

NETWORK PROCESSES RELATED TO POLITICAL DISCOURSE AND POLICY
POSITIONS: THE CASE OF CLIMATE CHANGE POLICY NETWORKS IN CANADA.

by

Adam C. Howe

B.A. Hons., McMaster University, 2014

M.A., McMaster University, 2015

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

in

The Faculty of Graduate and Postdoctoral Studies

(Sociology)

THE UNIVERSITY OF BRITISH COLUMBIA

(Vancouver)

March 2022

© Adam C. Howe, 2022

The following individuals certify that they have read, and recommend to the Faculty of Graduate and Postdoctoral Studies for acceptance, the dissertation entitled:

Network processes related to political discourse and policy positions: the case of climate change policy networks in Canada

submitted by Adam C. Howe in partial fulfillment of the requirements for

the degree of Doctor of Philosophy

in Sociology

Examining Committee:

David B. Tindall, Sociology, UBC

Supervisor

John McLevey, Knowledge Integration, U Waterloo

Supervisory Committee Member

Catherine Corrigan-Brown, Sociology, UBC

University Examiner

Simon Donner, Geography, UBC

University Examiner

Additional Supervisory Committee Members:

Rima Wilkes, Sociology, UBC

Supervisory Committee Member

Mark C. J. Stoddart, Sociology, MUN

Supervisory Committee Member

Abstract

In this dissertation I address the question of how social-structural network processes (such as the structural position of network actors, social influence, and social selection) are related to political discourses, perceived political influence, and policy positions of network actors, with respect to global climate change in the context of Canadian climate change policy making. Based on data collected from representatives of organizations, I conduct a series of analyses focused on aspects of this broader theoretical question. I begin by structurally analyzing five different types of network relations amongst climate change policy actors in Canada focusing on subgroup membership and core-periphery structures. The network relations are collaboration, communication, sharing of scientific information (these three are types of interaction networks), perceived influence in domestic climate change policy, and perceived influence on the respondent's own organization (these two are types of influence networks). I find that subgroups comprised mainly of research and environmental actors are central within interaction networks, but less central in influence networks. Conversely, groups comprised mainly of business and government actors are less central in interaction networks and highly central in influence networks. I then build on this finding by analyzing how media coverage for environmental actors is associated with their perceived policy influence. I find a negative association between media coverage and perceived policy influence for individual activists, but not for environmental movement organizations. This finding challenges established literature that suggests environmental actors who garner more media coverage should be perceived as more influential in policy networks. Then I build on extant research on policy networks that focuses on explaining policy successes and/or failures that often rely on the Advocacy Coalition Framework (ACF). I argue this ACF approach leads to an incomplete understanding of the social dynamics of climate change policy making. I incorporate a policy network analytic approach to show the role that micro-structural network processes related to reciprocity, structural equivalence and transitive closure play in giving rise to informal policy networks, along with policy beliefs.

Lay Summary

Climate change is a global problem. Canada has some policies that may help reduce carbon emissions, but has also made some decisions working against this objective. Making climate change policy involves actors coming together into networks, who interact with each other to advocate for particular policy options. Some also have public conversations in the media. In these contexts, they judge the influence of other actors. My study looks at how these factors are interrelated. I find that research and environmental actors are important in some of the networks, but not seen as very influential. I also find that for some environmental actors, media coverage makes them seem less influential. I also find some of the policy beliefs actors have are important in explaining the structure of a collaboration network, but the specific ways that two network actors can be connected are also important for explaining the emergence of network ties.

Preface

This thesis is original work completed by Adam Howe. Guidance was given by the supervisory committee.

For Chapter Two I was responsible for data cleaning, preparation, and analysis and writing the text. Drs. Tindall and Stoddart originally collected the data, and provided guidance and feedback on the chapter, before its submission as part of this dissertation. This research is covered under the approval from the UBC Behavioural Research Ethics Board under UBC ethics certificate number H12-02465.

A version of Chapter Three was originally published as a research article (Howe, Stoddart, & Tindall, 2020) in the journal *Politics and Governance*. I was responsible for data cleaning, preparation, and analysis and writing the text. My coauthors originally collected the data, and helped with revisions of the manuscript before publication. This research is covered under the approval from the UBC Behavioural Research Ethics Board under UBC ethics certificate number H12-02465.

Howe, A. C., Stoddart, M. C. J., & Tindall, D. B. (2020). Media Coverage and Perceived Policy Influence of Environmental Actors: Good Strategy or Pyrrhic Victory? *Politics and Governance*, 8(2), 298. <https://doi.org/10.17645/pag.v8i2.2595>

A version of Chapter Four has been accepted for publication, and has been advanced published online, as a research article (Howe, Tindall, & Stoddart, 2021) in the journal *Social Networks*. I was responsible for data cleaning, preparation, and analysis and writing the text. My coauthors originally collected the data and helped with revisions of the manuscript before publication. This research is covered under the approval from the UBC Behavioural Research Ethics Board under UBC ethics certificate number H12-02465.

Howe, A. C., Tindall, D. B., & Stoddart, M. C. J. (2021). Drivers of tie formation in the Canadian climate change policy network: Belief homophily and social structural processes. *Social Networks*. <https://doi.org/10.1016/j.socnet.2021.06.004>

Table of Contents

Abstract	iii
Lay Summary.....	iv
Preface	v
Table of Contents.....	vi
List of Tables.....	xii
List of Figures	xiii
List of Abbreviations	xiv
Acknowledgements	xv
Dedication.....	xvii
Chapter 1: Introduction.....	1
1.1 Statement of the Problem - Climate Change in Canada	2
1.1.1 Government in Canada	4
1.1.2 Canadian Federal Government	4
1.1.3 International Agreements and Treaties.....	7
1.1.4 Kyoto Accord	8
1.2 Carbon Pricing in Canada.....	10
1.2.1 Provincial Climate Change Policy Making	14
1.2.2 Federal Climate Change Policy	18
1.3 Literature Review	20
1.3.1 Social Networks.....	23
1.3.2 Policy Networks	24

1.3.3	Policy Network Analysis	25
1.3.4	Social Structure and Social Influence.....	26
1.3.5	Social Influence and Social Selection	31
1.4	Common Theoretical Frameworks for Policy Network Analysis	34
1.4.1	The Organizational State Perspective.....	34
1.4.2	Institutional Analysis.....	35
1.4.3	Epistemic Communities.....	36
1.4.4	Policy (or Social) Learning.....	37
1.4.5	The Advocacy Coalition Framework	38
1.5	Social Movements and Discourse Networks.....	39
1.5.1	Discourse Network Analysis	44
1.5.2	Summary of Literature Review	46
1.6	Methods	48
1.6.1	International COMPON Project	49
1.6.2	Canada COMPON Project.....	51
1.6.3	Sampling Frame: Number of Organizations.....	54
1.6.4	Interviews	54
1.6.5	Survey Questionnaire	55
1.6.6	Survey Response Rates.....	56
1.6.7	Ethics	57
1.6.8	Adam Howe’s Contribution.....	58
1.6.9	Survey Questions.....	58
1.6.10	Sampling.....	59

1.7	Summary.....	61
Chapter 2: Social structure and social influence in Canadian climate change networks.....		63
2.1	Introduction	63
2.2	Literature Review	67
2.2.1	The Social Network Approach	67
2.3	Data.....	71
2.3.1	Overview of the Networks.....	72
2.3.2	Distributions of Degree Centrality	73
2.3.3	QAP Correlation Analysis	78
2.4	Subgroup Analysis.....	80
2.4.1	Leiden Algorithm for Detecting Connected Subgroups.....	80
2.4.2	Core-Periphery and <i>k</i> -cores	84
2.5	Discussion.....	91
2.6	Conclusion	93
Chapter 3: Media Coverage and Perceived Policy Influence of Environmental Actors:		
Good Strategy or Pyrrhic Victory?.....		96
3.1	Introduction	96
3.2	Literature Review	98
3.2.1	Influence	98
3.2.2	Media and Public Policy.....	100
3.2.3	Social Movements and Media Coverage	102
3.3	Hypotheses.....	104
3.4	Methods	105

3.4.1	Data.....	105
3.4.2	Measures.....	105
3.5	Analytic Strategy	108
3.6	Results	109
3.7	Discussion.....	113
3.7.1	A Pyrrhic Victory	113
3.8	Limitations.....	119
3.9	Conclusion.....	121

Chapter 4: Drivers of Tie Formation in the Canadian Climate Change Policy Network:

Belief Homophily and Social Structural Processes.....	124
4.1 Introduction	124
4.2 Literature Review	125
4.2.1 Policy Networks	125
4.2.2 Belief Homophily versus Structural Social Capital.....	129
4.3 Research Questions and Hypotheses	132
4.4 Methods	135
4.4.1 Analytic Strategy	136
4.4.2 Measures.....	137
4.5 Results	140
4.6 Discussion.....	143
4.6.1 Policy Beliefs – Similarities and Differences.....	143
4.6.2 Social Capital.....	147
4.6.3 Implications for the Policy Network Literature.....	148

4.7	Limitations.....	149
4.8	Summary.....	150
Chapter 5: Discussion and Conclusion		151
5.1	Introduction	151
5.2	Social Influence and Social Structure.....	151
5.3	Social Influence, Social Selection, and Policy Positions.....	153
5.4	Policy Discourse and Social Influence	155
5.5	Discourse Network Analysis and Social Movement Framing.....	156
5.6	Summary of Chapters	160
5.6.1	Chapter 2: Social Structure and Social Influence	160
5.6.2	Chapter 3: Political Discourse and Social Influence	162
5.6.3	Chapter 4: Micro-Structural Network Processes, and Policy Positions	163
5.7	Summary and Synthesis of Key Research Findings.....	164
5.7.1	Finding #1:.....	164
5.7.2	Finding #2:.....	168
5.7.3	Finding #3:.....	170
5.8	Limitations.....	171
5.9	Potential Paths for Future Research.....	176
5.10	A Note About Climate Change Issues and Indigenous Communities in Canada.....	188
References.....		191
Appendices		230
Appendix A: Interview Schedule		230
A.1	Preamble to Main Canada COMPON Interview	230

A.2	Interview Questionnaire	233
A.3	Appendix Note Regarding Interview Schedule	236
	Appendix B: Survey Questionnaire	238
	Appendix C: Core Membership Tables	282

List of Tables

Table 1.1 Summary of carbon prices & mechanisms in Canadian provinces and territories.....	12
Table 2.1 Summary of whole network statistics for five climate change networks.	72
Table 2.2 QAP intercorrelation coefficients for all five climate change policy networks.	79
Table 2.3 Summary of isolates for all five networks.....	84
Table 2.4 Results of k -core decomposition for all five networks with cores shaded grey.	85
Table 2.5 Distribution of substantive communities represented in core networks.....	90
Table 3.1 Descriptive statistics for non-categorical variables ($N = 171$).	106
Table 3.2 Descriptive statistics for actor type variable.	107
Table 3.3 Negative binomial Poisson regression of perceived.....	110
Table 3.4 Negative binomial Poisson regression of media coverage	112
Table 4.1 Descriptive statistics for belief homophily survey items ($N=44$).....	138
Table 4.2 ERGM Analysis of COMPON collaboration network.	141
Table 5.1 Summary of communities in interaction networks.....	282
Table 5.2 Summary of communities in interaction networks.....	284
Table 5.3 Summary of membership of k -cores for all five networks.	285

List of Figures

Figure 2.1. Collaboration network and log-log plot of degree distribution.....	74
Figure 2.2 Communication network and log-log plot of degree distribution.....	75
Figure 2.3 Scientific information network and log-log plot of in-degree distribution.....	75
Figure 2.4 Influence on organization network and log-log plot of in-degree distribution.....	76
Figure 2.5 Influence on domestic policy network and log-log plot of in-degree distribution.....	76
Figure 2.6 Collaboration network with periphery nodes masked, and core only.....	86
Figure 2.7 Communication network with periphery nodes masked, and core only.....	86
Figure 2.8 Scientific information network with periphery nodes masked, and core only.....	87
Figure 2.9 Influence on organization network with periphery nodes masked, and core only.....	87
Figure 2.10 Influence on domestic policy network, periphery nodes masked, and core only.....	88
Figure 2.11 Stacked bar chart of core membership for all five networks.....	89
Figure 3.1 Adjusted predictions of perceived policy influence nominations.....	114
Figure 4.1 Collaboration network with isolates removed.....	136
Figure 4.2 Goodness of fit diagnostics for full ERGM model (model 2).....	143

List of Abbreviations

ACF	Advocacy Coalition Framework
CCPI	Climate Change Performance Index
COMPON	Comparing Climate Change Policy Networks
COP	Conference of the Parties
DNA	Discourse Network Analysis
ENGO	Environmental non-governmental organization
EPS	Emissions performance standards
ERGM	Exponential Random Graph Model
GHG	Greenhouse gas
GWDSP	Geometrically weighted dyadwise shared partners
GWESP	Geometrically weighted edgewise shared partners
IPCC	The Intergovernmental Panel on Climate Change
LNG	Liquified natural gas
NGO	Non-governmental organization
OBPS	Output-based pricing system
RCM	The Western Climate Initiative Regional Carbon Market
SCEENR	Senate Committee on Energy, the Environment and Sustainable Development
SCESD	Standing Committee on the Environment and Sustainable Development
SPI	The science-policy interface
TIER	Alberta's Technology Innovation and Emissions Reduction program
TPES	Total primary energy supply per-capita

Acknowledgements

Thank you to my supervisor, Dr. David Tindall, and committee member Dr. Mark Stoddart, for giving me the opportunity to join an interesting, important, and impactful research project. Thank you, David (PI on the project) and Mark (co-PI on the project), for trusting me to take the lead on some of the analyses for my dissertation. Thank you both for your mentorship, and for your willingness to go above and beyond in working with me on turning around writing.

Thank you to my other committee members, Rima Wilkes and John McLevey for your support and guidance. John, my experience with you and the NetLab folks was invaluable in workshopping some of my analyses.

Thank you to my peers in the U.B.C. Sociology graduate program, including Kate Jaffe, Max Chewinski, and Tina Treleavan among all the others. We truly had a strong support system, and I will cherish all of those intellectual debates and friendships. Special thanks to François Lachapelle. Frank, our friendship has been one of the highlights of this journey for me. Whether sharing code and workshopping analyses over a few pints, or keeping each other motivated from different continents, I am grateful to have you as a friend.

Thank you to my partner Carleigh Sanderson. Without your love, support, and understanding, I would not have gotten to where I am today.

Thank you to my mother and stepfather, Gail and Ken, and to my sisters Kristy, Amber, and Meagan. You all have been my biggest supports throughout this journey, and I sincerely could

not have achieved any of this without you all. Thanks, Kris, for convincing me to take that first sociology course in the summer.

Thanks to the Social Sciences and Humanities Research Council, The University of British Columbia, and the Department of Sociology for funding my research.

“Like it or not, for the moment the Earth is where we make our stand.”

-Carl Sagan

Chapter 1: Introduction

In this introductory chapter I begin by laying out the statement of the problem that the research in this dissertation seeks to address – global climate change in the context of Canadian climate change policy making. I also discuss the more general theoretical motivation for this research – how social-structural network processes (such as structural position of network actors, social influence and social selection) are related to political discourses and policy positions. I summarize literature that pertains to this dissertation, and substantive details about the data I analyze. I provide a brief summary of the larger project through which this data was gathered, and touch on key methodological details pertinent to the analyses that follow. Unlike a more traditional dissertation structure involving separate chapters dedicated to a literature review and methods, I have opted to include the literature review and methodological sections in this chapter. This is because most aspects of the literature review and methodological details presented in this chapter also appear throughout the chapters that follow, and sometimes in greater detail. The analytical chapters in this dissertation are self-contained papers (as this is a ‘sandwich’ thesis that is composed of three related, but stand-alone, manuscripts that are either published or in preparation). Therefore, there is inevitably some repetition in terms of summaries of the literature and methodological details throughout this dissertation. I have endeavored to reduce the amount of repetition by including the required components related to literature and methods in this introduction and referring the reader to relevant appendices where applicable. I turn now to the statement of the problem.

1.1 Statement of the Problem - Climate Change in Canada

Global climate change is perhaps the most pressing environmental, political, social, and economic issue facing humanity today. Human activities are a primary driver of climate change as they impact all major components of the climate system (the atmosphere, hydrosphere, cryosphere, land surface, and biosphere). Moreover, climate change is affecting every inhabited region on earth (IPCC, 2021).¹ To limit future climate change to no greater than 1.5°C above pre-industrial times, policy makers must make decisive policy decisions to reduce greenhouse gas (GHG) emissions (such as CO₂ and methane, among others) to at least net-zero by 2050 (IPCC, 2021; Masson-Delmotte et al., 2018). Originally the goal of limiting warming to no greater than 2°C was set at the 2009 Conference of the Parties (COP) in Copenhagen. Recently as part of the Paris Agreement governments requested a special report from the IPCC comparing this original goal to an updated goal of limiting warming to no greater than 1.5°C. This updated report details how even with this new goal, there is a high likelihood of significant amounts of global catastrophe including the island states in the Pacific becoming submerged by sea level rise (Masson-Delmotte et al., 2018).

In attempts to monitor progress toward this general goal and provide a structure for accountability, a number of organizations have developed performance indexes. One such index

¹ This dissertation was being written during the global pandemic of SARS-CoV-2, also called Covid-19. This was an urgent health, economic, and socio-political issue that was at the forefront of global mobilization efforts. However, climate change is still arguably more serious – the number of climate change related deaths that have already occurred as a result of heat, extreme weather events, air and water pollution, food security, disease, etc. out shadow the number of possible deaths as a result of SARS-Cov-2 (Haines & Ebi, 2019), with many more projected. Also, climate change is a glacially slow-moving global disaster, prompting relative inaction as compared to the global response to the SARS-Cov-2 pandemic.

is the Climate Change Performance Index (CCPI). The CCPI is one of many possible indexes available to assess climate performance. It is used here since it captures a number of important facets of climate change performance² including national and international climate change policy (Burck, Uhlich, Bals, Höhne, & Nascimento, 2021), which is one of the main foci of this dissertation. In terms of climate change performance, Canada is a poor performer with respect to per-capita energy consumption, use of renewable energy sources, levels of GHG emissions, and climate policy. During the time the data analyzed in this dissertation were being gathered (2014-2015), Canada ranked 58th out of 61 countries and was in the top 10 largest GHG emitters (Burck, Marten, & Bals, 2013, 2014). As of the writing of this dissertation in December 2021 the country ranks 61st out of 64 countries (Burck, Nascimento, Höhne, & Nascimento, 2021). A brief summary of key aspects of the history of climate change policy making in Canada provides some insight into this performance record. Of particular interest is the observation that despite the change from a Conservative federal government skeptical about treating climate change as a serious issue (Hart, 2020) to a Liberal federal government ostensibly committed to dealing with climate change (detailed below), Canada remains stuck in the lower bandwidth of the CCPI.

To examine the history of climate change policy making in Canada requires some consideration of the form of government in Canada. As the focus of this dissertation is on Canadian climate

² The CCPI is weighted as follows: 20% climate policy (10% international, 10% national); 20% energy use in terms of total primary energy supply per-capita (TPES) (5% 2030 reduction targets compared to 2°C pathway, 5% current level compared to 2°C pathway, 5% past trends, 5% current level); 20% renewable energy (5% 2030 target compared to 2°C pathway, 5% current share of TPES compared to 2°C pathway, 5% development of energy supply from renewables, 5% current share of TPES); 40% GHG emissions (10% current level per-capita, 10% past trends per-capita, 10% current level per-capita compared to 2°C pathway, 10% 2030 reduction targets compared to 2°C pathway) (Burck, Uhlich, et al., 2021).

change policy networks, and in particular, national level policies, I begin the next section with an overview of the structure and process of policy making in Canada at the federal level. I then summarize the country's role in international climate change governance, and national and sub-national (i.e. regional and provincial) aspects related to climate change policy making as well.

1.1.1 Government in Canada

Canada is a decentralized federation of provinces and territories, with multiple layers of government. These layers are national (federal), provincial/territorial, and municipal. To facilitate provincial input into national policy making and other issues, provinces and territories enter into intergovernmental negotiations and agreements with the national government. This generates a style of governance called 'asymmetrical federalism' wherein provinces and territories have the option to opt out of particular portions of intergovernmental agreements. The goal of this system is to accommodate contentious differences between provinces and the national government. I will discuss the three main layers of the Canadian government as they pertain to climate change policy making.³ I begin with the federal level.

1.1.2 Canadian federal Government

The Canadian federal government is a parliamentary democracy comprised of three main branches – the legislative, executive, and judicial branches. The role of the legislative branch is

³ As outlined later in this chapter, the data analyzed in this dissertation pertain to the national political sphere. Thus, while national-provincial relationships are important for governance related to various issues including climate change, this is largely outside the scope of this dissertation. These details are provided here to provide a full picture of governance in Canada.

to democratically represent the electorate and make laws. The executive branch has the role of implementing these laws, while the judicial branch has the role of interpreting these laws and acting as an independent and impartial arbiter of the law. There are many complexities that shape the character, operation, and structure of these institutions, but this is the general structure of the Canadian federal government.

As with all parliamentary democracies, Canada's system is structured by something called 'responsible government' (Brooks, 2012), which encompasses some important elements. The first pertains to the executive. This branch is comprised of the Prime Minister and their cabinet. They are elected, require the ongoing confidence of the legislature in order to govern, and propose most laws (Brooks, 2012). The second pertains to members of the cabinet, and is called 'ministerial responsibility'. This describes the collective responsibility among cabinet ministers meant to generate solidarity and ensure public support for decisions made by the executive. Also, ministers are held responsible for the goings on within their respective ministries.

In terms of the legislature, Canada's is composed of an 'upper' house and a 'lower' house, called the Senate and the House of Commons, respectively. The strength of any legislature is largely dependent on levels of (a)symmetry and (in)congruence. (A)symmetry relates to the balance of formal power and legitimacy between the two houses, and (in)congruence relates to how representative each house is of other, usually territorial, units (Lijphart, 2012). The legislature in Canada is asymmetric because the Senate is appointed instead of elected (meaning the Senate is characterized by less democratic legitimacy) and has less formal power compared to the House of Commons (Mintz, Tossutti, & Dunn, 2014). The legislature is also incongruent; members of

the House of Commons (Members of Parliament, or MPs) are elected from geographic ridings that are defined largely by the size of the population, whereas senators are appointed to the Senate to act as representatives of particular regions (Mintz et al., 2014). For these reasons we can say that Canada has a medium-strength legislature (Mintz et al., 2014). This structure has important implications for how laws are made in Canada.

