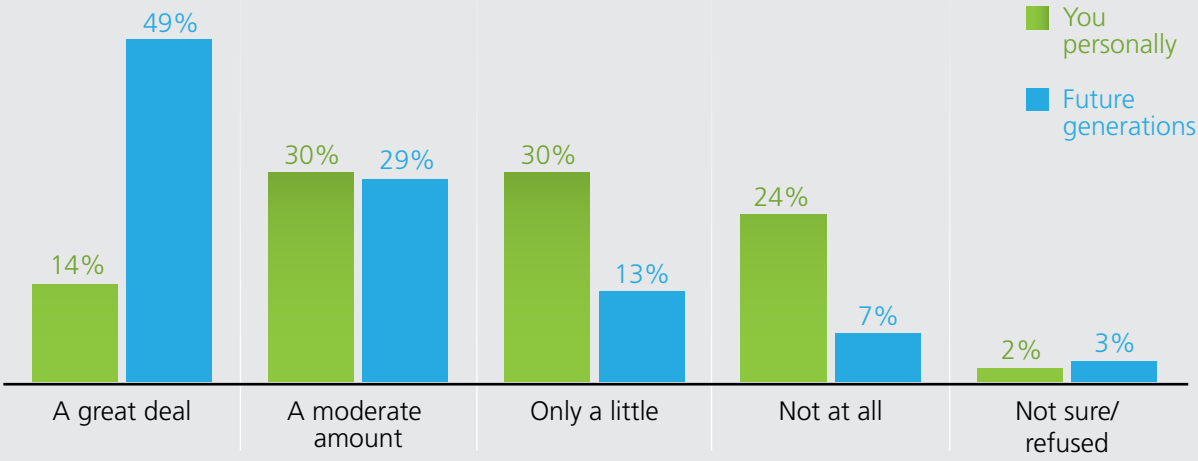
Climate science suggests global emissions will need to peak in the next few decades before sharply declining if the world is to avoid "dangerous" changes in the Earth's climate (Smith et al. 2009; IPCC 2014). Following the definition provided by the United Nations Framework Convention on Climate Change, dangerous climate change constitutes levels that would surpass the adaptive capacity of ecosystems, endanger food production and/or impede economic development (UN 1992). Major international organizations have also begun to link rising temperatures to more extreme weather events (WMO 2015). It would appear that such messages are having an effect (Table 2).

Table 2: Perceived risk and timing of harm in Canada

	Already (45%)	**In 10 y** (14%)	**In 25 y** (15%)	**In 50 y** (11%)	**In 100 y** (9%)	**Never** (7%)	Row **Total**
A great deal	24%	17%	7%	3%	6%	<1%	14%
A moderate amount	40%	46%	25%	21%	8%	7%	31%
Only a little	30%	29%	47%	37%	26%	8%	31%
Not at all	7%	8%	21%	38%	61%	85%	24%

Question wording: "How much do you think climate change will harm you personally?" AND "When do you think climate change will start to harm people living in Canada?"
Note: $x^2 = 367.18$; $df = 946$; $p = 0.0000$

Table 2 presents the bivariate frequency distribution of personal risk and perceived timing of harm caused by climate change in Canada. For easier interpretation, the 24 cases of "not sure" responses for the variable personal risk and the 41 cases of "not sure" responses on the timing variable were omitted from the present analysis. From the remaining cases, we found that a plurality (45%) of Canadians perceives climate change to already be harming people in the country. Fifty-nine percent believe climate change will start to harm Canadians in less than a decade. Very few (7%) believe climate change will never harm Canadians. However, we also found that very few (14%) Canadians perceive themselves to be at a great deal of risk from a changing climate. Most (55%) believe climate change poses little to no risk to them personally. To be sure, there is a relationship between perceived threat and timing of climate change. The further in the future people perceive negative impacts from climate change, the less they feel personally at risk. Conversely, the sooner the perceived negative impacts, the more people feel they are at risk of personally being harmed. Yet among those who believe climate change is already harming Canadians, most (70%) feel they are only affected from a little to a moderate amount. There thus appears to be a disconnect: despite perceptions that climate change will harm people living in Canada, few feel personally at risk.



Question wording: "How much do you think climate change will harm [you personally] future generations in Canada?
Note: order of questions was rotated

Figure 3: Climate change risk perceptions in Canada

If Canadians don't perceive themselves as personally at risk from a changing climate, who then is likely to be harmed? Mos Canadians assess their vulnerability on a spectrum that ranges from "only a little harm" (three out of ten) to "moderate harm" (also three out of ten). Nearly a quarter of Canadians believe climate change poses no threat whatsoever to them personally. In contrast, risk perceptions for future generations are much greater. For instance, though few Canadians perceive themselves as considerably vulnerable in a warming world, a near majority believes future generations are at a great deal of risk. Less than 10% say future generations face no risk at all. In other words, the problem of climate change is generally perceived less as an individual problem than as a collective and social problem, one whose most severe consequences will be felt by generations yet unborn. Communicating the real and tangible risks of climate change to Canadians would appear to be an important element in galvanizing public concern.

3

DESPITE THE URGENCY OF THE PROBLEM, THE CLIMATE CHANGE ISSUE IN CANADA CURRENTLY LACKS SALIENCY

The climate is a complex system and, for the average citizen, the scientifically documented long-term warming trend cannot be easily inferred from personal experience. It requires people to acquire and evaluate different types of information (Swim et al. 2011). Knowledge of climate change therefore plays an important—if only partial—role in forming attitudes. However, not all individuals are equally motivated to invest time and resources in acquiring such information. John Krosnick uses the term "issue public" to describe the segment of the population most passionate about a particular policy issue (Krosnick 1990; 1995). While this concept can be measured in different ways, such as enquiring about the importance of an issue, for instance, knowledge of an issue may also serve as an indicator of which members of a population are most passionate about an issue. Indeed, the extent to which an individual bothers to become well informed about a given issue is a useful proxy for how important they perceive that issue to be.

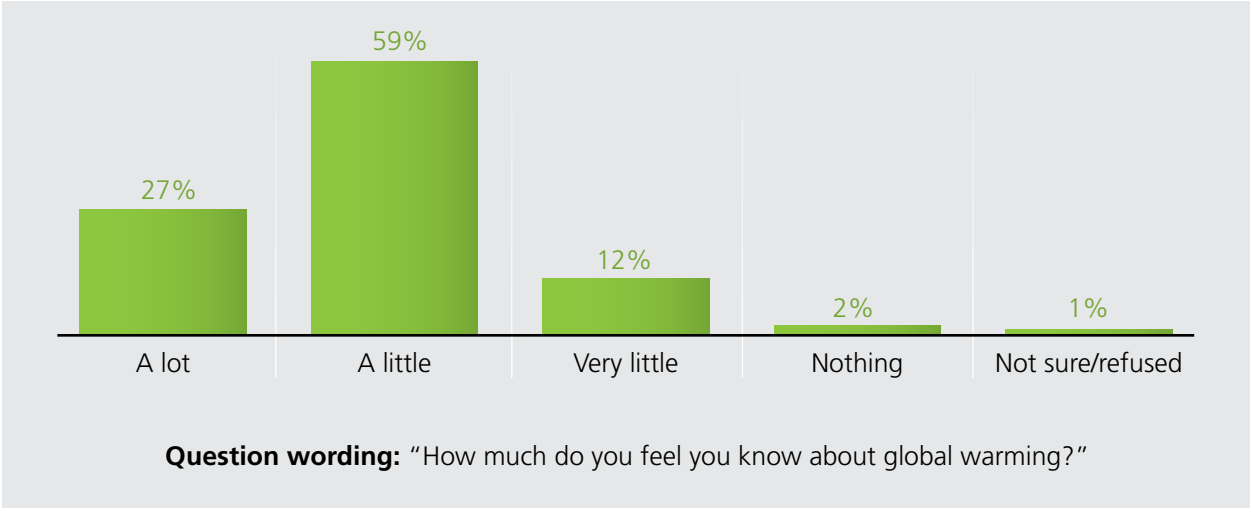


Figure 4: Attention to the issue of climate change in Canada

When asked to assess their own understanding of global warming, barely one in four Canadians responded by saying they know "a lot" (Figure 3). This low level of issue saliency in fall 2015 is consistent with the fact that climate change was barely mentioned in the 2015 federal election campaign. In past research (2014), we examined level of knowledge around climate change using objective measures of factual climate change knowledge, which highly correlated with the self-assessment scale. It also suggested most Canadians know little about even the basics of climate science. For instance, of 1401 people polled in the 2014 CSEE, only a third of respondents correctly answered a question on whether climate scientists believe carbon dioxide is responsible for the hole in the ozone layer. The same proportion correctly answered a question about whether methane is a more powerful greenhouse gas than carbon dioxide. All of this suggests that, in their "finite pool of worry" (Weber 2006) few Canadians care enough about global warming to become well informed. Thus, we find little evidence that the Canadian public is sufficiently literate and broadly mobilized on the issue of climate change.