To become a law in Canada, every bill must be passed by both chambers and receive royal assent by the Governor General (Brooks, 2012). Bills can originate from either of the houses. Within each house, bills require a detailed examination by committee, a report stage, and must pass three readings (Brooks, 2012). Due to the asymmetry of Canada's legislature, Senators are not allowed to propose bills related to spending or raising money. They also cannot defeat any bills related to spending or raising money that originate from the House of Commons (Brooks, 2012).

Some examples of climate change-related national bills of this sort are those used in the sampling strategy described later in this chapter, in the methodology section. These are bills C-288 (the Kyoto Protocol Implementation Act, which received Royal Assent on June 22, 2007), C-311 (the Climate Change Accountability Act, which was defeated in the Senate in November 16, 2010), and C-377 (Climate Change Accountability Act, which was in its second reading in the Senate as of December 2021). All three originated in the House of Commons and went through the processes described above. I have outlined how laws are made in the Canadian government. However, international agreements and treaties follow a separate process.

1.1.3 International Agreements and Treaties

In Canada, agreeing to an international treaty requires different procedures than creating legislation. Since 2008 Canadian governments ‘table’ (or formally put forward for consideration) international agreements and treaties in the House of Commons for a period of twenty-one sitting days before ratification (Barnett, 2021). Moreover, any vote related to the tabled agreement or treaty is non-binding. This means there is no requirement that ratification involve implementing any actual legislation. MPs are free to bring bills to the House of Commons in support of such agreements and/or treaties however, such as was the case with bill C-288 related to the Kyoto Accord.

The text of bill C-288 laid out a proposal that Canada must, within 60 days of implementation of the bill if it had received Royal Assent, prepare a climate change plan that laid out in detail the measures to be undertaken in order to meet Canada’s obligations as laid out in the Kyoto Protocol. The bill would have mandated the climate change plan include details on such measures as a just transition for workers affected by the plan, emissions regulations and performance standards, market-based mechanisms related to emissions offsets or trading schemes, and details related to spending or other fiscal incentives to reduce emissions. As the first major international agreement concerning climate change, the Kyoto Accord provides an ideal starting point for better understanding the process of how Canada handles these agreements.

1.1.4 Kyoto Accord

The Kyoto Accord was negotiated in Kyoto, Japan in December of 1997. It codified the United Nations Framework Convention on Climate Change, and represented the first major international agreement committing its parties to reducing GHG emissions. In this agreement Canada's targets were to reduce GHG emissions by 6 per cent from 1990 levels between 2008 and 2012. The federal Liberal government at the time ratified the Accord in 2002, however, there was no detailed implementation plan, and very little progress toward emissions reductions was made (Harrison, 2007; Rabe, 2007). Shortly after this, a new Conservative government led by Stephen Harper was elected in 2006. This Harper government questioned the existence of human-caused climate change and halted efforts to fulfill the Kyoto commitments (Harrison, 2007), despite the Kyoto Protocol Implementation Act (Bill C-288) receiving Royal Assent in 2007. The federal Conservatives lost a last-minute effort to kill the bill ("Opposition Kyoto bill passes third reading," 2007), and once passed, Prime Minister Harper agreed to respect the passage of the bill, but argued the bill offered nothing for him to act on ("PM says he will 'respect' Kyoto bill," 2007). At the 2009 COP in Copenhagen the federal government signed the Copenhagen Accord, agreeing to reductions targets of 17% below 2005 levels by 2020, however, this target was missed, and emissions actually increased over this period. Eventually Canada also withdrew from the Kyoto Accord in 2012, making Canada the first country to do so (Stoddart & Tindall, 2015)

In 2015 the Harper Conservatives were defeated by a new Liberal government led by Prime Minister Justin Trudeau. This victory of the Liberal party over the Conservative party was due in no small part to a growing public recognition of the seriousness of climate change, and the need

to address it (Stoddart, Haluza-DeLay, & Tindall, 2016; Stoddart, Smith, & Tindall, 2016). The new Prime Minister spoke publicly about how his government represented a renewed commitment to tackling climate change while also growing the economy. He declared that “Canada is back” and “here to help” in the global effort to fight climate breakdown” (Carter, 2020, p. 3). Trudeau’s government promised to meet the recently announced G-20 climate commitments and eventually end subsidies for the fossil fuel industry in Canada. The Liberals won re-election with a minority government in 2019 and again in 2021 with another minority. As of December 2021, Canada continues to struggle in fulfilling G-20 commitments (Carter, 2020; MacNeil & Paterson, 2018; Masson-Delmotte et al., 2018), though it has made some progress in implementing a national carbon pricing scheme, called the Greenhouse Gas Pollution Pricing Act. This is one part of a broader landscape of climate change related policies put in place by the federal government.⁴ In terms of climate change policy, in this dissertation I focus on carbon pricing since I have data specifically on the perceptions that policy network actors have on carbon pricing (I also focus on perceptions on whether, in order to reduce GHG emissions, Canada should restrict mining and export of the oil sands or expand use of natural gas, both of which would be implicated in a national carbon pricing scheme). Thus, in the next section I detail this aspect of the federal government’s policy strategy.

⁴ Canada has enacted a number of other laws directed toward reducing GHG emissions beyond a carbon pricing scheme, such as making building codes more stringent, phasing out hydrofluorocarbons, making investments into a number of areas including clean power projects, production and use of low-carbon fuels, homeowner grants for energy efficiency upgrades and retrofits, and projects for planting trees and conserving or restoring portions of wetlands, grasslands, and species habitats (for more details, see <https://www.osler.com/en/resources/regulations/2015/carbon-ghg/canadian-government-carbon-and-greenhouse-gas-legi>.)

1.2 Carbon Pricing in Canada

Every province and territory in Canada has a price on carbon, whether it is through the federal carbon pricing scheme, a provincial carbon pricing scheme, or a combination of the two. The mechanisms of carbon pricing used in Canada fall generally under one of three types: carbon prices,⁵ baseline and credit systems (usually called emissions performance standards (EPS) or output-based pricing systems (OBPS)), and cap and trade systems.⁶ Carbon prices are regulatory prices applied to the consumption of fossil fuels like gasoline or liquified natural gas (LNG). An OBPS mechanism is a price on carbon emissions that is designed to act as an incentive for industries to reduce GHG emissions and encourage innovation, and to discourage industries moving facilities to regions without, or with lower, carbon pricing – a phenomenon known as carbon leakage. In a cap and trade system, governments set a ‘cap’ on the total amount of GHG emissions that can be released in a given industrial jurisdiction, and emissions that are within this cap are either distributed among industrial facilities or sold to them in an auction. Facilities that release fewer emissions than the amount they purchased or were allocated earn credits that they can then ‘trade’ (i.e. sell) to other facilities that release more emissions than their allocated or purchased carbon credits. As of December 2021, current prices on carbon in Canada range from as low as \$23/tonne in Quebec, to as high as \$45/tonne in British Columbia.⁷ Table 1.1 below

⁵ These are often referred to as carbon taxes, though legally these carbon prices are not considered to be taxes.

⁶ See <https://www.energyhub.org/carbon-pricing/> for a general summary of the three carbon pricing mechanisms. For information related specifically to the national carbon pricing scheme, see <https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work.html>.

⁷ See <https://www.energyhub.org/carbon-pricing/>.

summarizes carbon prices per tonne in all provinces and territories, and the mechanisms used to regulate fossil fuels and industrial emissions.

The federal pricing scheme in Canada is composed of two pricing mechanisms - a carbon price and an OBPS. The federal fuel charge in Canada began as a minimum price of \$20/tonne of CO₂ in 2019 and was set to rise by ten dollars every year to \$50/tonne in 2022. In December 2020, the Federal Government updated the pricing scheme, setting the annual price per tonne increase at fifteen dollars per year starting in 2023, reaching \$95/tonne in 2025 and \$170/tonne in 2030. As of December 2021, the current price on carbon in Canada is \$40/tonne. Though this pricing scheme is a national law, Table 1.1 shows how it only applies in certain parts of the country. As of December 2021, the federal carbon price currently only applies in Alberta, Manitoba, Saskatchewan, Ontario, Yukon, and Nunavut. The federal OBPS only applies fully in Manitoba, Prince Edward Island, Yukon and Nunavut, and partially in Saskatchewan. The provinces/territories exempt from all or part of either of the two portions of the federal pricing scheme have carbon pricing systems that meet some or all of the federal benchmark requirements.⁸

⁸ For a detailed explanation of how these exemptions are structured, see <https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work.html>.

Table 1.1 Summary of carbon prices in Canadian provinces and territories as of December 2021, and the mechanisms used to regulate emissions.⁹

Province/Territory	Carbon \$/tonne	Consumer emissions mechanism	Industrial emissions mechanism
British Columbia	\$45	Provincial carbon price	Provincial carbon price
Alberta	\$40	Federal carbon price	Provincial TIER*
Manitoba	\$40	Federal carbon price	Federal OBPS
Saskatchewan	\$40	Federal carbon price	Federal and Provincial OBPS
Ontario	\$40	Federal carbon price	Provincial EPS
Quebec	\$23	Provincial cap & trade	Provincial cap & trade
Newfoundland & Labrador	\$40	Provincial carbon price	Provincial EPS
New Brunswick	\$40	Provincial carbon price	Provincial OBPS
P.E.I.	\$40	Provincial carbon price	Federal OBPS
Nova Scotia	\$25	Provincial cap & trade	Provincial cap & trade
Yukon	\$40	Federal carbon price	Federal OBPS
Northwest Territories	\$30	Provincial carbon price	Provincial carbon price
Nunavut	\$40	Federal carbon price	Federal OBPS

* Alberta's Technology Innovation and Emissions Reduction (TIER) law is a type of baseline and credit system similar to an EPS or OBPS.

Three provinces – Alberta, Saskatchewan, and Ontario – challenged the constitutionality of the federal carbon pricing scheme in their respective provincial courts of appeal, with only the Alberta court of appeal finding the law unconstitutional. The case was then brought to the

⁹ This table is adapted from the summary diagram found at <https://www.energyhub.org/carbon-pricing/> accessed on December 24, 2021.

Supreme Court of Canada to determine whether the federal government had the authority to pass their carbon pricing law. The provinces argued they had some form of their own climate policies designed for their unique circumstances and that they had jurisdiction over their own natural resources. This second argument is in line with the principle of asymmetrical federalism outlined earlier in this chapter. The federal government countered that it had authority to pass laws addressing issues that are national in scope (i.e. that cross the borders of provinces and territories), and that climate change is one such national issue. They also argued that the law only applied in cases where provinces and territories didn't have sufficient pricing schemes in place – in other words, the federal law was a minimum carbon pricing standard. In March 2021 the court found the national carbon pricing law to be constitutional. The finding noted that climate change has impacts that go beyond provincial boundaries, and that this constitutes a matter of national concern that falls under the “peace, order and good government” clause of the Canadian Constitution.¹⁰

The discussion in this section has focused mainly on Canada's national government; however, as mentioned earlier, Canada uses a form of asymmetrical federalism. This gives provinces and territories a substantial amount of room to implement provincial/territorial laws (laws that apply within a province/territory only). As such, some provinces (and when they share the same interests, some regions that involve more than one province) play a significant role in Canada's climate change policy making landscape. For example, the discussion above about carbon

¹⁰ For a detailed summary of the Supreme Court case, see <https://www.scc-csc.ca/case-dossier/cb/2021/38663-38781-39116-eng.aspx> and <https://decisions.scc-csc.ca/scc-csc/scc-csc/en/item/18781/index.do>.

pricing outlines how national-provincial relationships can either help facilitate climate action (for those provinces that complied or went beyond the federal standards) or impede climate action (for example, the legal obstruction of the federal government's law from Alberta, Saskatchewan, and Ontario). I expand on this in the next section; however, it should be noted that a close analysis of federal-provincial policy making dynamics is outside the scope of the dissertation. The discussion of federal-provincial policy making is offered to provide a complete description of the policy making dynamics in Canada.

1.2.1 Provincial Climate Change Policy Making

Earlier I summarized the lackluster performance of the Canadian federal government in terms of climate change policy making. When we consider the provincial/regional level around the same timeframe (specifically from 2007 to 2008), there are some examples of significant climate change-related policy progress. During this time the provinces of British Columbia, Manitoba, Ontario, and Quebec became members of the Western Climate Initiative Regional Carbon Market (RCM) (Houle, Lachapelle, & Purdon, 2015). The RCM was originally established in 2007, and at its peak included eleven members – seven U.S. states (Arizona, California, New Mexico, Oregon, Washington, Montana, and Utah) and the four provinces already mentioned. The politics related to the RCM were 'turbulent' (Houle et al., 2015, p. 51) and many of its members ultimately dropped out (see Klinsky, 2013 for a detailed history of the RCM).

While still members of the RCM, the provinces of British Columbia and Quebec each passed a form of carbon pricing. British Columbia passed a carbon tax in October 2007, and Quebec passed a cap-and-trade scheme in July 2008. While the effectiveness of these laws in terms of

reducing gasoline consumption and behavioral responses of consumers is unclear (Erutku & Hildebrand, 2018),¹¹ these provincial laws represent significantly more progress toward climate change policy making compared to the federal government at the time. During the same time, Ontario and Manitoba did not pass any such legislation. Although British Columbia had implemented a carbon tax already, the province along with Ontario and Quebec announced intentions to present regulations related to the RCM in 2011, but none were produced by any of three provinces (Klinsky, 2013). Eventually only Ontario and Quebec remained committed to working with California to establish a carbon cap and trade scheme (as noted, Manitoba never got off the ground with participation in the RCM, and shortly after California announced their draft regulations in October 2010, British Columbia seemed to pull out of the RCM) (Klinsky, 2013).

While British Columbia and Quebec already had some form of carbon pricing scheme implemented, in late 2015 the Ontario Liberals – then led by Kathleen Wynne – announced their plans to introduce a cap and trade system as part of their participation in the RCM. This plan took effect in January of 2017 (Shum, 2016). This Liberal government was defeated in June 2018 by the current majority Conservative government led by Doug Ford. Four months after winning this election, in October 2018, the provincial Conservatives cancelled Ontario’s cap and

¹¹ For example the carbon tax in British Columbia initially led to a “statistically significant amplified behavioural response” (Erutku & Hildebrand, 2018, p. 131) in terms of reductions of gasoline consumption per-capita, but shortly after introduction, after April 2012, per-capita gasoline consumption began to increase. In July 2012 after the carbon tax peaked, “this amplified behavioural response faded away” (Erutku & Hildebrand, 2018, p. 131). Additionally, during this time British Columbia also implemented a “clean” electricity standard – one of the first in North America – which was estimated to reduce emissions by a much larger margin compared to the carbon tax (Rhodes & Jaccard, 2013).

trade plan (Lachapelle & Kiss, 2019; “Ontario government passes legislation to cancel cap-and-trade,” 2018). In addition, the government implemented a provincial EPS pricing scheme for industrial emissions. As of December 2021, Quebec and British Columbia are the only provincial members of the RCM that still have some form of carbon pricing developed within the program.

The province of Alberta has a similar history of flip-flopping on provincial carbon pricing schemes. In 2016 the provincial government, then led by NDP Premier Rachel Notley, engaged in an apparent quid-pro-quo with the federal government. The Alberta NDP agreed to support the federal government’s then-proposed national carbon pricing scheme in exchange for the federal government’s support for approval of various oil and LNG infrastructure projects in the province at the time, most notably the Kinder Morgan Trans-Mountain oil pipeline (“Premier Rachel Notley pulls Alberta out of federal climate plan over Trans Mountain ruling,” 2018).¹² The pipeline had become a controversial infrastructure project due to “an unprecedented wall of opposition from Indigenous communities, environmental organizations, the Governments of British Columbia and Quebec, and municipalities along the pipeline routes concerned about the environmental impacts of expanding oil development” (Carter, 2020, p. 4). However, this NDP government lost a provincial election in April 2019, and a new majority conservative government led by Jason Kenney took power and remains so as of December 2021. Similar to the fate of carbon pricing in Ontario, the new Alberta government scrapped all support for the

¹² See also then-Premiere Notley’s statement, here: <https://www.alberta.ca/release.cfm?xID=4352872321AAA-AAD1-19E7-3EB6D6C322902F0A>

federal carbon pricing scheme. Moreover, the Kenney government was eventually one of the three provinces that took the federal government to the Supreme Court over the law.

This discussion highlights how in Canada, the national energy strategy has been a focus of federal-provincial conflict for many years (Schirle, 2015). This is especially true with respect to Alberta. Tensions between the province and the federal government over energy strategy go back to the 1970s before climate change policy debates, as a result of the national energy plan of the Liberal federal government at that time (Granatstein & Bothwell, 1990; Pratt, 1982). The more recent politics surrounding the carbon pricing scheme that Canada implemented demonstrates how asymmetrical federalism can give rise to contentious policy making involving the federal and provincial governments. The national carbon pricing scheme was enacted amidst fierce opposition stemming mainly from some of the provinces who rely economically on fossil fuels – that is, Alberta under Jason Kenney’s leadership, Saskatchewan, and Newfoundland and Labrador (Carter, 2020), as well as Ontario (Lachapelle & Kiss, 2019) under Doug Ford’s leadership. In fact the scrapping of Ontario’s carbon pricing scheme by the Ford Conservative government represented a significant blow to climate change policy development in Canada (Lachapelle & Kiss, 2019). This underscores the complex interplay of the federal and provincial levels of policy making in Canada, and the importance of federal governments including regional considerations in any climate change policy project (Meadowcroft, 2016). Canada’s carbon pricing scheme is a positive development in climate change policy in Canada – as Table 1.1 summarizes, the pricing scheme ensures all provinces and territories meet a basic minimum of consumer and industrial carbon pricing. However, the Canadian federal government has historically had an ambivalent approach toward climate change policy.

1.2.2 Federal climate change policy

The approach of the federal Liberal government led by Justin Trudeau toward climate governance is seemingly contradictory: on one hand the Liberals have pursued some strategies for reducing GHG emissions through initiatives such as carbon pricing and international reduction targets.¹³ On the other hand, they have remained in favor of developing fossil fuels generally - and the Alberta oil sands especially - as an economic strategy (Carter, 2020; Carter & Zalik, 2016; MacNeil, 2019; MacNeil & Paterson, 2018; Schott, 2013). The apparent quid-pro-quo between the federal Liberals and the Alberta NDP government led by Rachel Notley summarized earlier exemplifies this contradictory approach. This approach represents “a fundamental and intensifying disjuncture between Canada’s economic policies and its environmental policies” (Carter, 2020, p. 3), and has earned the country a measure of international condemnation based on concerns about the impacts of the oil sands on climate change (Halidullin, 2018).

Another example of this was the Trudeau government’s purchase of the Kinder Morgan Trans-Mountain oil pipeline in 2019. The purchase was intended to ensure the viability of the pipeline’s expansion as an infrastructure project, and to avoid negative economic impacts that losing the project may have had on the oil industry in Canada. The purchase was heavily criticized by many actors including Indigenous communities, environmental organizations, some provincial

¹³ A recent development is the “Canadian Net-Zero Emissions Accountability Act” (Bill C-12) that received Royal Assent in June 2021. The bill sets out two requirements aimed at achieving net-zero emissions by 2050. It requires the Federal Government to (1) set national targets for reducing GHG emissions, and (2) establish a planning, reporting and assessment process.
(https://lop.parl.ca/sites/PublicWebsite/default/en_CA/ResearchPublications/LegislativeSummaries/432C12E)

governments, and some municipalities along the pipeline routes. These groups argued that the purchase of the pipeline and the expansion of oil production was bad for mitigation of climate change. They also argued that the pipeline posed a risk in that it would eventually leak oil. In response, the federal government argued that it was possible to balance expanding oil development while simultaneously dealing effectively with climate change and mitigating risk of pipeline leaks and spills. This is in essence an argument for ‘clean growth’, something that some climate researchers argue is not feasible with respect to fossil fuels (Carroll, Graham, & Shakespear, 2020). The purchase of the pipeline was approved less than a day after the House of Commons passed a motion declaring a national climate emergency (Carter, 2020).

But Justin Trudeau’s government is not the only one to exhibit this ambivalence toward climate change policy making. Canadian federal governments have been contemplating various forms of carbon pricing for over 30 years, with almost no movement on policy (Jaccard, 2016) save for the Trudeau government’s recent policy. While there have been some policies implemented at the provincial level that seek to address aspects of climate change as outlined above, overall, Canada’s performance in terms of climate change policy making remains poor. This is evidenced by the discussion above about Canada’s consistently low ranking on the CCPI, despite changes in federal governments.¹⁴

¹⁴ Some provinces have implemented additional policies beyond the carbon pricing in British Columbia, Ontario, and Quebec outlined in this chapter. For example, in 2007 Ontario released a plan called Go Green: Ontario’s Action Plan on Climate Change, which established some targets for reducing GHG emissions in the province, commitments related to annual reporting, and various regulations including the phasing out of coal fired power generation by Ontario Power Generation – a government-controlled organization that provides about half of Ontario’s power – and the implementation of incentives for buying or leasing electric vehicles and energy-efficient home upgrades/retrofits (Government of Ontario, 2007). Since the election of Doug Ford’s Conservative government in 2018, the province has withdrawn from the RCM, cancelled a number of the incentives in place, and introduced a new plan called A Made-In-Ontario Environmental Plan ([https://www.ontario.ca/page/made-in-ontario-](https://www.ontario.ca/page/made-in-ontario)

This summary highlights how climate change policy making in Canada is complex, involving a number of actors with a range of policy positions. At times this governance can become contentious involving social movement actors and other communities in opposition to policies and/or projects related to energy and climate change. In this dissertation I make the argument that one important dimension involved in understanding this complex process of policy making in Canada pertains to the social structures within which policy actors discuss and act upon their policy positions. These social structures – or *social networks* – engender particular micro-structural processes (processes that occur at the level of individual network actors) that are shaped by macro-level processes (that occur at the level of a whole network, or portion of a network). Moreover, these processes are related to political discourse and to the policy positions held by network actors. In the next section I summarize the substantive focus of the chapters that follow, and the literature within which this dissertation is couched.

1.3 Literature Review

In this dissertation I analyze five social networks related to climate change policy making in Canada, and climate change-related media coverage of the people involved in these networks. I draw primarily from the literature on social networks broadly - and from the literatures on political networks and discourse networks specifically. I also draw from the literature on social movements as it pertains to political networks. In Chapter Two I undertake a social network analysis of five Canadian climate change policy networks. I draw on the literatures related to

[environment-plan](#)) that as of December 2021 has not been successful in addressing GHG reductions (Crawley, 2021).

influence and subgroups within political networks to study how an actors' position within a political network may shape how influential they are in the policy sphere, or how central they are in a climate change policy network in Canada. In Chapter Three I draw from the literature on discourse networks as well as the sociology of social movements and political networks to study how media coverage of climate change issues affects how influential an environmental actor is perceived to be by other political network actors. In Chapter Four, I draw from the literature on network analysis utilizing Exponential Random Graph Models (ERGMs) – a class of network analysis that overcomes some of the dependency issues inherent in network observations – as well as the policy networks literature related to the Advocacy Coalition Framework (ACF) to analyze how factors internal to policy networks (micro-structural network effects) and those that are external to policy networks (the policy beliefs of network actors) combine to partly explain how particular policy networks arise. While there are a number of theories and frameworks that can be used to study policy networks, I use the ACF in this chapter since the framework speaks directly to mechanisms of tie formation in policy networks (Satoh, Gronow, & Ylä-Anttila, 2021; Weible & Sabatier, 2011), which is the focus of the chapter.

In the sections that follow, I describe foundational literature on social networks, with a focus on policy and discourse networks. There are many potential theories and frameworks that describe policy networks. Some commonly-used approaches are those related to the organizational state perspective (Laumann & Knoke, 1987), the epistemic communities approach (Adler & Haas, 1992), institutionalism (Ostrom, 2009), policy learning (Moyson, 2017; Moyson, Scholten, &

Weible, 2017),¹⁵ and the ACF. Although not relied upon in this dissertation, I describe the first four theoretical approaches here because they are major components of the policy network literature. However, I will prioritize discussing the ACF (Jenkins-Smith, Nohrstedt, Weible, & Sabatier, 2014; Sabatier & Jenkins-Smith, 1993; Weible & Cairney, 2018; Weible & Ingold, 2018; Weible & Jenkins-Smith, 2016) in this chapter, given that the framework is used in this dissertation.

In contrast to policy networks, the literature surrounding discourse networks is more recently developed and has increasingly been applied in policy analyses (Leifeld, 2013, 2017). In this literature, researchers focus on the role that media and the statements of policy actors play in the policy process (Leifeld, 2013, 2017). Literature on discourse networks dovetails well with particular aspects of the literature on social movements – specifically the role that media publicity plays in social activism (Russell et al., 2016; van Aelst, 2014). This is an important part of the discussion of Canadian climate policy because debates surrounding climate and energy in Canada “have triggered an unprecedented range of political conflict” (Carter, 2020, p. 5). This discussion will show that a discourse network analysis (DNA) approach is complimented by social movements literature; insights about the importance and efficacy of media coverage for social activists may depend, at least partly, on the network context within which activists are embedded. I now turn to the discussion of social network analysis.

¹⁵ Policy learning is also often referred to as social learning (Collins & Ison, 2009; Ensor & Harvey, 2015; Hall, 1993; Van Epp & Garside, 2019).

1.3.1 Social Networks

The first step in any theoretical discussion related to social networks is a clear definition of what social networks are and why we should study them. Generally, a social network can be defined as a set of social actors (such as individual people or organizations) that are called ‘actors’ or ‘nodes’ (Borgatti, Everett, & Johnson, 2013). These actors are embedded within a set of structured yet dynamic interrelations called network ‘ties’ (Borgatti, Brass, & Halgin, 2014; Borgatti & Halgin, 2011). Network actors and the network ties that connect them have characteristics or ‘attributes’ that distinguish one actor (or one network tie) from the others (Borgatti et al., 2013).

Social networks are “a way of thinking about social systems that focus our attention on the relationships among the entities that make up the system” (Borgatti et al., 2013, p. 1). Network analysts are particularly interested in how network ties interconnect through common actors. This creates “chains or paths of nodes and links” (Borgatti et al., 2013, p. 2) that indirectly connect network actors together. This web of connections is what network analysts consider to be a network. This mechanism of ‘indirect connection’ is a central insight of social networks. It provides a theoretical mechanism whereby “disparate parts of a system may affect each other” (Borgatti et al., 2013, p. 2). This means that social network data is not independent – observations about one actor in a network may be (and often are) associated with other actors in the network (Borgatti et al., 2013; Robins, Lewis, & Wang, 2012).¹⁶ The character of network

¹⁶ Researchers have developed a number of statistical approaches designed to deal with the dependence of network data, which violates assumptions of independence of cases required for traditional statistical techniques. I use some of these approaches in this dissertation, and discuss them where appropriate.

ties depends on the network and is largely defined by the researcher (Borgatti et al., 2014; Borgatti & Halgin, 2011). For example, ties in a friendship network represent two social actors who are friends, connected through a friendship tie. The networks analyzed here are related to climate change policy and are consequently referred to as policy networks.

1.3.2 Policy networks

Policy networks are a particular type of social network. A policy network contains actors within a set of social relations who interact with one another in the context of particular policy issues (Adam & Kriesi, 2007; Broadbent, 2017; Henry, 2011; Knoke, 2011; Ylä-Anttila et al., 2018). Pertinent types of actors involved in the policy networks studied in this dissertation include politicians, government bureaucrats, environmentalists, scientists, think tanks, business leaders, NGOs, and others. Actors can be organizations/institutions (as is the case here) or individual people (Laumann & Knoke, 1987; Ostrom, 1990, 2009). They can also be other entities such as themes within political discourses (Leifeld, 2013, 2017). Networks are often composed of ties among a set of actors, but may also be composed of ties between actors and other attributes – a network structure called a two-mode or bipartite network (Borgatti et al., 2013; Knoke & Yang, 2008). For example, in DNA (the study of political discourses using tools from social network analysis, which is expanded on later in this chapter), networks are often composed of ties between actors and the themes these actors are associated with in textual data (Leifeld, 2015, 2020). The attributes of actors included in the analyses below include the beliefs that network actors hold about particular policy proposals related to climate change in Canada, and attributes about climate change-related media coverage of these actors.

This dissertation is generally motivated by theoretical arguments that maintain that under certain conditions, policy networks can affect climate change debates, the positions that policy network actors hold about climate change policies, and ultimately climate change policy. Policy network analysis can shed light on the institutional, economic, and/or cultural mechanisms that shape informal policy making, and how they combine to produce national responses (Ylä-Anttila et al., 2018; see also Broadbent, 2017; Ingold, Fischer, & Cairney, 2017). It can help uncover “what organizations exert influence on policy making, what beliefs they carry, what kind of coalitions these organizations form to push for their agenda, how they are connected to state organizations and how their opponents are organized” (Ylä-Anttila et al., 2018). This brief summary of the utility of policy network analysis points us toward something that is central to understanding how social networks are implicated in political processes – mainly that social structure is related to social influence (Friedkin, 2015; Marsden & Friedkin, 1993).

1.3.3 Policy Network Analysis

Policy network analysis involves analyzing structural patterns of network ties among policy actors in a network, the micro-structural network related processes that shape the actions of actors within the network, and the role that policy related beliefs held by these actors play in these network processes (Adam & Kriesi, 2007; Henry, 2011; Henry, Lubell, & McCoy, 2011; Ingold & Fischer, 2014; Knoke, 2011; Matti & Sandström, 2011). Part of the goal of policy network analysis is to reveal which actors are influential and which are not, how these actors are connected in the network, and how the import these different patterns of connections have on processes of policy making (Ingold & Leifeld, 2016; Knoke, 1990; Leifeld & Schneider, 2012; Ylä-Anttila et al., 2018).

In general, much of the research done on policy networks has taken a what Burt (1987) describes as a relational approach. In this approach, actors are considered part of a subsection of a network because they interact with one another. In contrast, other work has taken what Burt (1987) describes as a positional or structural approach. In this approach, actors are considered part of a subsection of a network because of their similar patterns of ties to other network actors – in other words, they are ‘structurally equivalent’ (Burt, 1987; Tindall, Stoddart, & Howe, 2020). Importantly, in the context of climate change policy networks in Canada, structurally equivalent actors tend to have similar patterns of support for climate change policy positions as well (Tindall et al., 2020). This brief discussion of the link between structural position and support for policy positions hints at one of the central aspects of policy network analysis – the study of how social structure and social influence are related (Freeman, 1978; Friedkin, 2015; Ingold & Leifeld, 2016; Knoke, 1990; Laumann & Knoke, 1987; Marsden & Friedkin, 1993).

1.3.4 Social Structure and Social Influence

One important mechanism driving the effect network structure may have on outcomes of political processes is social influence, which is shaped by social structure (Freeman, 1978; Friedkin, 2015; Knoke, 1990; Lubell, Scholz, Berardo, & Robins, 2012; Marsden & Friedkin, 1993; Raab, 2002; Tindall, 2014; Wasserman & Faust, 1994). In terms of social structure, I am referring primarily to the patterns of network ties amongst network actors. This can include the existence of subgroups and their membership, micro-structural (tie-based) processes of tie formation, etc. (Borgatti et al., 2014; Borgatti & Halgin, 2011; Friedkin, 2015; Marsden & Friedkin, 1993).

Social influence is one of the key ways in which political power works in social networks (Tiziana Casciaro & Piskorski, 2005; Henry, 2011; Ingold & Fischer, 2014; Ingold & Leifeld, 2016; Stoddart, Mattoni, & McLevey, 2020; Stokman & Zeggelink, 1996). Social influence can occur in a number of ways, one of which is in a passive manner. Network actors may send out information not targeted in any specific way, and other network actors may receive this information and change their attitudes/opinions as a result (Friedkin, 2015; Marsden & Friedkin, 1993). This could be information about themselves or other actors, about particular policy issues or policy instruments, about their resource endowments or those of other actors, scientific knowledge, or other resources (Leifeld & Schneider, 2012). For example, this dissertation includes data on who the actors in the sample perceived to be influential in domestic policy making. It could be that actors perceived as influential are perceived as such because they are “sending out information” such as public information about their stock of resources (e.g. financial endowment, market capitalization, media presence/use by media as an authority on an issue, etc.), thus influencing their reputation as perceived by the other actors in the sample.

In social network research social influence is often conceptualized in terms of network centrality (Freeman, 1978), and specifically degree centrality - the sum of all incoming and outgoing network ties an actor has (Knoke & Yang, 2008). Social network theory holds that centrality within networks varies in meaningful ways and connotes meaningful differences. Heterogeneity in structural positions based in centrality measures can have significant implications for the sorts of influence processes outlined earlier. For example, one or some subset of actors with high centrality can be quite prominent (are connected to many other actors directly, and connected to many actors indirectly via short paths through adjacent actors) compared to other actors with

lower centrality (far fewer connections to other actors). These prominent actors can mobilize more influence than less central actors (Knoke, 1990; Lubell et al., 2012; Raab, 2002; Wasserman & Faust, 1994). For example, these actors can easily introduce key topics/ideas broadly into policy debates, thus shaping the debate in significant ways toward desired outcomes (Fisher, Waggle, & Jasny, 2015; Fisher, Waggle, & Leifeld, 2013; Kukkonen, Ylä-Anttila, & Broadbent, 2017; Kukkonen et al., 2018). This could be understood as a kind of informal structural power tied to the access an actor has to political influence (Ingold & Leifeld, 2016; Stokman & Zeggelink, 1996).

Thus, an actor's location in a network can provide valuable access to the rest of a network, forming a kind of structural resource. For example, in newly emerging policy domains patterns of network connections can shape the ability of network actors to identify ideologically similar peers, since actors "strongly [rely] on former contacts rather than shared ideologies or leadership" (Ingold et al., 2017, p. 442). One way of considering network structure as a resource is in terms of *social capital* – in this case, *structural* social capital (Tindall, 2014; Tindall & Wellman, 2001). Policy network actors often rely on existing network connections as a kind of social capital structure, to obtain information or advice to inform their own behavior (Festinger, 1950; Henry, 2011; Leifeld & Schneider, 2012; Malinick, Tindall, & Diani, 2013; Tindall et al., 2020). For example, Tindall et al. (2020) demonstrated that an actor's position in a Canadian climate change policy network is significantly associated with their support for the development of the Alberta oil sands, controlling for other climate change related beliefs and sectoral affiliation. In other words, network actors may come together into coalitions as a result of already being "structurally cohesive or equivalent" (Marsden & Friedkin, 1993, p. 133).

This kind of social capital structure can support processes related to “trust and norms of reciprocity” (Henry et al., 2011, p. 420) that strengthen cooperation amongst network actors (Coleman, 1994; Putnam, Leonardi, & Nonetti, 1994). These relations are important for building and maintaining advocacy coalitions. For example, Calanni et al. (2015) studied collaborative partnerships within aquaculture governance in the United States in 2009–2011. They found that professional competence and keeping promises, as well as access to expertise and influence outside the partnership, were more important for coordination than were shared beliefs. These aspects of coordination represent network-based processes related to trust and resource dependency, both of which are related to the structural location of network actors (Marsden & Friedkin, 1993).

As noted above, social influence could also be more deliberate; network actors commonly come to share some position or belief through the influence other network actors exert upon them through their network connections (Friedkin, 2015; Ingold & Leifeld, 2016; Lusher & Robins, 2013a; Marsden & Friedkin, 1993; Metz, Leifeld, & Ingold, 2018; Shalizi & Thomas, 2011; Tindall, 2014). For example, one of the networks I analyze in this dissertation is a communication network built on survey responses of policy network actors who were asked to indicate with whom they regularly communicated with. It is possible that some actors attempt to mobilize information (such as scientific information or social media campaign communications) in their communications with other actors in efforts to influence their stance on a particular policy orientation, or their support/opposition to a particular policy instrument.

This type of influence could also take the form of incentives or sanctions, such as promises of exchange or threats of retribution (Broadbent, 2017; Peters & Zittoun, 2016; Raab, 2002; Tindall, 2014). For example, an environmental organization may approach a political actor (such as a local representative) and offer their organization's support by way of mobilizing voters in support of the local representative, in exchange for that representative's support for a particular issue or policy of concern to the environmental organization. Or, the environmental organization may threaten to push voters against the representative unless they support the organization's position.

Influence may also occur through processes of diffusion. For example, one of the network relations used in this dissertation includes data about who network actors in the sample relied on as sources for expert scientific information. As actors access and share this information, it gets diffused through the network in particular ways, depending on the network structure (Friedkin, 2015; Marsden & Friedkin, 1993; Tindall, 2014).

As this discussion suggests, influence “does not require face-to-face interaction [or] deliberate or conscious attempts to modify actors' attitudes or behaviours” (Marsden & Friedkin, 1993, p. 128), although this is commonly how influence operates. In fact, the only requirement for social influence is “information [which allows social comparison] about the attitudes or behaviors of other actors” (Marsden & Friedkin, 1993, p. 128; see also Gartrell, 1987). Actors may compare themselves or their organization with others in the network, and sometimes these comparisons are based on actors' reputations, and their perceived influence in a policy network (Tindall et al., 2020).

This discussion highlights the fact that it can be difficult to empirically demonstrate/test processes of social influence operating in any specific network (Friedkin, 2015; Marsden & Friedkin, 1993). However, in this dissertation I operationalize social influence in terms of a ‘subjective evaluation’ (Gartrell, 1987) that policy network actors make about how influential other policy network actors are. The network data I analyze is based on survey responses to questions specifically about how influential survey respondents perceived other policy network actors to be. This understanding of influence is social-psychological – it is a subjective evaluation made in the process of social comparison that network actors make about other network actors (see Heaney & Lorenz, 2013, pp. 260–261, for a good summary of this approach). This represents a relatively novel approach to studying influence in policy networks and adds to our understanding of how social structure (networks) and policy influence are linked. Although this is not directly capturing network processes related to social influence in the structural sense outlined earlier in this section – that is, the processes whereby actors who are connected in a network become more similar with respect to their attitudes, opinions, and/or beliefs as a result of their network connections (Gremmen, Dijkstra, Steglich, & Veenstra, 2017; Marsden & Friedkin, 1993; Robins & Daraganova, 2013; Tindall, 2014) – it is a generally good representation of the distribution of influence in policy networks (Heaney & Lorenz, 2013). Another factor complicating the study the social influence is the phenomenon of social selection.

1.3.5 Social influence and Social Selection

Another predominant network mechanism that is often mobilized in theoretical explanations of networks is social selection (Gremmen et al., 2017; Kossinets & Watts, 2009; Lusher & Robins, 2013b; Tindall, 2014). Social selection is the process whereby actors find themselves aligned

with respect to their beliefs, attitudes, opinions, etc. and develop more ties amongst one another as a result of these similarities, than with network actors who hold opposing beliefs (Leifeld & Schneider, 2012; Mcpherson, Smith-Lovin, & Cook, 2001). This is based in a phenomenon called homophily, which is “the principle that a contact between similar people occurs at a higher rate than among dissimilar people” (Mcpherson et al., 2001, p. 416). For example, people often come to form connections with other people based on their shared beliefs, values, opinions, etc. related to religion, friendships, kinship, shared social statuses, race and ethnicity, sex and gender, age, education, occupation, and social class among others (Mcpherson et al., 2001). Of importance for this dissertation is homophily that involves attitudes/beliefs/opinions and network position/location (Mcpherson et al., 2001).

We can contrast the process of social selection with that of social influence outlined above. With social selection, actors with particular beliefs seek out and form ties to other actors who share similar beliefs. These ties are formed as a result of shared beliefs. With social influence, an actor shifts or develops their beliefs to be more consistent with the beliefs of the other actors they have pre-existing ties to. In other words, actors come to share the same beliefs as a result of social influence they are exposed to through their existing ties to other actors.

Many studies have demonstrated the presence of selection processes in networks from a range of contexts including within university communities (Kossinets & Watts, 2009; Lomi, Snijders, Steglich, & Torló, 2011) and elementary school groups (Gremmen et al., 2017; Lusher & Robins, 2013b), sports teams (Lusher & Robins, 2013b), medical researchers (Wang, Robins, Pattison, & Lazega, 2016), and in professional service firms (Rivera, 2012) among others. In

terms of political networks, research has demonstrated the role of homophily in structuring networks related to political influence (Heaney, 2014; Leifeld & Schneider, 2012), collaboration (Fischer & Sciarini, 2016; Ingold et al., 2017), and reputation (Fischer & Sciarini, 2015). In this process, network actors may engage in social comparison (Gartrell, 1987), contrasting their own policy beliefs with those of other actors that they view as important in some way in the policy sphere. For example in a study of fracking in Switzerland and the U.K. Ingold et al. (2017) found that in contexts of emerging policy issues, “[o]nly actors with the same left-green beliefs tend[ed] to agree on policy design” (p. 456). However, they found this was mostly an effect of mutual opposition to specific drilling projects.

Overall, social selection and social influence tend to occur simultaneously in social networks. As a result, it can be difficult to distinguish between them, especially in cross-sectional analyses such as those in this dissertation (Marsden & Friedkin, 1993; Shalizi & Thomas, 2011; Snijders, van de Bunt, & Steglich, 2010). However, both offer “competing explanations” (Marsden & Friedkin, 1993, p. 144) for observed network patterns. Therefore, one major theoretical consideration throughout this dissertation involves trying to better understand the different roles that social selection and social influence play in the formation of political network structure in the context of climate change policy networks in Canada. One way to deal with this tension is in the selection of a theoretical framework, because some of the most common frameworks used in policy network analysis are a better suited for explanations that make use of either social influence or social selection. I turn now to a discussion of these frameworks and explain why I make use of the ACF in this dissertation.

1.4 Common theoretical frameworks for policy network analysis

There are a number of theoretical frameworks analysts may use to analyze policy networks and the policy making process. In this section I will summarize the organizational state perspective, the institutional analysis framework, the epistemic communities approach, the social learning model, and the ACF. I highlight these particular theories as they tend to predominate in the literature on policy networks (Tindall, 2014).

1.4.1 The organizational state perspective

The organizational state perspective was developed by Laumann and Knoke (1987). This perspective focused on the participation of extra-governmental organizations (such as social movements, non-governmental organizations (NGOs), business associations, and scientific advisory bodies) in key events within the state-policy domains related to health and energy, and the processes by which this participation influenced policy decisions made by state organizations. Generally speaking, this perspective is a structural or positional one since the focus is on how policy decisions were shaped by social structure – namely, the network relations among governmental and extra-governmental actors. In terms of the selection versus influence question, we can say this approach is rooted in social influence.

Similar to how social influence is usually conceptualized, Laumann and Knoke (1987) argued the measure of policy influence an organization had was largely a result of its position in the policy network. However, this social structure was shaped by the choices made by organizations to strategically deploy their respective resources through participation in events. In addition to relations among organizations, these decisions also structured the relationships among events,

showing how network processes can impact the political context within which policy making occurs. These social structures were continually and strategically renegotiated by network actors to increase the amount of influence actors had on policy decisions (Laumann & Knoke, 1987).

This approach was one of the first systematic explorations of political networks and structural social influence and is valuable in demonstrating how network processes shape policy making. However, the analytical focus of this approach is limited to political events, and the involvement of network actors in these events. Another approach with similarities to the strategic choice of network relations described here, but with a broader range of application, is the institutional analysis framework.

1.4.2 Institutional Analysis

The institutional analysis framework is “a general language about how rules, physical and material conditions, and attributes of community affect the structure of action arenas [*or in the case of this dissertation, policy domains*], the incentives that individuals face, and the resulting outcomes” (Ostrom, 2007, p. 46). Generally, this framework holds that policy actors are rational actors that strategically seek out network connections to other actors to improve or maximize their individual outcomes by way of collective action (Ostrom, 2009). Therefore, we can say that this approach tends to favour social selection; however, social influence is involved as well, as this framework seeks to identify types of network relationships that may augment policy related outcomes for individual policy actors, or for the network as a whole.