4

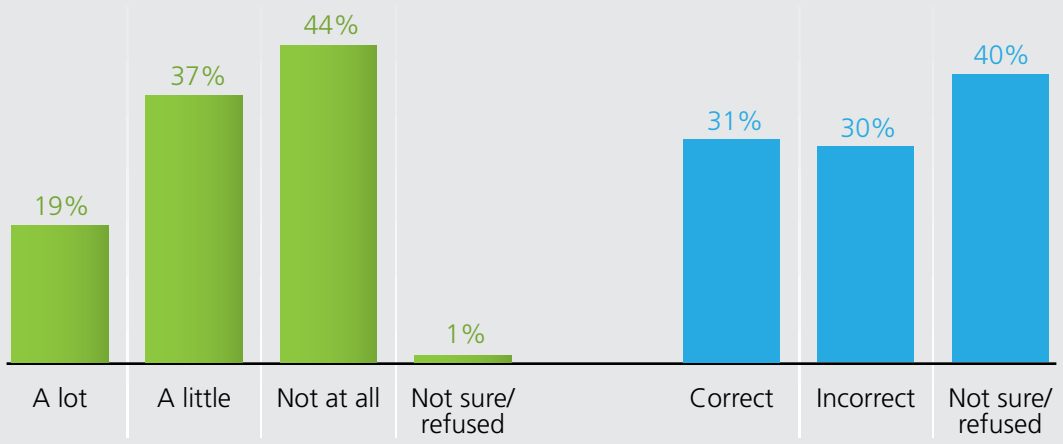
THOUGH SOME PROVINCES HAVE TAKEN ACTION, CANADIANS REMAIN UNINFORMED ABOUT CLIMATE POLICY

This lack of public attention also has major consequences on climate policy literacy. In fact, we found that Canadians are generally uninformed about the key policy instruments offering the best hope of reducing greenhouse gas emissions. For instance, there is now a virtual consensus among many policy experts, including economists of various political stripes and international organizations like the World Bank and OECD, that a key pillar in climate policy is to establish a price on carbon pollution (Lachapelle 2011). Although different instruments may be used for this end, politicians have tended to shy away from more visible carbon taxes, given the widely held view that voters generally dislike new taxes (Rabe and Borick 2012). For this reason, cap-and-trade systems, which also establish a price on carbon, are thought to have several distinctive political advantages over carbon taxes (Paterson 2012) and have been widely adopted around the world (Kossoy et al. 2015). Notably, such policies are currently at to the top of American and Chinese policy agendas in 2015. In Canada, the governments of Quebec, Ontario, Manitoba and British Columbia were all, at one time, full members of the Western Climate Initiative (WCI), a voluntary partnership among several provinces and U.S. states intent on establishing a regional cap-and-trade system to coordinate emissions reductions across jurisdictions. Since its creation in 2007, however, most of the original members have rescinded their commitment, leaving only Quebec, California and more recently Ontario (in 2015) as jurisdictions that have explicitly adopted and, in some cases (Quebec and California in 2012) , linked their cap-and-trade programs.

To measure public awareness around this policy, we briefly described it to Canadians (see question wording below Figure 5). We then asked individuals whether they had heard a lot about this system, a little or nothing at all. As the blue bars show on the left panel of Figure 5, a large plurality (nearly half) of Canadians reports having heard nothing at all about cap-and-trade. Though roughly a third of Canadians say they are somewhat familiar with this instrument, very few (about 1 in 5) say they have heard "a lot" about this policy.