This approach helps us understand how climate change can be viewed as a type of ‘common-pool resource’ problem. In these kinds of problems, social actors engage in behaviors that are rational in that they accrue short term benefits (for example, political actors who pursue particular policies to maintain a base of supporters), even though these behaviors may result in collective harm or destroy common resources (Stern, Dietz, & Ostrom, 2002). This can be seen in the environmental degradation as a result of economic policies in Canada based on the development of oil and LNG. However, this approach does not delve into the micro-structural network-related processes involved in these policy processes. One approach that touches on these sorts of processes is the epistemic communities approach.

1.4.3 Epistemic Communities

In the epistemic communities approach, the focus is on social networks of experts, often from different disciplines – called epistemic communities – who “produce policy-relevant knowledge” (Dunlop, 2013, p. 229) about complicated policy issues. This approach seeks to explain how these communities perceive such issues, and how they construct knowledge about them in conditions of uncertainty due to the sheer complexity of the problem(s) at hand (Adler & Haas, 1992). Epistemic communities are thus able to control and shape how complicated cause-and-effect information about policy issues gets distributed throughout the network. In this way, they can influence how other network actors perceive the issue, and the desirability or feasibility of available policy options to deal with the issue (Dunlop, 2013). This approach involves processes related to sharing of information, and influencing the perceptions of others, that are well described in the discussion above about social influence.

This approach “highlights the importance of actors that are able to define complex problems, particularly in the early policy design stages of the policy cycle where the uncertainty of novel policy problems is at its peak” (Dunlop, 2013, p. 230). However, social network literature related to social influence suggests that it is possible that policy actors do not learn about policy issues only, or even primarily, from epistemic communities. Moreover, climate change can hardly be said to be ‘*in the early policy design stages of the policy cycle*’. As such, this approach offers limited utility in examining contemporary climate change policy networks in Canada. Another approach that offers potential explanations at various stages of the policy process is the policy learning approach.

1.4.4 Policy (or social) learning

Policy learning (or social learning) is an approach that seeks to describe the social processes related to learning (Collins & Ison, 2009; Ensor & Harvey, 2015; Hall, 1993; Van Epp & Garside, 2019). Some key components of this general approach are the assumptions that the consequences of previous policies have a strong influence on policy learning, and that expert actors are important agents in the progression of policy learning (Hall, 1993).

Similarly, the policy learning approach seeks to describe the processes through which policy actors learn about policies, and how different policy contexts shape policy learning. It also seeks to describe which actors play important roles in the process, and often, how actors change their policy beliefs. Thus, many studies of policy learning make use of the ACF (Albright, 2011; Anderson & Maclean, 2015; Koebele, 2019; Kröger, 2005; Lauber & Brown, 2006; Lertzman, Rayner, & Wilson, 1996; Moyson, 2017; Moyson et al., 2017; Sabatier & Jenkins-Smith, 1993),

given that a main focus of the ACF is the policy beliefs that policy actors hold, and how these are related to the kinds of coalitions these actors enter into.

1.4.5 The advocacy coalition framework

The Advocacy Coalition Framework (ACF) suggests that actors who share similar values and beliefs related to particular policy issues tend to organize into groups called advocacy coalitions, (Sabatier & Jenkins-Smith, 1993). Advocacy coalitions are stable groups of network actors involved in policy making processes who are usually affiliated with organizations, and whom join into alliances with other network actors based on their shared beliefs related to policies, or shared preferences related to specific policy instruments. These coalitions then proceed to advocate or lobby for policies that reflect their shared beliefs or preferences (Gronow & Ylä-Anttila, 2016; Jenkins-Smith, Nohrstedt, et al., 2014; Weible & Ingold, 2018). This means that the ACF primarily makes use of a social selection argument.

The ACF emphasizes how beliefs of policy actors form the basis of coalition formation and how these beliefs ultimately get expressed through policy formation (Jenkins-Smith et al., 2014; Jenkins-Smith, Silva, Gupta, & Ripberger, 2014; Matti & Sandström, 2011; Weible & Cairney, 2018; Weible & Jenkins-Smith, 2016; Weible & Sabatier, 2011). This belief-centered approach is particularly well suited to the data analyzed in this dissertation, given that participants were asked about their positions on particular policy proposals and policy stances in Canada.

Moreover, the ACF lends itself well to applications of social network analyses, and has been recently included in a number of policy network-related analyses (for e.g. see Kukkonen et al., 2017, 2018b; Wagner & Ylä-Anttila, 2018; Weible, 2018). One reason for this is because, as

outlined earlier, the ACF is easily applied to network-related analyses. This is because the framework is partly based on assumptions about social network-related mechanisms of tie formation, such as social selection (Sato et al., 2021; Weible & Sabatier, 2011). For these reasons, this approach is used in this dissertation. Additional details about the ACF are provided in Chapter Four, including a detailed explanation of the context within which coalitions are embedded (called policy subsystems) and the three-tiered structure for beliefs that coalition members may hold (Jenkins-Smith et al., 2014).

Taken together, these approaches centre the role actors play in the policy making process, including processes of social influence and social section, and how these processes impact policy decisions (Knoke, 1990; Lubell, Scholz, Berardo, & Robins, 2012). In addition to political actors, social movement actors can also affect policy options and decisions. The next section introduces relevant literature related to social movements. One important aspect in studying climate change policy making not fully considered by the approaches outlined earlier is the kinds of political discourses that are produced by/within, and that shape, policy networks. I discuss this in the next section as well.

1.5 Social Movements and Discourse Networks

In Canada, the current state of climate politics as they relate to social movements is quite contentious (Carter, 2020). Ongoing debates about the country's energy strategy, economy, and climate future have given rise to "an un-precedented range of political conflict" (Carter, 2020, p. 5). Some of this conflict has been summarized above, including contention over the Trans Mountain Pipeline, and the court battles related to the federal carbon pricing scheme.

Substantively, much of the contention surrounding these issues relates to the risk of pollution, such as the potential of oil spills along the west coast of Canada posed by the Trans Mountain Pipeline expansion (Hoberg, 2013). Some of the contention also relates to issues surrounding colonialism in Canada, Indigenous lands and informed consent (Barker, 2015; Carter, 2020; Kay, 2006). Some of the contention relates to the divisions of power between provincial and federal governments. Given the various domains of political contention surrounding climate change in Canada, it is no surprise that some of the actors in climate change policy networks in Canada are those involved in social movements.

One of the most prominent methods to mobilize the public that is employed by social movement actors is the use of media attention, and the strategic ‘framing’ of particular events or policy issues in such a way as to elicit support from the general public for the social movement (Benford & Snow, 2000; Howe & Wilkes, 2018; Snow, Rochford, Worden, & Benford, 1986). The literature on framing is situated within a larger literature of social movements. Similar to the literature on political networks, there are some dominant theoretical approaches in the social movements literature. In general, scholars of social movements tend to emphasize the important role of three factors. These factors are: (1) the range of political opportunities and constraints that are available to emerging social movements; (2) the organizational infrastructures, or ‘mobilizing structures’, that are available to movements to use as vehicles for mobilizing people; (3) the use of media attention and framing (McAdam, 2017; McAdam, McCarthy, & Zald, 2012). I will briefly summarize the first two factors, but I focus on framing in this dissertation given that the social movements-related analysis in Chapter Three focuses on media discourse.

The first factor – political opportunities – involves understanding how overarching structural and institutional contexts within which social movements emerge and operate have significant impacts on the development and potential outcome(s) of social movements (Meyer, 2004; Meyer & Minkoff, 2004). One of the most comprehensive examples of this factor is Doug McAdam's (1982) work on the development of the civil rights movement in the United States. In this study McAdam argued that civil rights activism developed when external/overarching context facilitated this mobilization by bringing political attention to the issue. These contexts included the collapse of the cotton economy, the migration of African Americans from the southern United States to the northern United States, and the declaration by the Supreme Court of racial segregation in public schools as unconstitutional. This had the effect of reducing the political risk/cost for organizations and institutions of supporting civil rights, and at the same time increasing the political value of African Americans as a new base of potential voters (McAdam, 1982). In terms of the climate change policy context in Canada, some factors shaping the range of political opportunities include the change in federal and provincial governments, and the Supreme Court ruling about the constitutionality of the federal carbon pricing scheme summarized earlier in the chapter.

The second factor – mobilizing structures – involves understanding how social movements take advantage of favourable political opportunities to organize and mobilize the public. These structures are “collective vehicles, informal as well as formal, through which people mobilize and engage in collective action” (McAdam et al., 2012, p. 3). In the case of the civil rights movement, these structures included the networks of African American groups and churches across the country. One way that organizations and institutions can advance social movements is

through the mobilization of resources necessary for engaging in social movement activities, such as money, labour, space and infrastructure, access to media, etc. (McCarthy & Zald, 1977). Much research has been done on the role of formal and informal mobilizing structures in the development of the Canadian environmental movement (Dalton, Recchia, & Rohrschneider, 2003; Doyle, Elliot, & Tindall, 1997; Stoddart & Tindall, 2010; Tindall, 2002, 2004).

The third factor – framing – forms part of the theoretical context for Chapter Three. Framing is the process whereby social movement actors seek out media attention and engage in strategic ‘framing’ of particular events or policy issues to try to shape how the public understands of these issues, and to garner support from the public. Framing is a communication process – it is an “active, processual phenomenon that implies agency and contention at the level of reality construction” (Benford & Snow, 2000, p. 614) that makes us of frames.¹⁷

Frames are interpretive frameworks that people use to help them interpret reality (Benford & Snow, 2000; Snow et al., 1986; Taylor, 2000).¹⁸ For example, development of the oil sands in Alberta or the expansion of logging in British Columbia can be framed as a job-creating economic action plan on one hand, or as an environmentally damaging resource extraction

¹⁷ The framing process may involve any or all of three core framing tasks – (1) diagnostic framing; (2) prognostic framing; (3) motivational framing – and may make use of any or all of four core framing processes: (1) frame amplification; (2) frame bridging; (3) frame extension; (4) frame transformation (Benford & Snow, 2000; Snow et al., 1986; Taylor, 2000). For an example of how these tasks and processes may be applied to environmental activism in Canada, see Howe & Wilkes (2018, p. 254).

¹⁸ In terms of social movements there are generally two types of frames – master frames and collective action frames (Benford, 2013). Master frames relate to general principles not specific to any particular context or situation, such as the notion of justice, equal rights and opportunities, or other notions of good and evil (Benford, 2013). In contrast, collective action frames draw from principles within master frames to articulate interpretations of specific issues or situations, such as the collective action frame of environmental justice (Benford, 2013).

project on the other (Cormier & Tindall, 2005; Doyle et al., 1997; Howe & Wilkes, 2018).

Frames are used in the process of framing, which encompasses the rhetorical and communication strategies that social movement actors use in their efforts to shape how others understand political issues (Benford & Snow, 2000; Howe & Wilkes, 2018).

To study frames and the framing process, scholars study how activists identify the cause of an issue or the party responsible for creating the issue, the parties who will be negatively impacted as a result of the issue, and a proposed solution for remedying the issue (Benford & Snow, 2000). Then, scholars analyze how social movement actors mobilize these frames in the framing process (Benford & Snow, 2000; Cormier & Tindall, 2005; Corrigan-Brown, 2016; Doyle et al., 1997; Howe & Wilkes, 2018; Stoddart, Ramos, & Tindall, 2015). This process happens, among other ways, in news media (Benford & Snow, 2000; Cormier & Tindall, 2005; Corrigan-Brown, 2016; Howe & Wilkes, 2018; Stoddart et al., 2015). In Canada an important subset of this literature involves analyses specific to how activism by Indigenous peoples has been framed in Canadian media (Corrigan-Brown & Wilkes, 2012; Wilkes, Corrigan-Brown, & Myers, 2010; Wilkes, Corrigan-Brown, & Ricard, 2010).

With this discussion of framing in mind we can consider relevant insights from the literature on the relationship between media and policy from the fields of agenda setting (van Aelst, 2014; Vliegenthart, Walgrave, Baumgartner, et al., 2016a; Vliegenthart, Walgrave, Wouters, et al., 2016; Walgrave & Vliegenthart, 2012), policy networks (Kukkonen et al., 2018), and social movements (Gamson, 2007; Malinick et al., 2013; Meyer & Minkoff, 2004). One such insight is the suggestion that the more media coverage social movement actors are able to garner, the more

influential they should be perceived by other actors in the policy sphere. Social movement actors in particular have strong incentives to pursue this strategy as compared to, say, industry actors, since social movement actors are primarily operating outside of the prevailing status-quo institutional and political context (Fogarty, 2011; Grant, 2004), and thus have fewer resources compared to more institutionalized actors (McAdam et al., 2012; McCarthy & Zald, 1977). Thus, social movement actors heavily rely on media coverage to “reach bystander publics and put pressure on governments” (Stoddart, Tindall, Smith, & Haluza-Delay, 2017, p. 386; see also Vliegenthart, Walgrave, Baumgartner, et al., 2016; Vliegenthart, Walgrave, Wouters, et al., 2016; Walgrave & Vliegenthart, 2012). One method of empirically analyzing this process is through DNA discussed in the next section.

1.5.1 Discourse network analysis

Whereas policy networks are composed of structured relationships among policy actors, discourse networks are composed of structured relationships between actors and themes that occur within particular discourses. These discourses involve “verbal interactions between political actors about a given policy” (Leifeld, 2017, p. 302) and can include various types of actors engaging in public statements about stance on/beliefs about particular policies, or their preferred policy instruments (Leifeld, 2017). Social movement actors are often participants in these discourses. DNA involves studying these discourses using the tools of social network analysis. The DNA approach uses texts as a source of data for systematically measuring network actors’ policy beliefs and discourses (Leifeld, 2020). The data from these texts are used to generate networks that can be analyzed with the same methods used for studying policy networks. This makes it possible to jointly analyze what Leifeld (2020) calls “material policy

networks (the ‘coordination layer’) and ideational networks among the same actors (the ‘discursive layer’ or belief layer of subsystem, politics)” (Leifeld, 2020, p. 180). In other words, DNA makes it possible to study how political discourse is related to policy networks.

DNA has been used along with inferential network statistics to “identify the micro-level mechanisms by which actors contribute concepts to the debate” (Leifeld, 2020, p. 181). For example actors may learn about concepts used in debates from other actors involved in them (a form of social influence) (Leifeld, 2020). Actors may also be driven to use particular concepts or discourses in order to maintain self-consistency (Leifeld, 2020).

Leifeld (2013) and Leifeld and Haunss (2012) have suggested that DNA can also be used to study the interplay between discourse networks and coordination networks. Other contributions include the application of DNA to such problems as the mechanisms related to the science-policy interface (Kukkonen & Ylä-Anttila, 2020), the differences among political parties in climate debates (Ghini & Steiner, 2020), comparing types of solidarity in the public sphere (Wallaschek, Starke, & Brüning, 2020), party unity among legislators (Bhattacharya, 2020), nationalist discourses and discursive coalitions (Abzianidze, 2020), the link between discourse and public opinion (Rinscheid, 2020), the link between domestic policy discourse and developments in national and international policy (Kammerer & Ingold, 2021), comparing coalition structures and actor membership between policy networks and discourse networks (Schaub & Metz, 2020), and analyzing levels of stability/change in policy discourse (Kammerer & Ingold, 2021), among others.

With respect to climate change, DNA has been used to study climate change discourses in Canadian news media. For example, Stoddart, Smith and Tindall (2016) used a DNA approach to study social movement activism during the 2015 COP climate meeting in Copenhagen. Activists used the 2015 COP as an opportunity to challenge Canada's international reputation as a climate leader, re-framing the discourse to focus on Canada's poor climate change performance. Similarly Stoddart et al. (2017) used a DNA approach to analyze the link between media visibility of climate change policy actors, and the impacts media visibility had on the effectiveness of the advocacy of these actors. They found that environmental organizations had high levels of media visibility but were not very effective in their advocacy in terms of policy outcomes. In contrast, fossil fuel corporations were absent from media coverage of climate discussions but had their policy preferences reflected in policy outcomes. In this dissertation I build on Stoddart et al.'s (2017) work, extending it to incorporate an empirical analysis of perceived policy influence of actors in a Canadian climate change policy network.

1.5.2 Summary of literature review

This review of the literature introduced a number of bodies of literature. Before I move to a discussion of methods, I want to tie together the threads of this literature review for the reader. I began with a discussion of social networks, and how a social network approach centres the relational social structure within which actors are embedded. I discussed how one particular aspect of social networks literature focuses on policy networks, which are comprised of policy related actors interacting on the basis of policy issues. I extended the discussion of social network analysis by outlining how policy network analysis focuses on the various mechanisms (for e.g. institutional, economic, and socio-cultural) that shape policy making. Moreover, policy

network analysis is particularly well suited for examining relations among state and non-state actors, making this kind of analysis well suited to this dissertation, which focusses on state and non-state actors involved in climate change policy making in Canada. For example, policy network analysis can uncover which actors are influential, the policy beliefs of network actors, and how these actors are organized into groups.

I then summarized how all network analyses need to address the tensions between processes of social influence and social selection, which both occur in social networks of all kinds in some capacity. Both of these processes are related to social structure in policy networks. Social influence can be moderated by the patterns of social network connections actors are embedded within. Also, social-psychological understandings of perceived policy influence at least partly depend on social structure, since an actor may have more information about actors they are connected to (and less information about those they are not connected to), which may impact an actor's perception of the influence other actors' have. In contrast, social selection can partly shape social structure because people with similar policy beliefs often tend to come together into groups that structure policy networks.

I then discussed how there are a number of theoretical approaches that have been used to study policy networks, and summarized five of the more dominant ones – these are the organizational state perspective, the institutional analysis approach, the epistemic communities approach, policy (or social) learning, and the ACF. I argued the ACF is particularly well suited to the data analyzed in this dissertation given the framework centres beliefs of policy actors, which I have

data on. Moreover, the ACF is well suited to social network analyses because it is partly based on assumptions about social network-related mechanisms of tie formation.

Next I discussed how the political discourses that policy networks engage in are another important facet of studying policy networks and the policy making process, especially when researchers are interested in studying social movements. One core component involves understanding how social movements frame political issues in media. I summarized how researchers can use network analysis tools to study these discourses, and how actors' participation in discourse is related to their position within policy networks.

Throughout this discussion I have made references to methods of social network analysis I employ in this dissertation. More detailed explanations of each of these methods appear in the chapters within which they are used, in an effort to keep the repetition characteristic of sandwich-type dissertations to a reasonable level. In the next section I provide some substantive information about the data analyzed in this dissertation and sampling strategy used to gather the data.

1.6 Methods

In the analytical chapters that follow, I explain relevant methodological details and analytical strategies for each analysis. In this section, I will summarize the main data and sampling related methodological details that relate to all of the analytical chapters. I start with a summary of the broader international project of which this dissertation is a part of.

1.6.1 International COMPON project

The research presented in this dissertation is associated with a larger international project referred to as COMPON, which stands for Comparing Climate Change Policy Networks. The policy network approach pursued in this project was originally developed by Laumann and Knoke (1987), and Knoke et al. (1996).

This larger international project was initiated and originally led by Dr. Jeffrey Broadbent (of the University of Minnesota) and Dr. Dana Fisher (of the University of Maryland; formerly of Columbia University). Broadbent and Fisher obtained an NSF grant from 2008-2012, which helped support a number of activities related to the international aspects of the project, including the survey design workshop described below. Around 2012, the administrative leadership of the international aspects of the COMPON project were taken over by scholars at the University of Helsinki: Dr. Tuomas Ylä-Anttila, and Dr. Antti Gronow.

A key assumption of the larger COMPON project is that researchers can learn something about climate change policy making by studying the relations amongst actors in climate change policy networks. Similarly, insights can be gained about the discourse regarding climate change and climate change policy making, by studying discourse in the media about climate change, and related discourse networks (see discussion about discourse in section 1.5 above). The intent of the larger project is to promote comparative analyses of climate change policy networks. Some illustrations of this objective are discussed in Ylä-Anttila et al. (2018).

Early 2007 marked the beginnings of the COMPON project, when Jeffrey Broadbent hosted a two-day conference around the idea of the research project at the University of Minnesota with a variety of invited speakers. Dr. Tindall was a participant in this conference. A number of participants in this conference, as well as some newcomers, met at the annual meetings of the International Network for Social Network Analysis in Corfu, Greece (the Sunbelt Social Network Conference) in mid 2007. Here, there was a discussion of which country teams would be involved in the project, as well as some initial discussions of methodological issues. Both Drs. Tindall and Stoddart attended this meeting.

In 2010, a workshop (attended by Dr. Tindall) was held in Paris, France amongst the potential COMPON team countries to finalize a common version of the COMPON survey. One of the key participants in this meeting was Marcus Carson, who was the Co-PI for the Sweden case, and whose team had developed and administered an early version of the questionnaire. (Drs. Carson, Broadbent, and Fisher all ended up as research collaborators on the Canada climate change policy network SSHRC grant).

There have also been a number of other workshops and other meetings in other locations, as well as in virtual/hybrid format, where team members discussed methodological issues, potential analyses, writing projects, and new initiatives. Meetings have been held in various international locations as the larger project is an international project, but meetings have also been held virtually (starting long before the SARS-Cov-2 pandemic), and in hybrid format. While there have been some standalone meetings, the COMPON team has often tried to ‘piggyback’ onto

other existing meetings such as the International Sociology Association World Congress, and the Sunbelt Social Network Conference (amongst others).

1.6.2 Canada COMPON project

The Canada COMPON case research team has been led by Dr. David Tindall and Dr. Mark C.J. Stoddart. In 2011, the team received a SSHRC Research Grant (Tindall PI, Stoddart Co-PI) for the policy network component of the project, and also a SSHRC Insight Development Grant (Stoddart PI, Tindall Co-PI) for the DNA component of the project.

A common media sampling and analysis protocol was developed and applied across COMPON teams and was adopted for the Canada COMPON case. This protocol involved approaching media from four different levels: (1) quantitative news share analysis; (2) thematic analysis (for e.g. see Stoddart, Haluza-DeLay, & Tindall, 2016), (3) DNA (for e.g. see Stoddart & Tindall, 2015; Stoddart, Tindall, Smith, & Haluza-Delay, 2017); (4) a more open and inductive phase of analysis using NVivo¹⁹ (for example see Stoddart & Smith, 2016). Much of the coding and data analysis for the DNA component of the Canadian study, however, was inductive. This work was led by Dr. Stoddart with the help of graduate research assistants, and was important for some aspects of the of the development of the policy network project research design.