This low level of self-reported familiarity with cap-and-trade was further verified with a factual question asking Canadians to indicate whether their province has adopted such a program. Answers were coded so that respondents in Quebec and Ontario responding "Yes", and respondents in all other provinces offering "No" to the question "…has your province adopted such a program" were coded as correct. All others were coded as incorrect, except for those who explicitly mentioned they were not sure or refused to answer. Results from this test are reported with the blue bars on the right panel of Figure 5. They further demonstrate that cap-and-trade policy is not well known among Canadians. About seven out of ten respondents either answered incorrectly (for instance, saying their provincial government had no cap-and-trade policy when, in fact, it did) or chose not to answer. In fact, a plurality (about two out of five respondents) falls into this latter category of explicitly unsure. We subsequently tabulated correct, incorrect and unsure responses on awareness of policy with self-reported knowledge of global warming (not shown). The results suggest that there is some confusion even among those who believe they know "a lot" about the issue. For instance, those who say they know "a lot" are more likely (41%) to offer correct responses than those who say they know "a little" (28%) or "very little" (19%) about the global warming issue. However, those who say they know "nothing" are equally as likely (40%) to answer correctly whether or not their province has adopted a cap-and-trade system. Moreover,

among those who say they know "a lot," a good portion offer incorrect (29%) and "unsure" (30%) responses. The results were replicated when we tabulated the awareness question with how much an individual has heard about cap-and-trade. Overall, this suggests the public holds ambiguous views about this policy. Indeed, the right panel of Figure 5 reveals an interesting distribution: an equal split between correct and incorrect responses. This suggests that some unsure respondents randomly made a correct choice (Converse 1964; 1970). In other words, the minority of Canadians who correctly identified whether or not their province has adopted a system of cap-and-trade may be a generous estimate of how aware Canadians are of this policy. Clearly, this policy, which experts believe to be a central pillar in government responses to climate change, is not well understood by the public.



Question wording: "Some provinces and a number of US states have adopted a policy known as cap-and-trade where the government issues permits limiting the amount of greenhouse gases that companies can put out. If a company exceeds their limit, they have to buy more permits. If they don't use all of their permits, they can sell or trade them to others who exceed their cap. The idea is that companies will find ways to put out less greenhouse gases because that would be cheaper than buying permits." […] "Have you heard a lot about this system, a little, or nothing at all?" […] "To the best of your knowledge has your province adopted such a program"?

Figure 5: Awareness of cap-and-trade

Cap-and-trade is indeed a complex policy not often covered in the media, even in Quebec where such a system has been in place since 2012. Some might see this as a potential advantage, a form of carbon pricing by stealth. According to this view, the relative opacity of cap-and-trade contributes to its political acceptability since what is less visible is also likely to be less controversial. An alternative reading is also possible, however. Research on framing in competitive environments reveals that it is possible for some groups to gain a framing advantage over others (Chong and Druckman 2006). In a low-information environment, for instance, negative frames that resonate strongly with the public can quickly become a frame of reference. From this perspective, the low level of information about cap-and-trade could make this policy more vulnerable to the communication strategies of its opponents. We explored the distribution of support for cap and trade by how much an individual has heard about this policy. We ask: Is the information currently circulating around cap-and-trade more likely to increase or decrease support for this policy?

Table 3: Support for cap-and-trade by awareness of policy

	A lot (19%)	**A little** (37%)	**Not at all** (44%)	**Row Total**
Strongly support	34%	29%	25%	28%
Somewhat support	28%	40%	42%	38%
Somewhat oppose	9%	15%	11%	12%
Strongly oppose	26%	9%	8%	12%
Not Sure	4%	7%	13%	9%

Question wording: Some provinces and a number of US states have adopted a policy known as cap-and-trade where the government issues permits limiting the amount of greenhouse gases that companies can put out. If a company exceeds their limit, they will have to buy more permits. If they don't use all of their permits, they will be able to sell or trade them to others who exceed their cap. The idea is that companies will find ways to put out less greenhouse gases because that would be cheaper than buying permits." […] "Have you heard a lot about this system, a little, or nothing at all?" […] "Do you strongly support, somewhat support, somewhat oppose or strongly oppose a cap-and-trade system in your province?"
Note: $x^2 = 69.77$; $df = 1000$; $p = 0.0000$

Table 3 presents in a contingency table results of the bivariate relationship between support for cap-and-trade and awareness of this policy. For simplicity, the five respondents not sure of having heard of cap-and-trade were omitted from the analysis. Respondents (n=99) who were unsure of whether they would support a system of cap-and-trade were kept in a separate category of "not sure" for the purpose of this analysis, given their relatively large number and potentially meaningful position. Examined discretely, we found that a majority (66%) of Canadians support a cap-and-trade system, though we also found that roughly one out of four oppose such a system in their province. When broken out in Table 3, we find a relationship between greater attention to cap-and-trade and support for this policy. The more Canadians had heard about cap-and-trade, the more likely they were to support this policy. However, at other levels of support, information appears to play a different and, at times, less important role. For instance, among those unaware of cap-and-trade, we saw a tendency for soft support (likely, acquiescence bias but also potentially a result of the question preamble describing cap-and-trade). This suggests that once provided with some information, the policy makes sense to individuals and they give it their soft support. Among those who had heard a lot about cap-and-trade, a non-trivial number (about one out of four) was in strong opposition. This is smaller than the third of informed Canadians who strongly support cap-and-trade, but it does suggest that information alone is not the primary cause of support. Of course, there is some likely self-selected information that drives these differences. Nevertheless, there appear to be some advantages to clearly communicating the benefits of cap-and-trade, including increasing overall support for and resiliency of this policy.

5

CANADIANS ARE GENERALLY UNWILLING TO PAY LARGE SUMS TO SUPPORT INCREASED PRODUCTION OF DECARBONIZED ENERGY, THOUGH THIS WILLINGNESS INCREASES WITH ADHERENCE TO THE SCIENTIFIC CONSENSUS ON GLOBAL CLIMATE CHANGE

Mitigating GHG emissions to avoid dangerous climate change essentially involves behavioural and structural changes in the production, consumption and investment of energy. Individuals can contribute by choosing more energy-efficient products and services, consuming less and investing in less carbon-intensive forms of energy production, if at a premium. For instance, some private companies operating on Canadian markets, such as Bullfrog Power, offer energy consumers the option of purchasing electricity produced by renewable energy at a premium price of 2.5 cents per KWh (about $1 per day) so that more renewable energy is injected into the electricity grid. The idea is to provide energy consumers an opportunity to assist in generating more sustainable energy (small hydro and wind) across Canada.

To what extent are Canadians willing to pay for the production of more renewable energy? According to the information reviewed thus far, we might expect little. Why pay for a problem that is not well understood, for which humans are not deemed responsible, whose effects are perceived as impersonal, and whose solutions are not well understood? Indeed, we could expect those whose views mirror the scientific consensus on climate change to be more willing to pay for more renewable energy than those who are either sceptical of a warming trend or of humanity's role in it (c.f. Figure 2). We examine this possibility in Table 4.

Table 4: Willingness to pay for more renewable energy according to adherence to the climate change consensus

	GW real and human	GW sceptic	Row total
$500+	9%	5%	7%
$250 - $500	10%	5%	7%
$100 - $250	17%	13%	15%
$50 - $100	21%	18%	20%
$1 - $50	26%	22%	24%
Nothing	16%	35%	25%
Not sure	2%	3%	3%

Question wording: "If it required you to pay extra money each year in order for more renewable energy to be produced, how much would you be willing to pay?"
Note: $x^2 = 60.82$; $df = 1004$; $p = 0.0000$

5

When asked how much they would be willing to pay for more renewable energy to be produced, most Canadians (about one in four) say they would be willing to pay nothing. Of those who are willing to pay, a plurality (about forty-five percent) are willing to pay between $1 and $100 a year. This is substantially less than what it currently costs Bullfrog power consumers in Canada. When broken down by adherence to the scientific consensus on climate change, differences emerge in the public's willingness to pay for renewable energy. For instance, those with more sceptical views are twice as likely to say they are willing to pay nothing, though 63% of sceptics are also willing to pay something. Conversely, those whose views on climate change are closer to the prevailing scientific consensus are more willing to pay larger amounts of money for more renewable energy to be produced. Overall, however, there is a low propensity to pay large sums of money to increase the production of renewable energy, regardless of views on climate change. To foster a culture where individuals are willing to pay more, the benefits of renewable energy and climate policies will need to be better communicated to the public.