¹⁹ Nvivo is a suite of software designed for collecting and analysing textual and visual data using mainly qualitative, but also some quantitate, methods. For more information see <https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home/>.

The methodology for the discourse analysis for the Canada COMPON case are described in Stoddart & Tindall (2015), and in this chapter as well. Some methodological details are also provided in Chapter Three of this dissertation. This approach draws heavily upon methodological insights, and software, developed by Dr. Philip Leifeld (see Leifeld, 2015). An example of a comparative perspective to DNA concerning climate change policy is provided in Broadbent et al. (2016).

Dr. Tindall led the development of the interview schedule (see Appendix A), and the online survey questionnaire (see Appendix B), for the policy network component of the Canadian case. While the common COMPON questionnaire developed at the Paris workshop served as a basis for the Canadian online survey, Drs. Tindall and Stoddart, and their research assistants added a considerable number of new questions (including some additional network relation questions), and ‘Canadianized’ aspects of the questionnaire, by tailoring some questions to issues and policies of relevance to Canada. For example in Canada, the oil and gas and resource extraction sectors generally, and the forestry industries in British Columbia and Quebec, and oil sands in Alberta specifically (including various related infrastructure projects) are central to climate change policy making in Canada, and form the main backdrop for environmental movement activities (Carter, 2020; Hirsch, 2020; Tindall & Piggot, 2015; Tindall & Robinson, 2017). Also, the network roster was Canadianized with climate change policy actors identified (partly through media analysis) who were active in the Canadian climate change policy network.

Dr. Tindall, along with input from Dr. Stoddart, and with support from several research assistants, led the pre-testing of the interview schedule and questionnaire. Georgia Piggot, an

R.A. on the project, played a key role in helping to develop and coordinate several aspects of the policy network project (under Dr. Tindall's supervision), including comparing and coordinating information between the Canada teams and several of the other country teams, and facilitating the development of the sampling strategy. This involved building on the standard COMPON sampling protocol. The standard protocol made use of the media analysis results to construct the survey sample. This protocol makes some assumptions about how representative media discourses is of policy networks, which is itself a question that can be empirically studied.

For the Canada case, the sample began being built from the media analysis, but was subsequently triangulated with other secondary sources (outlined below) resulting in a survey sample that was broader than what would have resulted from the media analysis alone. R.A.s Noelani Dubeta and Gabriella Schittecatte worked on identifying representatives for the interviews and surveys (based on the sampling strategy, and sampling frame of organizations), scheduled interviews, sent invites to the respondents to complete the survey, and tracked the completion of these tasks. Some aspect of the survey questionnaire methodology are described in Tindall et al. (2020). While the ultimate aims of the COMPON projects are to undertake comparative analyses, the Canada climate change policy network project has thus far focused on domestic policies and actors, and this is also the case for this dissertation. Some comparative analyses have been undertaken comparing discourse network data from the Canada case, however (Broadbent et al. 2016)

1.6.3 Sampling frame: number of organizations

There were 110 organizations in the final sampling frame for the questionnaire survey. Some details about the composition of the sampling frame are given in several places in this dissertation. They are also described in Tindall et al. (2020).

1.6.4 Interviews

The Canada COMPON case included a component with structured open-ended interviews with representative of organizations involved in climate change policy making. These interviews generally took between 30 minutes and one hour. (Though some were shorter, and some were longer.) This qualitative component is relatively unique in the context of the larger COMPON project, which focused primarily on data collected through a closed ended questionnaire.

Seventy-seven interviews were completed in total, with representatives of organizations across Canada. Thus, the response rate for the completed interviews (77) relative to the number of organizations in the sampling frame (N=110) was 70%. Most of the interviews were conducted in 2015. The first interview was conducted on February 3rd, 2015. The final interview was conducted on June 30th, 2016.²⁰ While most of the interviews were conducted over the telephone, a small number were conducted face to face (about a dozen), usually in the offices of the organization that the respondent represented. Also, a few people were interviewed via Skype. Most interviews were conducted in English, but one interview was conducted in French.

²⁰ 73 of the interviews were conducted between Feb 3rd, 2015 and June 30th, 2015. The remaining 4 interviews were conducted between May 26th and June 30th, 2015. These latter interviewees had been unavailable earlier.

Gabriella Schittecatte (who is fluently bilingual) conducted and transcribed the interview, and translated it into English. Several other bilingual respondents were offered the opportunity to complete the interview in either English or French, but they opted to complete it in English. The majority of the interviews were conducted by Dr. Tindall, but a number were also conducted by Dr. Stoddart, and by Gabriella Schittecatte. One interview was completed by Noelani Dubeta.

The interviews were verbatim transcribed by research assistants. The transcriptions were imported into NVivo, and were thematically coded by several members of the research team (including Adam Howe). The research team's experience from the interview phase of the project helped to inform the development of the Canada case survey questionnaire. These qualitative data have also been used in several analyses and writing projects, including in this dissertation.

1.6.5 Survey questionnaire

The online survey questionnaire was programmed using Fluid Surveys,²¹ and was initiated on June 2015. Respondents who completed the interview earlier than June 15th, 2015, were invited to complete the questionnaire at a later date. People who were interviewed after June 15th, 2015, were asked to complete the questionnaire shortly after their interview. The online questionnaire survey component of the Canadian project was open from June 15th, 2016 (with the first 10 surveys received on that date) until December 31st, 2016. The last survey was received on

²¹ Fluid Surveys has since been rebranded as Survey Monkey (see <https://www.surveymonkey.com/mp/fluidsurveys-powered-by-surveymonkey/>)

October 13th, 2016. Paralleling the data collection for the interviews, all but three of the questionnaires were completed in 2015.

A total of 59 respondents completed all or part of the questionnaire, and 44 respondents completed the entire questionnaire. Generally, those who did not finish the questionnaire, completed the three sections of the questionnaire that appeared prior to the network questions. The research team has speculated (based in part on feedback) that those who did not complete the network questions, did not, likely because it was perceived as requiring much work (consistent with the literature about survey research), or that they were concerned about privacy/anonymity. Also, two of the 15 respondents who completed part of the questionnaire asked us to remove their questionnaire data. In one case, the respondent informed us that this was because of privacy concerns, and relatedly, the hostile climate around climate change politics in Canada at the time.

1.6.6 Survey response rates

The response rate relative to particular baselines are:

- Completed plus partial completions (59) relative to Interviews (77): 76.6%.
- Completed plus partial completions (59) relative to Sampling Frame (110): 53.6%
- Completed plus partial completions with two case removed (57)²² relative to Interviews (77): 74%.
- Completed plus partial completions with two case removed (57) relative to Sampling Frame (110): 51.8%.

²² Both of the two removed cases are associated with partial questionnaire completions.

- Completed questionnaires including network data (44) relative to Interviews (77): 57%.
- Completed questionnaires including network data (44) relative to Sampling Frame (110): 40%

1.6.7 Ethics

The ethics protocols for this study were initially approved by the UBC Behavioural Ethics Board on December 10th, 2012 (UBC BREB Number H12-02465). An amendment that added Adam Howe as part of the research team for ethics purposes was approved on June 21st, 2018. As part of the approved ethics procedures, informed consent was provided by the respondents. Consent was first provided verbally before respondents participated in the interview, and secondly, respondents were informed that by completing and submitting the questionnaire they provided consent to participate in the study.

Through the interview and questionnaire protocols, the researchers informed the respondents that the identities of individuals would be confidential, and their responses would be anonymous. These procedures distinguish the Canada study from some of the other COMPON country cases where the identities of organizations were not anonymous. It was decided to promise confidentiality of identities, and anonymity of responses to participants, partly because this is a fairly common practice for social science research in Canada,²³ but also because some of the topics covered in the research were controversial, and the politics over climate change in Canada

²³ See the Tri-Council policy statement on the ethical conduct for research involving humans, here: https://ethics.gc.ca/eng/policy-politique_tcps2-eptc2_2018.html.

were heated at the time of the study. Respondents were informed that various measures would also be taken to ensure the security of the data.

1.6.8 Adam Howe's contribution

I became a member of the research team after the data had been collected. Thus, my contributions have been made in the context of subsequent tasks; in particular, reviewing the literature, developing theoretical ideas, designing and carrying out analyses, data cleaning, data coding, and taking the lead in writing up the findings presented in this dissertation. In a sense, from my perspective, this dissertation is an exercise in secondary data analysis. One key contribution involves the work done in Chapter Three, synthesizing an analysis of media and policy network survey data sets. This analysis of the relationships of visibility and perceived influence between the media and policy spheres in Canada is an area where I have made a substantial contribution that extends the work of Tindall and Stoddart on the larger COMON project. A longer description of my contributions is provided in the preface.

1.6.9 Survey questions

Though Appendix B contains the complete survey, for reference, I have included the 5 network-related questions from the survey below:

1. How frequently [do you] does your organization communicate with each of the following organizations or individuals?
2. Which policy actors are especially influential in domestic climate change politics?
3. Who are your or your organisation's sources of expert scientific information about climate change?

4. Please mark all the policy actors that have a strong influence on you or your organisation's stance related to climate change.
5. With which other policy actors do you or does your organisation collaborate regularly concerning climate change issues and politics?

All of the organizations that the survey respondents represented were included as targets in the survey. These network targets were identified partly using the sampling strategy outlined below. The list was also supplemented by Dr. Tindall and Dr. Stoddart based on their immersion in studying the Canadian climate change policy network over several years, by the addition of a number of further organizations and individuals they identified as being significant in the Canadian policy network. In total there were 171 targets that represented the range of policy-relevant actors in Canada. For the analyses in this dissertation, chapters Two and Four focus exclusively on the 44 organizations where the organization representative completed the questionnaire. Chapter Three focuses on in-degree centrality (the total number of incoming nominations from other network actors) for the network ties, and includes all of the 171 targets.

As summarized above, in total, 77 respondents completed semi-structured interviews, and 44 of these respondents also completed online surveys. The list of respondents covered the range of organization types in the representative sampling frame.

1.6.10 Sampling

The sample for survey targets was designed to be as representative as possible of organizational actors involved in climate change policy making in Canada. Organizational actors were included

in the sample based on four key criteria, meant to capture particular types of participation and/or influence in climate change policy making in Canada:

1. The actor participated in the Paris Conferences of the Parties (COP) meeting either as an official delegate or a registered observer;
 - a. This captures participation and influence at the international level of climate change policy development
2. The actor provided testimony in either the Standing Committee on the Environment and Sustainable Development (SCESD) or Senate Committee on Energy, the Environment, and Natural Resources (SCEENR) about one of 3 comprehensive climate bills considered during the time period (C-288; C-311; C-377), or was a member of one of these committees;
 - a. This captures participation and influence at the domestic level of climate change policy development
3. The actor participated in Canada's National Roundtable on the Environment and the Economy, either as a committee member or as an expert witness;
 - a. This captures provision of expert/scientific advice/information about climate change related issues
4. The actor appeared in national newspaper coverage related to climate change in the DNA analysis.
 - a. This captures participation and influence within political discourses about climate change policy making

To be included in the final sampling frame, an actor had to appear in any of the four forums a minimum of three times. Triangulating these sources ensured the survey sample was not inadvertently an artefact of either the media discourse network analysis or the other secondary sources.

1.7 Summary

As a result of the myriad social, economic, and political issues that have arisen alongside the changes in the earth's climate, many governments around the world have been prompted to engage in policy making efforts to address some of these issues. In this chapter I summarized how in Canada, the history of climate change policy making has been fraught with advances in, and the scaling-back of, various policies designed to address the negative impacts of climate change. As of December 2021, the federal Liberal government has passed a national carbon pricing scheme (alongside those already in place within some provinces and territories) and has made a range of statements and commitments related to dealing with climate change. These statements and commitments appear to address, in some ways, calls from social movement actors, climate scientists, and some Indigenous communities. However, Canada's national energy strategy remains largely focused on the development and expansion of fossil fuel resources and infrastructure. This is the case despite changes in federal governments with quite different approaches to the issue of climate change. As such, even though the data analyzed in this dissertation were gathered (mostly) pre-2015, they are still a valuable source of information to inform a study of contemporary climate change policy making.

In this chapter I also outlined the overarching theoretical problem addressed in this dissertation, in the context summarized above - how are social network processes related to political discourses and the policy positions of network actors? I summarized the general structure of the Canadian government and described aspects of asymmetrical federalism that are important for understanding the balancing of power among the federal government on the one hand, and the provinces and territories on the other. I then summarized a range of literature utilized in this dissertation, including the literatures on social networks and policy networks, and particular aspects of these literatures related to social structure, social influence and social selection. With respect to policy networks, I summarized the organizational state perspective, the epistemic communities approach, the institutional analysis framework, and the ACF. I also summarized the literature related to discourse networks and DNA. In relation to DNA, I summarized three dominant aspects of the social movements literature – political opportunities, mobilization structures, and the use of media and framing. Finally, I offered a summary of details related to the data used in this dissertation, including details related to sampling, how the data was collected, and response rates, and I discussed some key limitations of the sample.

As outlined earlier in this chapter, in the chapters that follow I build on the ideas presented here and in a series of analyses that each speak to some facet of the overarching question described above. The first of these chapters is a social network analysis of the five network-related survey questions.

Chapter 2: Social structure and social influence in Canadian climate change networks

2.1 Introduction

In this chapter, I analyze five social networks constructed using survey data gathered in the Canadian portion of the COMPON project, which involved surveys completed by Canadian climate change policy actors. Actor types represented in the data include politicians, governments, environmentalists, scientists, think tanks, business leaders, NGOs, and others. The project also included interviews with these actors, and a media analysis that has produced a number of publications elsewhere (Stoddart, Haluza-DeLay, et al., 2016; Stoddart, Smith, et al., 2016; Stoddart & Tindall, 2015; Stoddart, Tindall, et al., 2017)

Drawing on Borgatti et al. (2013) Kitts & Quintane (2020), and Fischer & Sciarini (2015), I categorize the five networks analyzed herein into two distinct types. Three of the networks constitute ‘interactions’ (hereafter referred to as the ‘interaction’ networks). These three interaction networks represent (i) collaboration, (ii) communication, and (iii) sharing of scientific information. The remaining two networks constitute cognitions or ‘perceptual’ relations about how influential other networks are (hereafter referred to as the ‘influence’ networks). The two influence networks analyzed herein represent (i) perceptions of respondents of the influence of other network actors on the respondent’s own organization, and (ii) perceptions of respondents of the influence of other network actors in domestic climate change policy making.

The proceeding chapters in this dissertation use network analytic and regression techniques to investigate particular theoretically significant aspects of two of these networks. However, an important first step of any quantitative study involves a descriptive analysis of the data, and social network analysis is no exception. A preliminary descriptive analysis like this provides an important repository of basic data about the networks analyzed in this dissertation, and these findings will be used throughout discussions in the balance of the dissertation. First, I present and interpret some overall network statistics for whole networks and assess the distribution of degree centralities for all actors within a network. Then, I assess the intercorrelations among the five networks. Finally, I conduct a subgroup analysis of the networks. The insights gained in this chapter about the patterns of network ties and how the networks are related to each other will be important for structuring some of the discussion in chapters three and four, and in my discussions in the concluding chapter.

The utility of whole network statistics lies in their comparison between networks, since they can be difficult to interpret for individual networks alone (Borgatti et al., 2013). For example, degree centralization tells us to what extent a particular network resembles a perfect star, wherein all actors in the network are connected to a single, highly central actor. It summarizes the level of structural inequality within a network, since the amount of power or influence an actor has within a network is largely determined by how central they are (Borgatti et al., 2013; Freeman, 1978; Knoke & Yang, 2008). While it is difficult to interpret this statistic for a single network, we can compare centralization between networks to understand whether one is characterized by higher levels of structural inequality compared to another.

Similarly, the distribution of degree centralities for all actors within a network can tell us about structural inequality in that network. The more the distribution resembles a steeply declining curve, the higher the level of structural inequality within that network, since there are few highly central – or highly powerful/influential – actors and many other actors who are comparatively less central - or less powerful/influential (Borgatti et al., 2013; Knoke & Yang, 2008).

Conversely, if the distribution of degree centralities is smooth and slowly declining, then there is a low level of structural inequality within a network.

Next, I present the results of a QAP correlation analysis done using the network analysis software UCInet.²⁴ This tests how similar the observed patterns of ties are across the five networks. More formally, it offers a measure of the probability of there being a network tie between a pair of actors in one network when one exists between the pair in another of the networks (Hanneman & Riddle, 2005; Hubert & Schultz, 1976). This kind of test allows me to empirically assess whether, and how, network structural patterns associated with types of policy network interactions are correlated with network structural patterns associated with networks of perceived influence.

To build on the QAP results I assess the extent to which these networks are comprised of smaller cohesive subgroups – subsets of network actors “connected through many direct, reciprocated choice relations that enable them to share information, create solidarity, and act collectively” (Knoke & Yang, 2008, p. 72). Because members of these subgroups are more tightly connected

²⁴ See <http://www.analytictech.com/archive/ucinet.htm>.

and structurally similar (in terms of their connections to other actors in the network) with one another compared to the rest of the network (Erickson, 1982; Knoke & Yang, 2008), they tend to be characterized by similar beliefs, attitudes, or ‘ideologies’ (Erickson, 1982). Moreover, a network can contain several of these subgroups that are interconnected. Such a network may be characterized by similar attitudes and beliefs *overall* but have slight differences in attitudes and beliefs *between* subgroups (Erickson, 1982). Another important subgroup structure commonly found in networks is a core-periphery structure. In the core of a network, all actors are maximally connected with one another, whereas in the periphery, actors are only connected to core actors (and not to other periphery actors).

All of these structural aspects of networks can have important consequences for actors in terms of their access to information, advice, and other resources from others in the network, and how influential they are perceived to be (Festinger, 1950; Fischer & Sciarini, 2015, 2016; Freeman, 1978; Henry, 2011; Henry et al., 2011; Malinick et al., 2013; Tindall et al., 2020). The findings of this chapter generally comport with this observation. I find that actors associated with research and environmentalism tend to be more prominent in the three interaction actors compared to other actors, but they are less prominent in the two influence networks. Conversely, I find that many of the actors associated with business and government are more prominent in the two influence networks compared to other actors, but less prominent in the three interaction networks.

The balance of this chapter proceeds as follows. First, I summarize the literature on analyzing social networks. Then, I summarize the data and methods used herein, and present the results of

my descriptive network analysis. Finally, I summarize and discuss the findings. I now turn to a brief summary of recent climate change policy contexts in Canada.

2.2 Literature review

2.2.1 The social network approach

The social network approach is a structural one that is “based on the study of interaction among social actors [and is] grounded in the intuitive notion that the patterning of social ties in which actors are embedded has important consequences for those actors” (Freeman, 2004, p. 2). In network parlance an actor is called a ‘node’ or a ‘vertex,’ and a relationship between two nodes or vertices is called an ‘edge’ or a ‘tie.’ Since Freeman’s description of social network analysis in 2004, this approach has become “well within the mainstream of applied quantitative science across dozens of disciplines and is an important research area in contemporary statistics” (McLevey, 2021, p. 209). The approach emphasizes the “shared *contexts, relationships, and interactions*” (McLevey, 2021, p. 209: emphasis original) of network actors.

The networks analyzed here are policy networks, which are a particular type of social network. A policy network contains actors within a set of social relations who interact with one another in the context of particular policy issues (Adam & Kriesi, 2007; Henry, 2011; Knoke, 2011). The members of the networks analyzed here include representatives of governments, ENGOs and NGOs, think tanks, business organizations, and universities, among others.

As outlined above, the five networks analyzed herein are categorized into two distinct types - the interaction networks (collaboration, communication, and sharing of scientific information) and the influence networks (perceptions of respondents of the influence of other network actors on

the respondent's own organization, and perceptions of respondents of the influence of other network actors in domestic climate change policy making) Kitts & Quintane (2020). In the case of social networks, context is comprised of an actor's connections to other network actors, and their structural position within a network (McLevey, 2021).

In terms of interaction networks, studies have focused on geographic/spatial, as well as relational characteristics and their effects on social networks; specifically, how spatial/structural proximity or social homophily tend to encourage new tie formation (Doreian & Conti, 2012; Friedkin, 2009; Preciado, Snijders, Burk, Stattin, & Kerr, 2011; Schaefer, 2011). With respect to policy networks specifically, analysts have studied how network structure is partly shaped by interactions related to resource dependency (Henry, 2011), and how network actors in key structural positions within policy networks can influence debates or achieve policy outcomes via their interactions with other network actors (Jørgens, Kolleck, & Saerbeck, 2016; P. Wagner & Ylä-Anttila, 2018).

Policy networks can provide a 'social capital structure' allowing network actors to use existing network connections for various ends – for example they may obtain information from key actors, or may seek advice from others to inform and adjust their own network behavior (Festinger, 1950; Henry et al., 2011; Malinick et al., 2013; Tindall et al., 2020). This social capital structure plays a role in fostering trust and reciprocity that underly cooperation and coalition building among network actors (Coleman, 1994; Henry et al., 2011; Putnam et al., 1994).

In terms of how perception is studied in social networks, two common approaches are outlined here. The first approach involves researchers studying the perceptions that network actors have about a particular network. For example, researchers may ask respondents questions about whom they believe is tied to whom in a network, and then assess how accurate these perceptions are to the actual observed network(s) to study different forms of bias people have about the networks they are embedded in (Bondonio, 1998; T. Casciaro, Carley, & Krackhardt, 1999; Freeman, Romney, & Freeman, 1987; Johnson & Orbach, 2002).

Another common approach involves studying how the networks that actors are embedded in affect the perceptions they have, either about other actors in the network (for example, in terms of how influential a respondent perceives other actors to be), or in terms of more general issues (for example, their perceptions of different climate change related policies) (Baron & Tindall, 1993; Bienenstock, Bonacich, & Oliver, 1990; Fischer & Sciarini, 2015; Friedkin, 2001; Friedkin & Johnsen, 2011). Researchers may also study the role of ‘experts’ or ‘opinion leaders’ in influencing attitudinal outcomes of other network actors (Ahn, Huckfeldt, & Ryan, 2010; Huckfeldt, 2001; Huckfeldt, Pietryka, & Reilly, 2014).