CONCLUSION

At present, we see limited evidence to suggest that Canadian public opinion constitutes a pressure on government for more climate action. In this study, we provided five key reasons to support this general finding. First, Canadian opinion is somewhat divided on the role of human activity in climate change: only half believes it is both real and caused primarily by humans. If those with more ambiguous views on humans' role are included, two-thirds of Canadians at best attribute climate change at least in part to human activity. Second, despite that many perceive likely harm from climate change in the relatively short term, few Canadians believe they are personally at risk. Third, despite scientific calls for swift and decisive action to mitigate the effects of climate change, a minority of Canadians care enough to become informed about this issue. Fourth, Canadians have a rudimentary knowledge of climate policy, confirming the low salience of climate change. Fifth, Canadians as a whole are willing to pay only between $1 and $100 per year for more renewable energy to be produced. This amount is likely far below any transitional costs required to significantly expand renewable energy across the country.

These results suggest that public sensitization on the issue of climate change remains partial, at best. Large segments of the Canadian population are still unclear on the causes, consequences and policy solutions that can be put in place to respond to the problem of a warming world. As long as public awareness-raising is incomplete, public opinion on this issue will unsurprisingly be limited to a narrowly defined "issue public." Other citizens will remain more attentive and sensitive to other problems (like the economy, for instance), which are more concrete and show more immediate benefits. It will also be difficult to garner public support for new climate policies if the rationale for such policies is not well understood. If Trudeau's newly elected government is serious about implementing ambitious climate policy, it will need to seriously engage with the Canadian public on the problem of climate change, its causes, likely consequences and most appropriate policies. To move forward, more research is needed on the types of policies and solutions most likely to address the problems of climate change in a way that resonates with Canadian public opinion. Though understanding policy options—particularly economic instruments—will be important, communications should focus on the broader benefits of transitioning toward a decarbonized economy and illustrate the concrete economic, lifestyle and health benefits, for instance. Future research should also more closely examine which co-benefits Canadians most value. To the extent that Canadians trust scientists, greater effort should also be made to openly discuss and communicate the latest scientific findings, including with respect to likely consequences of climate change for people living in Canada.

Two caveats to these conclusions are, however, in order. First, simply providing Canadians with more information is unlikely to change attitudes, given individuals' well-documented tendency to discount information and sources perceived as being at odds with one's fundamental predispositions (Kahan et al. 2012; Lachapelle et al. 2014). This implies that science communication should be targeted to resonate with the values of different audience segments in the Canadian population. Future research should go further in identifying the value structure in Canada in the goal of developing more targeted communication strategies. Second, our report is limited in that it provides a very basic descriptive analysis and made some effort to highlight bivariate relationships among key variables. Future research should dig deeper into these relationships, particularly with respect to unpacking the various causes of climate change scepticism with more sophisticated multivariate analyses. Future research should also put public attitudes in context and pay greater attention to how attitudes evolve in the face of a changing climatic, economic, social and political environment in which the media plays the important role of disseminating information.

METHOD

The survey used for this study was designed by Chris Borick (Muhlenberg College), Barry Rabe (University of Michigan) and Erick Lachapelle (Université de Montréal). The instrument was administered to a nationally representative sample of 1,014 Canadians aged 18 and over. All interviews in Canada were conducted via telephone in English and French from September 1, 2015, to September 15, 2015. Calls were made using both landline (601 completes) and mobile (413 completes) phone listings. Up to seven callbacks were made. The AAPOR RR3 Response Rate was 8% overall. The margin of sampling error for the full sample is about 3.1% in 19 of 20 samples. Results reported here are weighted according to gender, age and region to reflect the latest population estimates from Statistics Canada (Census 2011).

REFERENCES

- Anderegg, William R. L. James W. Prall, Jacob Harold and Stephen H. Schneider. 2010. "Expert credibility in climate change." *Proceedings of the National Academy of Sciences of the United States of America* 107(27): 12107-9. doi:10.1073/pnas.1003187107
- Anderson, Bruce and David Coletto. 2014. *Should carbon be priced? Should public opinion decide pipelines?*. Canadian Public Opinion Poll. Online. URL: ***http://abacusdata.ca/wp-content/uploads/2015/01/CarbonRelease_Dec2014.pdf***. Consulted on January 23, 2015.
- Angus Reid Institute. 2014. *Majority of Canadians call for more robust efforts to curb climate change*. Canadian Public Opinion Poll. Online. URL: ***http://angusreid.org/wp-content/uploads/2014/10/Climage-Change-Efforts-ARI-23-10-14.pdf***. Consulted on October 25, 2014.
- Angus Reid Institute. 2015. "Most Canadians support carbon pricing; but less consensus on effectiveness of such measures." Canadian Public Opinion Poll. Online. URL: ***http://angusreid.org/wp-content/uploads/2015/04/Cap-and-Trade2.pdf***. Consulted on April 25th 2015.
- Borick, Christopher, Barry G. Rabe and Sarah B. Mills. 2015. "Acceptance of Global Warming Among Americans Reaches Highest Level since 2008" *Issues in Energy and Environmental Policy* 25: 1-8. CLOSUP, University of Michigan.
- CBC News. 2015a. "Albertans support tougher climate-change policies, including carbon tax, poll says." Online. URL: ***http://www.cbc.ca/news/canada/calgary/poll-pembina-alberta-climate-change-1.3249966***. Consulted on October 2, 2015.
- CBC News. 2015b. "Vote Compass: Most feel government should do more to combat climate change." Online. URL: ***http://www.cbc.ca/news/politics/vote-compass-canada-election-2015-environment-issues-1.3270365***. Consulted on October 17, 2015.
- Chong, Dennis and James N. Druckman. 2007. "A Theory of Framing and Opinion Formation in Competitive Elite Environments" *Journal of Communication* 57: 99-118.
- Cook, Jon, Dana Nuccitelli, Sarah A. Green, Mark Richardson, Bärbel Winkler, Rob Painting, Robert Way, Peter Jacobs and Andrew Skuce. 2013. "Quantifying the consensus on anthropogenic global warming in the scientific literature." *Environmental Research Letters* 8(2): 1-7. doi:10.1088/1748-9326/8/2/024024
- de Marcellis-Warin, Nathalie, Ingrid Peignier, Minh Hoang Bui, Miguel F. Anjos, Steven A. Gabriel, and Carla Guerra. 2015. *L'énergie et les changements climatiques : portrait des perceptions québécoises*. Report of L'Institut de l'énergie Trottier and CIRANO. Online. URL: ***http://www.polymtl.ca/iet/doc/ChangementsClimatiques_FR_web-Aout15.pdf***. ISBN: 978-2-924597-01-9. Consulted on June 4, 2015.
- Environics Institute. 2015. *Canadian public opinion about climate change*. Report of the Focus Canada public opinion research program. Online. URL: ***http://www.environicsinstitute.org/uploads/institute-projects/environicsinstitute-dsf%20focus%20canada%202015%20-%20climate%20change%20survey%20-%20final%20report%20-%20english.pdf***. Consulted on September 21, 2015.
- Giddens, Anthony. 2009. *The Politics of Climate Change*. Polity Press, Cambridge, UK.
- IPCC. 2014. *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.
- Holladay, J. Scott, Jonathan Horne, and Jason A Schwartz. 2009. Economists and Climate Change: Consensus and Open Questions. New York: Institute of Policy Integrity, New York University School of Law.
- Kossoy, Alexandre, Grzegorz Peszko, Klaus Oppermann, Nicolai Prytz, Noémie Klein, Kornelis Blok, Long Lam, Lindee Wong, and Bram Borkent. 2015. *State and Trends of Carbon Pricing 2015*. World Bank and Ecofys Joint Report, Washington, DC. doi:10.1596/ 978-1-4648-0725-1
- Krosnick, Jon and Shibley Telhami. 1995. "Public Attitudes toward Israel: A Study of the Attentive and and Issue Publics." *International Studies Quarterly* 39(4): 535-54.
- Krosnick, Jon. 1990. "Government Policy and Citizen Passion: A Study of Issue Publics in Contemporary America." *Politcal Behavior* 12(1): 59-92.