Policy network analysts often focus on how the beliefs of network actors inform their choice of new network ties, partly as a result of beliefs they share with other actors (Gronow & Ylä-Anttila, 2016; Jenkins-Smith, Nohrstedt, et al., 2014; Jenkins-Smith, Silva, et al., 2014; Weible & Ingold, 2018). This is related to processes of social comparison (Gartrell, 1987) whereby network actors compare their own beliefs with their perceptions they hold about the beliefs of other actors in the network.

These processes of influence are tied up with the structural aspects of network interactions and occur simultaneously (Fischer & Sciarini, 2015, 2016). For example social network actors may be influenced through various pathways such as sharing of scientific or policy-related information, or through receiving information about the actions and statements of other network actors (Ingold & Fischer, 2014; Ingold & Leifeld, 2016; Laumann & Knoke, 1987; Metz et al., 2018; P. Wagner & Ylä-Anttila, 2018; Ylä-Anttila et al., 2018). Influence may also result from regular collaboration and communication (Ingold & Fischer, 2014; Ingold & Leifeld, 2016; Laumann & Knoke, 1987; Metz et al., 2018; P. Wagner & Ylä-Anttila, 2018; Ylä-Anttila et al., 2018).

Moreover, the structure of one's network is also related to perceptions insofar as smaller, tightly connected, and structurally similar components of networks (often called cliques or subgroups) tend to be characterized by what Erickson (1982) calls ideologies, which means that most/all of the network actors in these subgroups share the same attitude. Larger, more complex networks with interconnected subgroups are characterized by what Erickson calls belief systems, or 'attitude spaces' wherein an overall belief/attitude may be intimated by people, but where differences in attitudes exist between subgroups. In other words, who a network actor perceives as influential depends on who they are connected to, and their structural position within the network.

To understand these kinds of complex network processes related to interactions and perceptions, social network analysts often use various methods of community detection. Two of the most commonly used algorithms are the Louvain and the Leiden algorithms (Kukkonen et al., 2017,

2018; McLevey, 2021; Traag, Waltman, & van Eck, 2019). For reasons outlined in detail below, I employ the Leiden algorithm here. To summarize however, the five networks analyzed herein are not very dense and thus may be characterized by smaller, less-connected communities. The Leiden algorithm is better than the Louvain algorithm at detecting smaller, less-connected communities.

In the sections that follow I analyze the three interaction networks and two influence networks described above, using the social network analytic approach described in this chapter, to provide an empirical base of knowledge that informs the balance of the dissertation. I will focus mostly on the centrality of network actors, their structural positions, and their membership of (or exclusion from) smaller subgroups or communities. In interpreting these results I will draw primarily from the policy network analysis literature - the subset of social network analysis that is specific to policy networks.

2.3 Data

In Chapter One I summarized the broader COMPON project, and the Canada case wherein the data analyzed in this dissertation were gathered. In the two chapters that follow in this dissertation, I focus on the domestic influence network (linked to the media data) and the collaboration network, respectively. In this chapter I will look at all 5 networks (communication, collaboration, source of scientific information, perceived influence on organization, perceived influence in domestic policy). I begin with an overview of whole network statistics for the five networks.

2.3.1 Overview of the networks

This kind of descriptive analysis of networks is part of the usual process of any network analysis, and informs the analytical chapters and discussion that will follow. Generally, interpreting and comparing network statistics can be tricky, because networks vary so widely. Specifically, when interpreting whole network statistics, it is not always clear what the baseline expectations may be. For example, density (the proportion of observed ties divided by all possible ties) empirically tends to be dependent upon on the size of the network, the number and size of sub-groups, and the nature of the relationship captured by a network tie. Whole network statistics are thus best used as a means of comparison with other networks (Borgatti et al., 2013). Table 2.1 summarizes a range of whole network statistics for the five networks analyzed here, accounting for all actors in the networks (N=44). Statistics were generated using the igraph and NetworkX libraries in Python.

Table 2.1 Summary of whole network statistics for five climate change networks.

	Network	Nodes	Edges	Isolates	Density	Centralization	Diameter	Avg. path length
Interaction	Collaboration	44	125	4	.06	.19	8	3.08
	Communication	44	148	4	.08	.17	6	2.48
	Scientific information	44	160	5	.08	.18	5	2.19
Influence	Perceived influence: domestic policy	44	214	3	.11	.18	6	2.37
	Perceived influence: respondent's organization	44	74	11	.04	.29	6	2.52

All of the networks have low levels of cohesiveness or integration (Knoke & Yang, 2008), and are relatively small given the diameter and average path lengths. The influence network related to influence on domestic climate change policy has the highest density (0.11), followed by two of the interaction networks - the network of regular communication, and sources for scientific information (0.08). The collaboration network is the largest in terms of diameter (8) and average path length (~3) and is relatively less dense (0.05) indicating a less connected network of collaboration with few highly connected subgroups of collaboration. Centralization is the “extent a network is dominated by a single node” (Borgatti et al., 2013, pp. 160–161). It is effectively a comparison of the observed networks against a theoretical graph that is a perfect ‘star’ network (Freeman, 1978) making it essentially a measure of inequality (in terms of differences in centrality). The highest score for the five networks (0.20, or 20% of the theoretical maximum) is relatively low, indicating a low variability of degree centrality, or a low level of inequality. Overall the networks are relatively similar to one another with respect to these statistics.

2.3.2 Distributions of degree centrality

The five networks along with log-log plots of the degree for nodes in the networks are shown in Figures 2.1 through 2.5 below.²⁵ To generate the graphs, I used Python to convert the igraph network data into gexf format, which can be read by the Gephi suite of software. I then exported the gexf files from Python and imported them into Gephi for graphing. The log-log plots were

²⁵ Log-log plots use a logarithmic scale on the x and y axes to plot data in order to determine whether the data follow a power law, and in network analyses, can be used as a visual cue for how evenly distributed centrality is throughout a network (Kim & Altmann, 2017). When a log-log plot is concave, this means there are very few highly central actors and many less-central actors. When the plot is convex (similar to those in this chapter), it means there are some highly central actors and some less-central actors, and the distribution of centrality is not even.

generated using the pyplot Python library. Isolates were removed for graphing purposes. In the figures, node size varies based on degree. For the communication and collaboration networks, cumulative degree (in-degree plus out-degree) is used, whereas for the remaining three networks only in-degree is used. This is because the important aspect of the networks related to influence, and the network related to sources for scientific information, is whether actors are perceived as being influential or are used as a source, rather than how many actors a respondent nominated. For the communication and collaboration networks however, number of nominations (out-degree) *is* relevant as a kind of measure of collaboration or communication activity.

Node colour varies based on membership in communities detected using the Leiden algorithm described above (there is no substantive meaning to the choice of colour – they are simply to distinguish group membership). Community membership is also expanded on below in the sections on subgroup analysis. Node size is based on degree centrality.

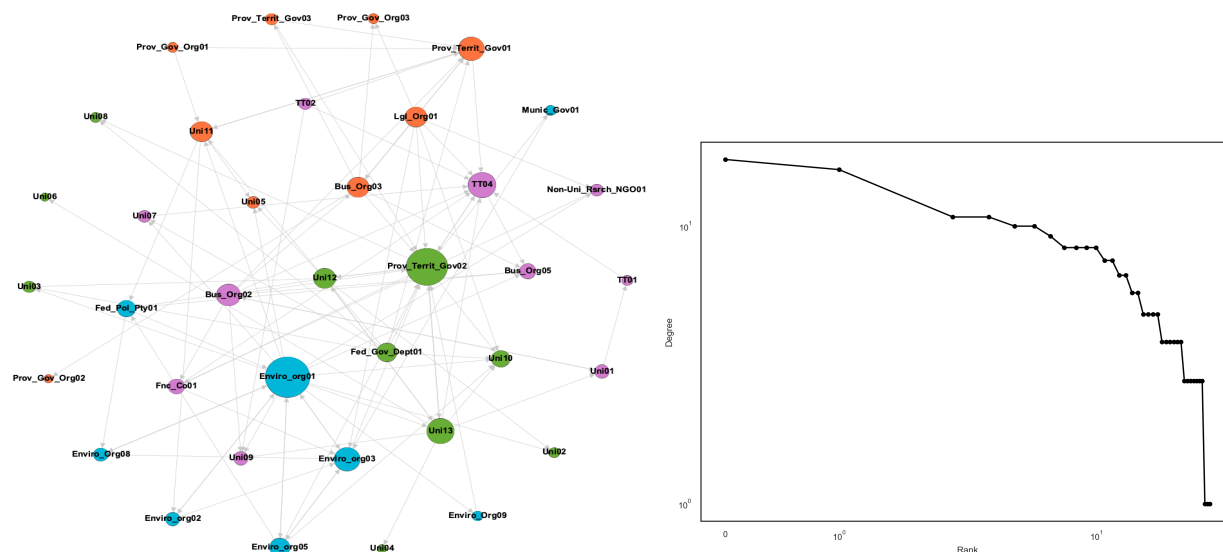


Figure 2.1. Collaboration network with isolates removed, and log-log plot of degree distribution. Colour based on subgroup; size based on degree centrality.

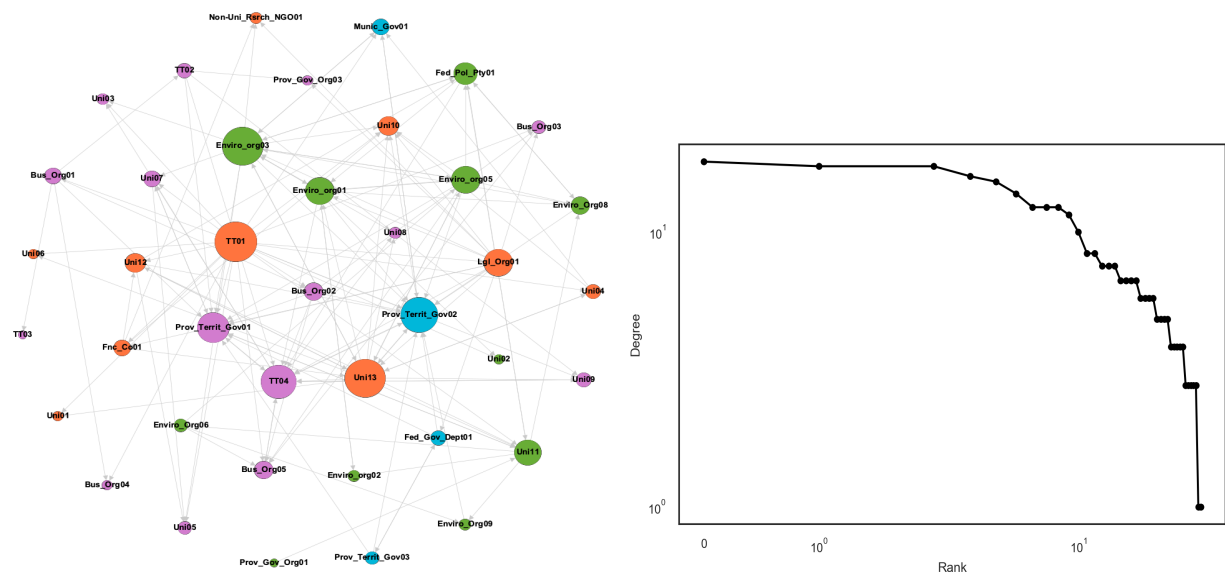


Figure 2.2 Communication network with isolates removed, and log-log plot of degree distribution. Colour based on subgroup; size based on degree centrality.

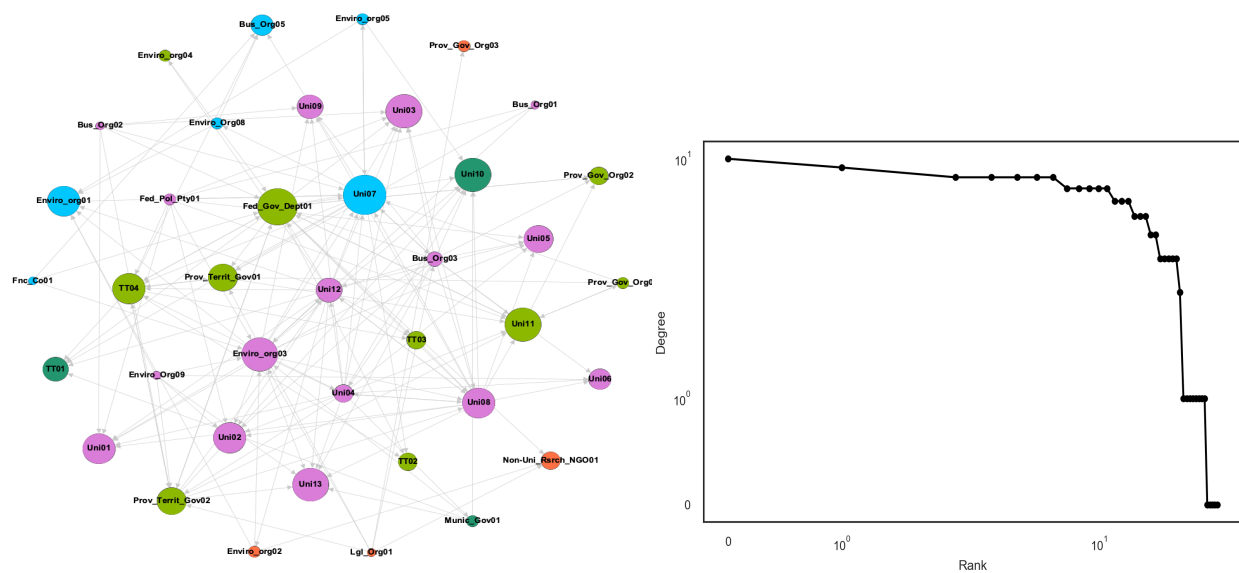


Figure 2.3 Network of source for scientific information with isolates removed, and log-log plot of in-degree distribution. Colour based on subgroup; size based on in-degree centrality.

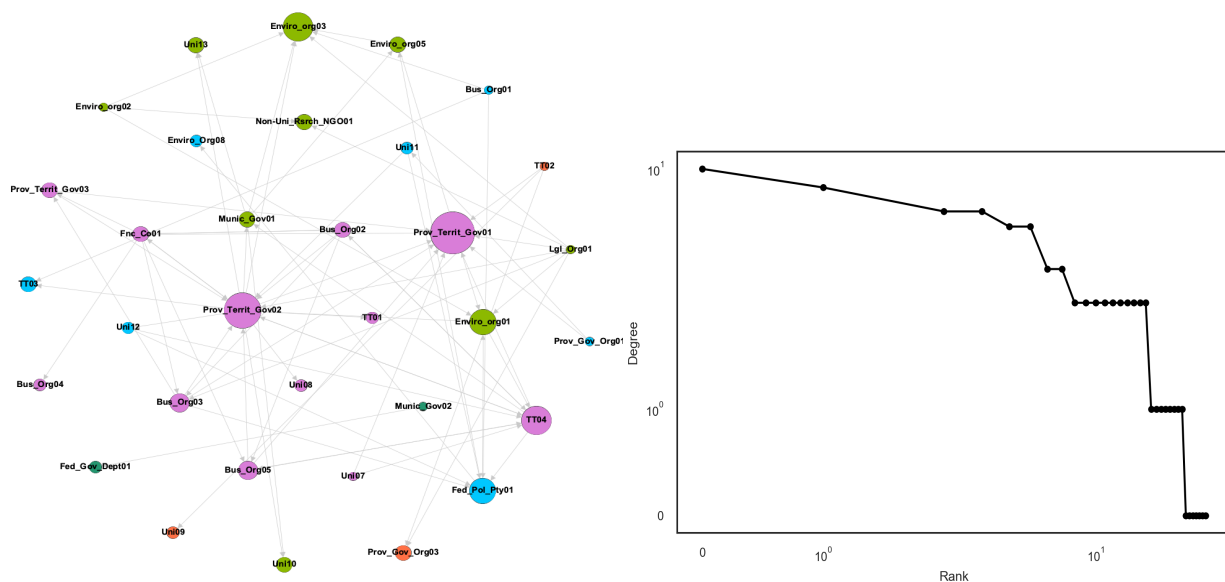


Figure 2.4 Network of perceived influence on organization with isolates removed, and log-log plot of in-degree distribution. Colour based on subgroup; size based on in-degree centrality.

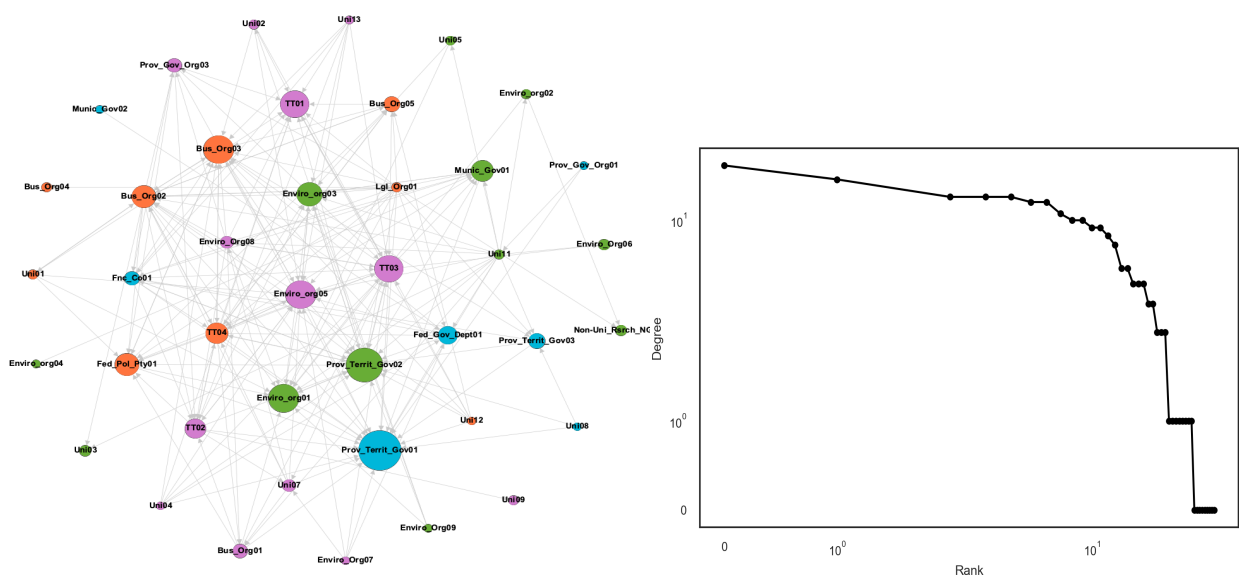


Figure 2.5 Network of perceived influence on domestic policy with isolates removed, and log-log plot of in-degree distribution. Colour based on subgroup; size based on in-degree centrality.

In the collaboration network there are two main highly central actors – first is an environmental NGO (degree = 20) and second is a sub-national government actor (degree = 18). The next-highest degree is 11. There are four communities detected in this network.

There are a number of highly central actors in the communication network, indicating there is a core of actors who communicate regularly about climate change policy in Canada. The six most central of these actors are composed of two think tanks, one university, one sub-national government, and one environmental non-governmental organization (ENGO). There are four communities detected in this network.

In the network of sources for scientific information there are many highly central actors in terms of in-degree. Most of them appear to be members of one community, which is comprised mainly of universities (N=10), but also includes 3 business organizations, two environmental NGOs, and one federal political party. That 10 of the 13 universities in the network should be some of the most central actors in this network makes intuitive sense. There are five communities detected in this network.

In the network of perceived influence on respondents' organizations there are two main highly central actors, both of which are sub-national government actors. If we expand this group to capture the six most central actors (a qualitative choice given the log-log plot), we add a federal political party, two environmental NGOs, and one think tank. Half of these actors are in the same community, the members of which are comprised mainly of government, business, and financial actors and think-tanks. There are five communities detected in this network.

The same two sub-national government actors are the two most central actors in the network of perceived influence on domestic policy. There a number of other notably central actors in this network as well, including mostly government actors and think-tanks, but also some

environmental NGOs and business organizations. There are four communities detected in this network.

To assess the significance of the structural patterns observed here, and to assess the similarity of the five networks overall, QAP correlation to assess the extent to which structural patterns in one network is correlated with the others.

2.3.3 QAP correlation analysis

Table 2.2 summarizes the results of a QAP correlation analysis of the five networks. QAP models are designed to account for the fact that network observations are not independent (Doreian & Conti, 2012). It involves transforming the matrices for each observed network into a single column and using these columns in calculations of statistical correlation (Borgatti et al., 2013, pp. 128–129). To calculate the significance of these observed correlations, the software generates many pairs of similar matrices that are randomly permuted such that they are known to be independent, transforms these permuted matrices single columns and calculates the correlations between these matrices. The software then counts the proportion of these correlations that were at least as large as the observed correlations. This proportion constitutes the p-value (Krackardt, 1987).

The results show that all of the networks are positively correlated with each other, and all of the correlations are statistically significant. Generally speaking, this means that if two actors have a network tie in one network, the likelihood of them sharing a network tie in another of the networks is higher than the likelihood of them not sharing a network tie. These correlations are

only moderately strong. The highest correlations exist between the networks of collaboration and communication ($a = .491$, $p < .001$) and between the collaboration network and the network of perceived influence on the respondent's organization ($a = .418$, $p < .001$).

Table 2.2 QAP intercorrelation coefficients for all five climate change policy networks.

	Collaboration	Communication	Scientific information	Influence: domestic
Communication	.491***			
Scientific information	.277***	.202***		
Influence: domestic	.295***	.238***	.143***	
Influence: organization	.418***	.307***	.233***	.376***

Notes: * $p < .05$, ** $p < .01$, *** $p < .001$.

In general, these results partly support the interpretation of the findings of the examination of degree centralities – there appears to be some statistically significant similarity in the structural patterns of ties among network actors, across the networks. In the sections that follow in this chapter I look closer at the kinds of subgroups in these networks to better understand these results. Looking at how the networks are structured in terms of subgroups can yield insights about how different types actors are connected together, and whether these groups vary in terms of their centrality across the five networks.

2.4 Subgroup analysis

In this section I use two methods of subgroup analysis common in social network analysis – first, a community detection method using algorithms, and second, a core-periphery analysis using k -core decomposition.