- Lachapelle, Erick. 2011. "Energy Security and Climate Change Policy in the OECD: The Political Economy of Carbon-Energy Taxation." PhD Dissertation, University of Toronto.
- Lachapelle, Erick, Christopher Borick and Barry Rabe. 2014. "Public Opinion on Climate Change and Support for Various Policy Instruments in Canada and the US." *Issues in Energy and Environmental Policy* 11: 1-21. CLOSUP, University of Michigan (pp. 1-21).
- Lachapelle, Erick, Éric Montpetit and Jean-Philippe Gauvin. 2014. "Public Perceptions of Expert Credibility on Policy Issues: The Role of Expert Framing and Political Worldviews" *Policy Studies Journal* 42(4): 2014.
- Lachapelle, Erick, Shannon Dinan, Christopher Borick, Barry Rabe and Sarah Mills. 2015. "Mind the Gap: Climate Change Opinions in Canada and the United States" Woodrow Wilson International Center for Scholars and the Canada Institute, Washington, DC. Online. ***file:///Users/lachape/Downloads/wilson.report.mind_the_gap.2-2.pdf***. Consulted on November 1, 2015.
- Martel-Morin, Marjolaine, Érick Lachapelle, Pierre Martin, Christopher Borick, and Barry Rabe. 2015. "L'opinion publique canadienne sur les changements climatiques et les politiques de contrôle des émissions de gaz à effet de serre." *Notes & Analyses on the USA* 30, 13p.
- Office of the Auditor General of Canada. 2012. Report of the Commissioner of the Environment and Sustainable Development (Spring). Chapter 2 — Meeting Canada's 2020 Climate Change Commitments. Online. URL: ***http://www.oag-bvg.gc.ca/internet/English/parl_cesd_201205_02_e_36774.html***. Consulted on May 19, 2015.
- Office of the Auditor General of Canada. 2014. Report of the Commissioner of the Environment and Sustainable Development (Fall). Chapter 1 — Mitigating Climate Change. Online. URL: ***http://www.oag-bvg.gc.ca/internet/English/parl_cesd_201410_01_e_39848.html***. Consulted on May 19, 2015.
- Paterson, Matthew. 2012. "Who and What are Carbon Markets For? Politics and the Development of Climate Policy" *Climate Policy* 12(1): 82-97.
- Rabe, Barry G. and Christopher P. Borick. 2012. "Carbon Taxation and Policy Labeling: Experience from American States and Canadian Provinces." *Review of Policy Research* 29(3): 358-82. doi:10.1111/j.1541-1338.2012.00564.x
- Rudny, Bernard. 2015. *Albertans' opinions on climate change, energy and the environment*. A Pembina Institute Report. Online. URL: ***http://www.pembina.org/reports/ab-opinions-fall-2015.pdf***. Consulted on October 11, 2015.
- Schuldt, Jonathon P., Sara H. Konrath, and Norbert Schwarz. 2011. ""Global Warming" or "climate change"? Whether the planet is warming depends on question wording." *Public Opinion Quarterly* 75(1): 115-124.
- Smith, Joel B., Stephen H. Schneider, Michael Oppenheimer, Gary W. Yohe, William Hare, Michael D. Mastrandrea, Anand Patwardhan, Ian Burton, Jan Corfee-Morlot, Chris H.D. Magadza, Hans-Martin Füssel, A. Barrie Pittock, Atiq Rahman, Avelino Suarez, and Jean-Pascal van Yperselen. 2009. "Assessing dangerous climate change through an update of the Intergovernmental Panel on Climate Change (IPCC) "reasons for concern"." *Proceedings of the National Academy of Sciences of the United States of America* 106(11): 4133–4137. doi:10.1073/pnas.0812355106
- Swim, Janet K., Paul C. Stern, Thomas J. Doherty, Susan Clayton, Joseph P. Reser, Elke U. Weber, Robert Gifford, and George S. Howard. 2011. "Psychology's Contributions to Understanding and Addressing Global Climate Change." *American Psychologist* 66(4): 241-50. doi:10.1037/a0023220
- UN. 1992. *United Nations Framework Convention on Climate Change*. Online. URL: ***http://unfccc.int/resource/docs/convkp/conveng.pdf***. Consulted on September 22, 2015.
- Weber, Elke. 2006. "Experience-Based and Description-Based Perceptions of Long-Term Risk: Why Global Warming Does Not Scare Us (Yet)" *Climatic Change*. 77: 103-120.
- WMO. 2015. "Record Global Temperatures and High Impact Weather and Climate Extremes" World Meteorological Organization. Online. URL: ***https://www.wmo.int/media/content/record-global-temperatures-and-high-impact-weather-and-climate-extremes***. Consulted on October 23, 2015.

ISBN: 978-2-924597-06-4 // 978-2-924597-05-7