2.4.1 Leiden algorithm for detecting connected subgroups

As outlined in the discussion on social network theory in the introduction chapter, social network theory holds that under certain conditions, social structure – in this case, the structure of climate change policy networks in Canada – can affect climate change debates and the positions that policy network actors hold about climate change policies. In other words, who a network actor perceives as influential, who they communicate or collaborate with, or who they use as a source of scientific information partly depends on the structure of the network(s) within which they are embedded. Thus, it is important to have a detailed understanding of the kinds of network structures that make up the five observed networks analyzed in this dissertation, to motivate the analyses and discussions later in this dissertation, and to provide additional insight into the results presented earlier in this chapter. Two common approaches to studying network structure in this way involves the detection of cohesive subgroups, and an analysis of the core and periphery of a network

There are a number of algorithms for detecting subgroups, each with their own advantages and disadvantages. Two of the most common methods are the Louvain algorithm and the Leiden algorithm, which is a slight modification of the Louvain algorithm (Traag et al., 2019). The Louvain algorithm uses modularity - a “quantitative summary of how modular the structure of a

given network is, and which is produced by analyzing the density of edges within a group relative to edges outside the group” (McLevey, 2021, p. 234). Modularity is normalized to range between $-1/2$ and 1, with values approaching 1 indicating a higher degree of modularity (i.e. a network composed of more distinct communities) (McLevey, 2021).

Although a detailed explanation of the algorithm is beyond the scope of this dissertation, McLevey (2021, p. 234) offers a useful generalized summary (in this summary, modularity is denoted ‘Q’):

[...] the algorithm tries to optimize Q by checking how much moving a node into a community will increase Q, and moving it into the community that increases Q the most (if any move is positive). Once Q can’t be improved by moving nodes between communities, the algorithm creates a new representation of the graph where each community is a node. It then repeats the process of trying to improve Q until there is only a single node. When the algorithm creates this new representation of the graph where communities are nodes, this is referred to as the ‘aggregation stage.’

Recently Traag et al. (2019) have pointed out some downfalls with the Louvain algorithm - mainly that nodes can only belong to a single community and that communities cannot overlap. Moreover, there is the possibility that smaller communities often wind up merged into larger ones, and the algorithm can result in poorly connected communities (Traag et al., 2019). This has to do with how Louvain handles maximizing modularity, which involves moving a node into a different community to increase modularity even though this may ‘disconnect’ that community.

If the community is disconnected enough, its constituent nodes may be merged into a larger community. To take an extreme example, a community that is held together by a bridging node may become disconnected if the algorithm moves this bridging node into a different community to maximize modularity (Traag et al., 2019).

To address these issues Traag et al. (2019) proposed the Leiden algorithm, which first considers each community in isolation and maximizes their modularity scores, before creating the new representation of the graph where each community is a node (the aggregation stage). This change means that when using the Leiden algorithm, “[...]a poorly connected community that should be split into multiple smaller communities doesn’t end up swallowed up as a single unhappy unit in the aggregation stage [which] allows Leiden to find smaller, distinct communities” (McLevey, 2021, p. 237). Given these refinements, I use the Leiden algorithm.

Tables 5.1 and 5.2 in Appendix C summarize the community membership of network actors across the three interaction networks, and the two influence networks, respectively. Note that partition numbers have been coded to a descriptor of the community based on a qualitative assessment of the membership of each community in a network. Essentially, the most prominent actor type in each subgroup was used as the descriptor. In cases where there was no clear predominant actor type, ‘other’ was used. This allows for some comparison across the networks. In general, we would expect to see that policy network actors who share common goals with respect to climate change governance, and who share similar stances on the kinds of policies favorable (and not) for these goals should also share membership in a subgroup (Jenkins-Smith,

Nohrstedt, et al., 2014; P. Wagner & Ylä-Anttila, 2018). For example, we would expect that most environmental actors would share subgroup membership in the networks.

All three interaction networks contain subgroups comprised of environmental actors (mainly environmental NGOs), and actors related to government, research, and business. Think-tanks tend to hold membership in subgroups either with government actors or business actors. The network of sources for scientific information doesn't have a coherent business-related subgroup, suggesting that business actors are not used collectively as a source for scientific information on climate change.

Similar patterns for subgroups characterize the two influence networks. Both contain subgroups comprised of environmental actors, as well as actors related to business and government. In the network of perceived influence on domestic policy, think tanks hold membership alongside research actors and business actors, and there is at least one government actor in all subgroups. In the network of perceived influence on respondents' organization, there is no coherent subgroup for research actors, though universities are distributed across the subgroups. Overall this suggests that influence is 'structured' differently depending on how it is being evaluated.

The next thing to notice is who is absent from particular networks – these are isolates, meaning they are not connected to any other actors in the network, and are not reflected in the two tables above. In the three interaction networks it is mainly a subset of environmental NGOs and government actors who are absent, whereas the isolates in the two influence networks are mainly a subset of universities and ENGOs. Table 2.3 summarizes this information.

Table 2.3 Summary of isolates for all five networks.

Network	Isolates
Collaboration	ENGO - 3 Government - 1 Business - 2 Think-tank - 1
Communication	ENGO - 2 Government - 2
Scientific information	ENGO - 2 Government - 2 Business - 1
Influence: domestic	Governmental org. - 1 University - 2
Influence: organization	ENGO - 4 Governmental org. - 1 University - 6

2.4.2 Core-periphery and k -cores

Another way to consider structural grouping in social networks is the core-periphery structure, wherein the core is comprised of the set of nodes in a network that are densely interconnected (connected to each other and others), and the periphery are the nodes that are further away - structurally speaking - from this core group (Borgatti & Everett, 2000; Borgatti et al., 2013)

One of the most common methods for detecting core-periphery structures is the k -cores approach (McLevey, 2021). In this approach k represents a minimum degree, and the k -core will “consist of the largest connected subgraph where all nodes have *at least* a degree of $[k]$ ” (McLevey, 2021 p. 240). Using the NetworkX library in python I ran a series of k -core decompositions on the five

networks, to determine the maximally connected core for each network. For the core-periphery analyses I used $k = 4$ for the network of influence on respondents' organization instead of $k = 5$ because this k -core made much more substantive sense compared to the other. The results are summarized in Table 2.4. Table 5.3 in Appendix C summarizes membership in each core group.

Table 2.4 Results of k -core decomposition for all five networks with cores shaded grey.

Value of K	Collaboration		Communication		Scientific information		Influence: domestic		Influence: organization	
	Nodes	Edges	Nodes	Edges	Nodes	Edges	Nodes	Edges	Nodes	Edges
1	37	104	40	148	39	160	41	214	33	74
2	34	101	38	146	38	159	37	210	26	68
3	27	87	33	136	37	157	32	200	15	47
4	19	63	27	118	30	137	30	194	14	44
5	0	0	20	92	22	105	28	186	5	14
6	0	0	14	63	17	81	27	181	0	0
7	0	0	0	0	0	0	25	169	0	0
8	0	0	0	0	0	0	22	148	0	0
9	0	0	0	0	0	0	18	116	0	0
10	0	0	0	0	0	0	0	0	0	0

I can represent this information visually as well. Figures 2.6 through 2.10 below demonstrate core membership graphically. First, the previous graphs are reproduced but with nodes in the core highlighted and nodes in the periphery masked. Then separate graphs are presented consisting only of the core nodes. Again, color represents subgroup community membership and node size is based on degree.

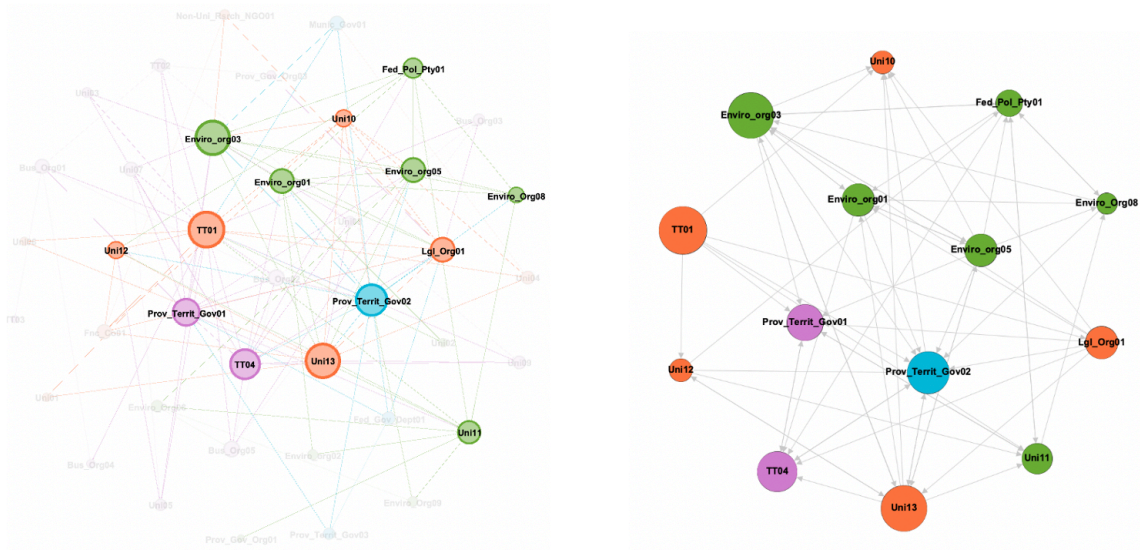


Figure 2.6 Collaboration network with isolates removed and periphery nodes masked, and core network only (k=4). Color based on subgroup; size based on degree centrality.

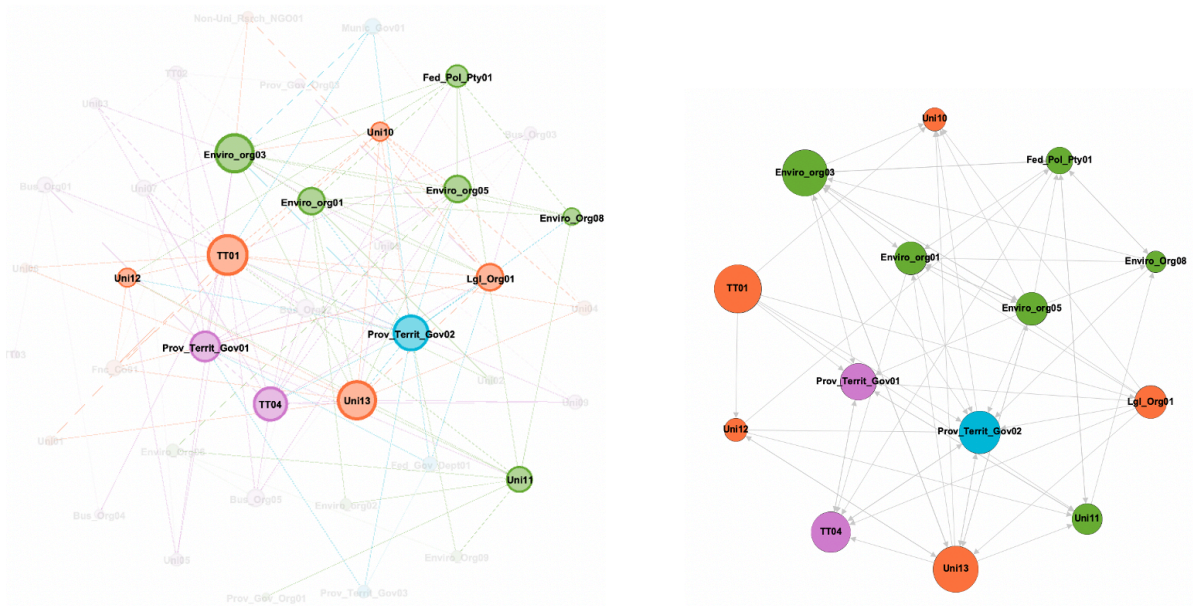


Figure 2.7 Communication network with isolates removed and periphery nodes masked, and core network only (k=6). Color based on subgroup; size based on degree centrality.

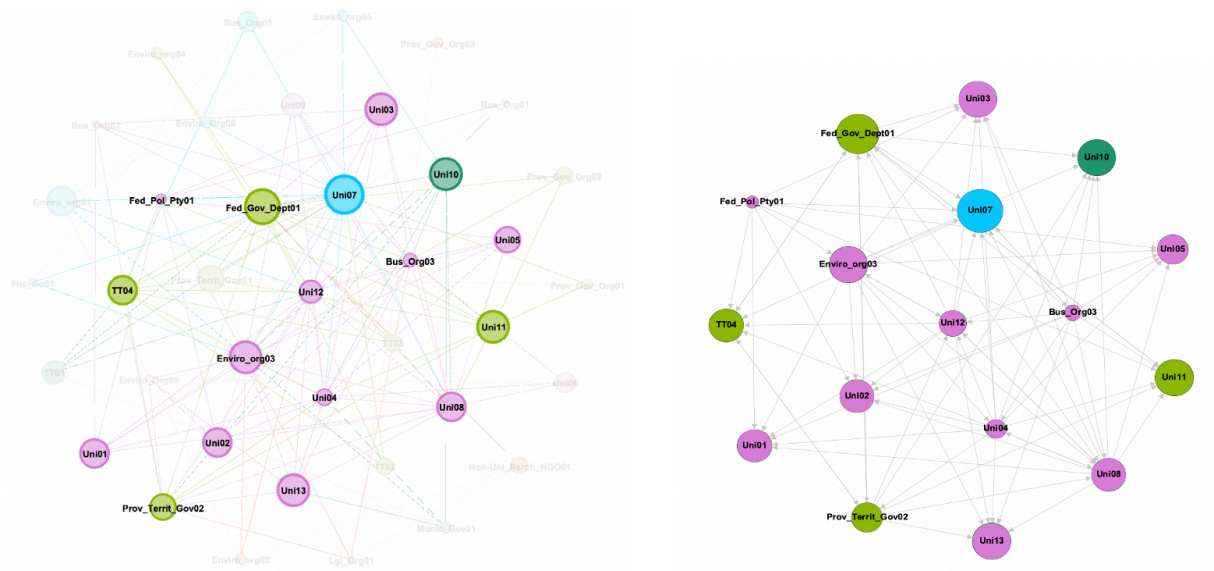


Figure 2.8 Network of sources for scientific information with isolates removed and periphery nodes masked, and core network only (k=6). Color based on subgroup; size based on degree centrality.

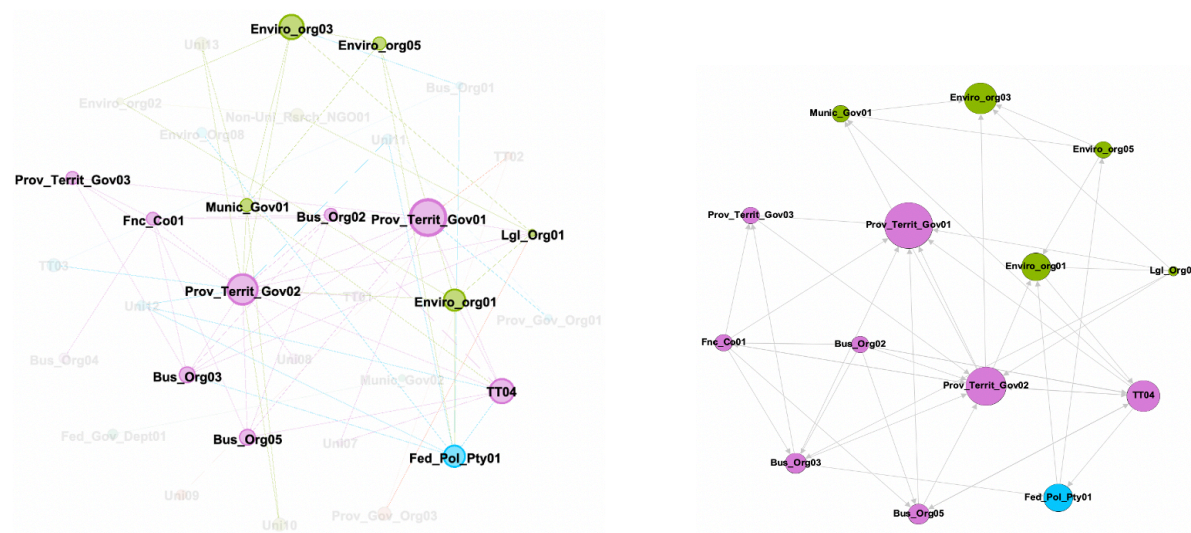


Figure 2.9 Network of perceived influence on organization with isolates removed and periphery nodes masked, and network core only (k=9). Color based on subgroup; size based on in-degree centrality.

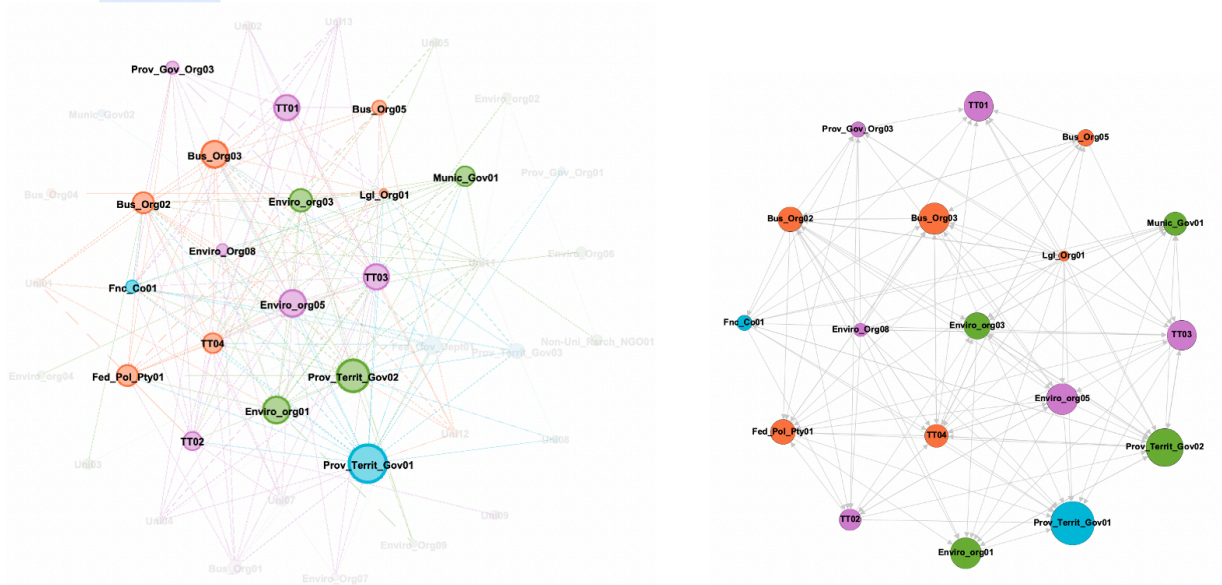


Figure 2.10 Network of perceived influence on domestic policy with isolates removed and periphery nodes masked, and core network only ($k=4$). Color based on subgroup; size based on in-degree centrality.

The stacked bar chart in Figure 2.11 summarizes core membership across the five networks, for all network actors that appear in any of the core networks. In the chart, interaction networks are colored orange and influence networks green. Each network is denoted by a unique pattern/color combination.

In total, 32 of the 44 actors are in at least one of the network cores, and four actors are in all five network cores - one environmental NGO, one think-tank, one federal political party, and one sub-national government. These four actors appear to be quite central to climate change governance in Canada. They communicate and collaborate, are perceived to be influential both in domestic climate change policy and on other actors' organizations, and are key sources of scientific information for each other and for other policy actors.

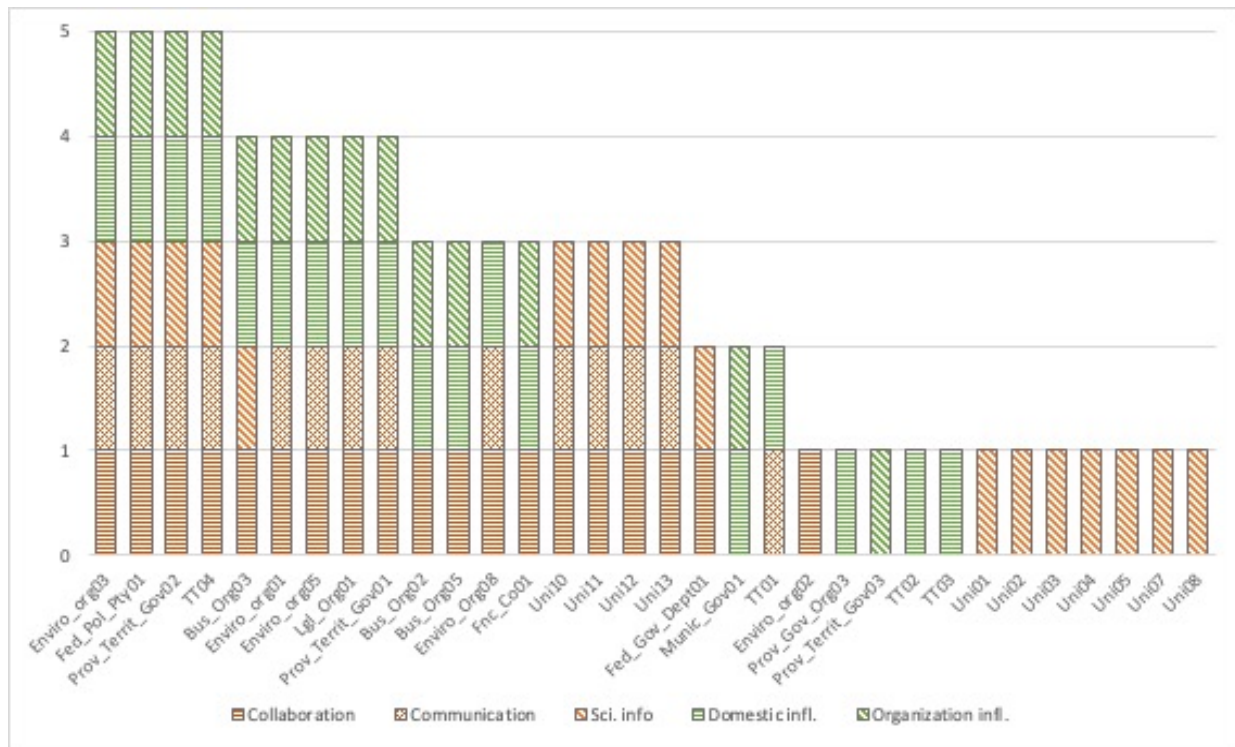


Figure 2.11 Stacked bar chart of core membership for all five networks. Each network denoted by unique fill pattern, and color is based on type of network (interaction = orange, influence = green).

None of the universities are in the core of any of the influence networks, suggesting a limited level of perceived influence for research-related actors in terms of domestic policy and respondents' organizations. On the other hand, four actors are not in the core of any of the interaction networks - two think tanks, one sub-national government, and one governmental organization. While these actors may have some level of influence, their exclusion from the core of interaction networks suggests a limited role for these actors in terms of collaboration, communication, and being sources for scientific information.

We can investigate how network community memberships are represented in the network cores as well. Table 2.5 summarizes the membership of each core network for all five networks. The table then separates the network into the interaction and influence networks. Note that these are

the same substantive communities described in Appendix C, and they are ranked similarly to Figure 2.11 (i.e. the top rows in the table represent the four actors who appear in all 5 network cores, etc.).

Table 2.5 Distribution of substantive communities represented in core networks in all five networks, and between interaction and influence networks.

Substantive communities	Number of actors, all networks	Number of actors, influence networks	Number of actors, interaction networks
Business	20	14	6
Government	19	10	9
Think Tank	16	6	10
Environmental	22	9	13
Research	27	6	21

When we consider these group-related trends in light of Figure 2.11, the four actors who appear across all five network cores represent substantive communities related to environmental, business, government, and research across all the networks. With respect to actors who only appear in a single network core in Figure 2.11, the research-related substantive communities dominate.

Overall (including all network core actors, and all five networks), substantive communities related to research are actually most represented, followed by communities related to environmental, business, government, and think-tanks. However, if we consider just the influence networks, there is a clear skew in the distribution of instances of representation of subgroups, such that business and government subgroups are most represented followed by

environmental, research, and think-tanks. Considering just the interaction networks shows an inverse distribution of instances of representation of subgroups. Here, subgroups related to research are by far most represented, followed by environmental, and think-tanks. Subgroups related to business and government are the least represented in the network cores of the interaction networks. This finding is discussed further below.

2.5 Discussion

These results share some similarities to recent research into climate change governance in Canada showing how contentious the policy making process is (Carter, 2020; Davidson & Gismondi, 2011; Graham, 2019; Stoddart, Mattoni, et al., 2020; Stoddart, Smith, et al., 2016). As outlined earlier, in Canada, strategies related to national energy and economic development in recent decades have revolved around expanding fossil fuel production and export, regardless of the ideological bent of the ruling federal political party (Murphy, 2021). While I do not have direct data on oil and gas actors and federal Conservative politicians, the structural patterns observed in this analysis with respect to business actors (who, it is reasonable to suggest, likely have similar patterns of ties as those of oil and gas actors) and political actors (who, it is reasonable to suggest given the history of climate change governance in the introduction, likely have similar patterns of ties as federal Conservative politicians) is similar in that these actors tend to be connected with each other across the networks.

The distinction made herein between influence and interaction network types, and the findings presented above, help us better understand this general observation. My results show that while subgroups comprised mainly of research and environmental actors are clearly central within

interaction networks, they are less so in influence networks. Conversely, groups comprised mainly of business and government actors are less central in interaction networks but are highly central in influence networks. Put plainly, while many researchers and environmentalists are *doing* a lot of collaborating, communicating, and sharing of scientific information, they don't seem to be successful in translating this action into perceived policy influence. On the other hand, many business and government leaders enjoy significant amounts of policy influence without engaging in much interaction.

One direction of inquiry suggested by the results described above lies in the strategic actions undertaken by influential actors themselves – in this case, those central in influence networks (government and business actors). One key way to gain policy influence involves garnering media attention through public actions – this is one of the central strategies employed by social movement activists (Benford & Snow, 2000; Leifeld, 2017; Russell et al., 2016; Stoddart, Ylä-Anttila, & Tindall, 2017; van Aelst, 2014; Vliegenthart, Walgrave, Baumgartner, et al., 2016b; Vliegenthart, Walgrave, Wouters, et al., 2016). However, key policy actors often have varying need for, and ability to garner, media attention (Stoddart, Tindall, et al., 2017). For example, influential business actors – in this case, those who are central in influence networks – may engage in “strategic invisibility” (Lester & Hutchins, 2012) whereby they withdraw from public communication and other forms of public interaction regarding environmental issues, in order to avoid negative media coverage and a potential loss of policy influence as a result. This notion is investigated further in Chapter Two, wherein I find that the effect of media coverage on levels of perceived policy influence is positive for environmental NGOs, but negative for environmental activists, even though they may be affiliated with an environmental organization.

Another direction of inquiry involves how the interplay of policy related beliefs of network actors, and the micro-structural effects of network connections that actors are embedded within, shape the very networks that policy actors are embedded within. This is important because the structure of policy networks impact how network actors can exert influence on other actors through, for example, regular interaction including collaboration and communication (Ingold & Fischer, 2014; Ingold & Leifeld, 2016; Laumann & Knoke, 1987; Metz et al., 2018; P. Wagner & Ylä-Anttila, 2018; Ylä-Anttila et al., 2018). This raises questions about the relative importance of the policy related beliefs of particular network actors versus the micro-structural effects of the connections they are embedded within for explaining the networks observed. This direction of inquiry is pursued in Chapter Three, wherein I find that in terms of collaboration in Canadian climate change policy, certain policy related beliefs are involved in the formation of collaboration ties, alongside some key microstructural network processes.

2.6 Conclusion

In this chapter I conducted a social network analysis of five Canadian climate change policy networks, focusing on subgroup membership and core-periphery structures. My results show that while subgroups comprised mainly of research and environmental actors are clearly central within interaction networks, they are less central in influence networks. Conversely, groups comprised mainly of business and government actors are less central in interaction networks but are highly central in influence networks. This study expands our understanding of why the strategies undertaken by recent Canadian federal governments are seemingly contradictory and why so much research and activism have not yet led to significant reductions in GHG emissions,

or the amelioration of negative outcomes related to climate change. As with all analyses, those carried out in this chapter do have some limitations, which I discuss in the concluding chapter.

The results suggest some areas for future research by highlighting how research and environmental actors are not perceived to be influential within Canadian climate change policy networks, even though they are more central in interaction networks. It is especially interesting that research related actors do not show up in the core amongst the influence networks, given the role that research has in the policy making process in Canada (Richards, 2018). The analyses presented in the next two chapters provide further insight into these network dynamics, and as of the writing of this dissertation, there is some work underway on a separate analysis focussing on how structural position and influence are related. The preliminary findings from this work coincide with those presented in this chapter; research related actors are perceived by other network actors as being the *least* influential actors in Canadian climate change policy networks. I will return to this point in the discussion in my concluding chapter.

The next two chapters pursue in greater depth two of the directions of inquiry briefly outlined above. This chapter suggests that environmentalists are not perceived to be influential in climate change policy networks. In Chapter Three I make use of data on climate change related media coverage of policy network actors in Canada to analyze how media coverage of environmentalists impacts the extent to which these actors are perceived by other policy actors to be influential in domestic climate change policymaking.

This chapter also suggests that, while all of the five networks analyzed herein are correlated with one another in terms of network structure (i.e. in terms of the patterns of network ties amongst actors), the correlations are not strong, and there are variations in these patterns for different groups of actors between the interaction and influence networks. Another factor that could shape these structural patterns – and particular with respect to structural patterns in collaboration networks – is the particular policy related beliefs that network actors bring to the network (Ingold et al., 2017; Kukkonen et al., 2017; Weible & Jenkins-Smith, 2016). In Chapter Four I analyze a Canadian climate change collaboration network to better understand how endogenous (related to network structure) and exogenous (related to actor attributes or beliefs) factors drive the formation of this network.

Chapter 3: Media coverage and perceived policy influence of environmental actors: good strategy or pyrrhic victory?

3.1 Introduction

Research on the relationship of media coverage to policy influence historically tends to assume a symmetry between mediated political communication and policy influence/power (Russell et al., 2016; van Aelst, 2014). Previous analyses of the media-policy link specific to climate policy tend to focus either on influence within policy networks or visibility within media networks in isolation and draw inferences about how the two spheres are related based on a set of theoretical assumptions (Stoddart, Ylä-Anttila, et al., 2017). In this chapter I move beyond theoretical assumptions by empirically examining the association between climate change related media coverage of environmental activists and ENGOs, and the influence these actors are perceived as having in a climate change policy network.

With respect to policy influence, news media are linked to public policy in two important ways. First, news media provide the backdrop for contests between various conflicting interpretive frameworks or ‘framings’ of issues such as climate change, mobilized by interested constituencies (Benford & Snow, 2000; Leifeld, 2017). Second, public policy is partly made through the influence that interested constituencies exert on policy makers through news media coverage (van Aelst, 2014; Vliegenthart, Walgrave, Baumgartner, et al., 2016b; Vliegenthart, Walgrave, Wouters, et al., 2016). These enactments are shaped by a constellation of factors including journalistic norms and practices, the strategies and mobilization campaigns used by activists, industry and trade, and the particular types of overarching formal political

processes/opportunity structures at play (Hutchins & Lester, 2015; Leifeld, 2017; Meyer & Minkoff, 2004).

Literature on the media-policy link from the fields of agenda setting (van Aelst, 2014; Vliegenthart, Walgrave, Baumgartner, et al., 2016b; Vliegenthart, Walgrave, Wouters, et al., 2016; Walgrave & Vliegenthart, 2012), policy networks (Kukkonen et al., 2018), and social movements (Gamson, 2007; Malinick et al., 2013; Meyer & Minkoff, 2004) suggests actors who garner more media coverage should be perceived as more influential in the policy sphere compared to those who garner less. Moreover, environmental actors have “stronger incentives to get media coverage than industry actors in order to reach bystander publics and put pressure on governments” (Stoddart, Tindall, et al., 2017, p. 386).

However, research on the Canadian media and policy spheres suggests that even if environmental actors are more prevalent in media coverage, this media presence may not always be positively associated with policy influence and outcomes. For example, recently in Canada environmental actors are more prevalent than industry actors in climate change related media coverage. At the same time, the interests of environmentalists are rarely reflected in climate policy, while those of industry often are (Carroll, 2018; Stoddart, Tindall, et al., 2017).

Building on this observation I analyze how media coverage of environmental actors is associated with their perceived policy influence. I find that for individual activists, more media coverage is associated with less perceived policy influence, while for environmental organizations there is no

significant association between media coverage and perceived policy influence. I use some of the qualitative interview data to expand on my findings in the discussion of this chapter.

This case raises fundamental theoretical questions about how sociopolitical reality is enacted, shaped and received through media, about the nature of relations between media and policy spheres, and about whether—for activists—media success is a pyrrhic victory (a victory that ironically leaves the victor damaged to such an extent that it is tantamount to a defeat) in terms of policy influence.

3.2 Literature Review

3.2.1 Influence

Political influence is a complex social phenomenon that can be difficult to measure in a meaningful way in terms of direct impacts on policy outcomes. Moreover, social influence may be conceived of and operationalized in a number of ways. One possibility is to approach influence as an objective, outcome-based measure to study whether an actor objectively has had an influence over other actors. For example, Vliegenthart, Walgrave, Wouters, et al. (2016) examine how media coverage of protest impacts question periods in European parliaments (an outcome measure of influence). They find that although media coverage of issues generally results in questions in Parliament pertaining to these issues (evidence of a positive outcome of influence for activists), this is an indirect effect mediated through the broader issue agenda of mass media, which in turn is moderated by national political institutions.

Another approach common in network analyses conceives of social influence structurally, in terms of network centrality (the sum of all incoming and outgoing network ties an actor has) or structural equivalence (two actors sharing a similar pattern of network ties to other actors; Knoke & Yang, 2008). For example, Heaney (2014) treats perceived influence as an outcome of actors' structural location across multiple intersecting networks of communication, policy issue overlap, and coalition overlap among policy network actors. Heaney finds that playing a brokerage role in communication networks is particularly important to perceived influence, but this cannot be clearly separated from the effects of issue overlap or coalition overlap networks.

By contrast, Fischer and Sciarini (2015) gauge how perceived influence (or 'reputational power') relates to political outcomes and whether policy network actors' understanding of others' reputational power is accurate. They find that policy network actors' assessments of each other's reputational power are generally accurate, though there may be perception bias whereby the perceived influence of closer allies is overstated. Finally, Ingold and Leifeld (2016) examine several German and Swiss policy domains and argue that perceived influence (or 'influence reputation') is a function both of the authority derived from institutionally-defined roles, as well as by actors' structural locations in social networks.

These network studies of influence use ERGMs to simultaneously analyze the multiple interdependent factors that contribute to the perceived influence of policy network actors (Lusher, Koskinen, & Robins, 2013). At the same time, these studies all focus on how perceived influence is shaped by social dynamics that are primarily endogenous to policy networks

themselves, rather than focusing on how perceived influence can be shaped by external factors, such as media coverage.

In this chapter I take neither of these approaches. I conceive of social influence social-psychologically, as a subjective evaluation (Gartrell, 1987) that actors make about other actors (see Heaney & Lorenz, 2013, pp. 260–261, for a good summary of this approach). This approach involves directly asking actors to subjectively evaluate the influence of other actors. Heaney and Lorenz (2013) assert that “although any one respondent is likely to have an incomplete view of the field, [previous research suggests] respondents collectively are expected to provide a reasonably accurate rating of the levels of group influence” (p. 260).

While the network studies outlined above also use a subjective measure of perceived influence, my analysis in this chapter offers an important addition to understanding perceived influence within policy networks. Rather than focussing on disentangling endogenous network processes, I explicitly examine an empirical correlation between media coverage and perceived influence in a policy network. This requires understanding how media and public policy are related.

3.2.2 Media and public policy

Generally, research related to media and policy falls into two streams. The first is political communication, which tends to focus on how media coverage impacts public opinion and the government’s political agenda. The second is political science, which tends to focus on how media functions as an information exchange for policy actors, and how media coverage of particular issues can partly shape the political agenda (see Russell et al., 2016; van Aelst, 2014).

Notably, there is little integration of the two streams (cf. Russell et al., 2016, p. 9), and both bodies of literature tend to use a set of assumptions based on linear/symmetrical relationships between media and policy (Russell et al., 2016; van Aelst, 2014). I depart from this tradition by integrating the policy network and discourse network analytical frameworks.

Policy network analysis seeks to uncover the actors that are influential in policymaking and the interrelations that exist between them (Knoke, 1990; Ylä-Anttila et al., 2018). Policy networks are a specific kind of social network, which can be defined as a set of political actors embedded within a set of structured, yet dynamic interrelations called network ties (Borgatti & Halgin, 2011). Policy network actors socially interact on the basis of particular policy issues (Leifeld, 2017; Tindall, Stoddart, & Callison, 2018; Ylä-Anttila et al., 2018). Actors include “government representatives, but also opposition parties, businesses, social movements, think-tanks, and scientists” (Stoddart, Tindall, et al., 2017, p. 389).

I also integrate a media discourse network perspective into the analysis in this chapter. Discourse networks are constituted by political discourses, which are “verbal interactions between political actors about a given policy” (Leifeld, 2017, p. 302). They involve political actors—including politicians, environmentalists, scientists, think tanks, business leaders, NGOs, and others—making public statements about their policy beliefs, goals, and preferences (Leifeld, 2017). Some such actors are those involved in social movements.

3.2.3 Social movements and media coverage

Studies of media coverage of social movements suggest activists seek media coverage in order to build up reputation, enter into policy debates, impact public policy, and exert influence over policymaking (Kukkonen et al., 2018; Malinick et al., 2013; Wilkes, Corrigan-Brown, & Myers, 2010). Social movements engage in issue framing to try to reshape the frameworks people use to interpret how political issues impact their daily reality (Benford & Snow, 2000; Snow et al., 1986). This potentially influences bystanders to identify with the position of activists, while also encouraging people to mobilize (Snow et al., 1986).

For example, Stoddart, Smith, and Tindall (2016) found activists used the COP15 climate meeting in Copenhagen as a ‘political opportunity’ (Meyer & Minkoff, 2004) to intervene in international media narratives and re-frame Canada’s international reputation as a climate leader. Activists drew international attention to Canada’s poor climate change performance, generating public awareness and political pressure (Stoddart, Smith, et al., 2016). This demonstrates that environmental groups are able to act as “key organizational actors” who play a role in structuring national and international news media discourse, and “articulate substantive claims” (Stoddart, Smith, et al., 2016, p. 260) toward other political actors.

News media remain a key “field of engagement among a range of actors with a stake in climate change policy debate” (Stoddart, Tindall, et al., 2017, p. 386). The link between climate change and media has been extensively studied since about the mid 1990s, both within and across multiple societies, and especially in Europe and North America (Tindall et al., 2018). The type and amount of climate change news coverage differs substantially across countries (Boykoff,

2011; Boykoff, Aoyagi, et al., 2019). Over the last two decades the extent of media coverage of climate change has fluctuated, rising in concert with major media events such as COP meetings and the release of the Intergovernmental Panel on Climate Change (IPCC) and other reports, subsiding in the trough between (Boykoff, 2011; Broadbent et al., 2016). More recently, world media attention to climate change has been steadily rising (Boykoff, Katzung, & Nacu-Schmidt, 2019).

Coverage in Canada is cyclical and event-driven. Between 1997 and 2010, coverage of climate change in Canada's two major national newspapers—the *Globe and Mail* and *National Post*—rose to a peak alongside the release of the fourth IPCC report and the Nobel Peace Prize being awarded to the IPCC and to Al Gore, and declined thereafter (Stoddart, Haluza-DeLay, et al., 2016). As of August 2019, coverage in Canada is up by about 38% compared to August 2018 (Boykoff, Katzung, et al., 2019). Canadian coverage is increasingly oriented toward policy debates and discussion about proposed solutions to climate change rather than debates over climate science or the reality of climate change (Stoddart & Tindall, 2015; Young & Dugas, 2011).

In the analysis in this chapter I am interested in whether, for environmental actors (activists and ENGOs), media coverage like that outlined above is positively associated with perceived policy influence. I examine the empirical correlation between media coverage of these environmental actors and the extent to which other policy actors subjectively perceived environmental actors as being influential in climate change policy making. Based on the literature above, I propose two main hypotheses.

3.3 Hypotheses

The literature outlined above suggests that environmental actors are incentivized to garner media attention, and that those who have more media coverage should be perceived as more influential by policy actors compared to actors who have less media coverage. However, regarding the second assertion, research on the Canadian media and policy spheres suggest the opposite may be true for individual environmental activists. To assess these claims, I test the following hypotheses:

H3.1: Being an environmental actor (either individual activist or environmental organization) is positively associated with media coverage.

H3.2: Being an environmental actor (either individual activist or environmental organization) mediates the media coverage—perceived influence association, such that media coverage is negatively associated with perceived policy influence.

For a variety of reasons, media coverage may not always translate into perceived policy influence. What appears in the media is influenced by processes beyond the importance of particular policy arguments, or the extent to which they appear compelling, such as journalistic norms (Boykoff & Boykoff, 2007; Callison, 2014). Also, debates in media may not accurately capture the “complexities of social interaction that occur within policy networks” (Stoddart, Tindall, et al., 2017, p. 387). Moreover, key policy actors may vary in their “need and ability to get media coverage” (Stoddart, Tindall, et al., 2017, p. 387). For example, influential actors may engage in ‘strategic invisibility’ (Lester & Hutchins, 2012), withdrawing from public

communication about environmental issues to avoid negative media coverage. Therefore, a positive association between media coverage and perceived policy influence should not be treated as axiomatic but rather as an empirical question. I now turn to a discussion of the data and methods.

3.4 Methods

3.4.1 Data

The data were gathered as part of the larger COMPON, which involved a DNA (Leifeld, 2017) of print news coverage of climate change in Canada, and interviews with/surveys completed by Canadian climate change policy actors. The media discourse data used here focuses on articles ($N = 1,140$) from Canada's two main newspapers during the period between June 2006 to June 2010. This period was chosen because it encompasses critical events including the Copenhagen COP meetings, which inspired contention and mobilization, and thus media coverage. These articles were analyzed using Discourse Network Analyzer (Leifeld, 2015), to identify actor agreement or disagreement across a range of concept statements pertaining to climate change governance in Canada. Using this data, I generated a detailed event list used to derive the media coverage variable. Details about the survey and media data were outlined in the introductory chapter. The survey question I focus on in this chapter asked respondents to indicate who they perceived to be influential in domestic climate change policy.

3.4.2 Measures

Descriptive statistics for my main and control variables are outlined in Table 3.1. I conceptualize media coverage as the total number of media mentions an actor received in Canada's two main

national newspapers—the *Globe and Mail* and *National Post*—over the duration of the original study. I conceptualize perceived policy influence as the total number of times an actor was nominated by all other actors in a policy network as being perceived to be influential in domestic climate change policy making in Canada. These represent ‘media coverage’ and ‘policy influence’ respectively in the analyses below.

Table 3.1 Descriptive statistics for non-categorical variables (N = 171).

Variable	Mean	S.D.	Min	Max
Dependent variables				
Perceived influence	6.46	6.24	0	23
Media coverage	7.04	12.16	0	78
Interaction terms				
Activist X media mentions	0.18	1.38	0	17
ENGO X media mentions	0.82	3.69	0	29
Control variables				
% Agree w/business	8.90%	19.81%	0%	100%
% Agree w/government	9.48%	17.16%	0%	100%
% Not in business/government	50.30%	41.10%	0%	100%

The main independent variable in the analyses in this chapter is actor type, summarized in Table 3.2. Similar to Chapter Two, each survey target was assigned one of eight possible actor ‘types’ based on some key dimensions such as the sector they were located in (for e.g., civil society, academia, government, business, etc.), and the type of activity they undertook (for e.g., activism/advocacy, research, governing, business, etc.).

Table 3.2 Descriptive statistics for actor type variable.

Actor type	Frequency	Percent
Government (reference cat.)	45	26.32%
Business	30	17.54%
Research	27	15.79%
ENGO	24	14.04%
Media	21	12.28%
Activist	12	7.02%
Think Tank	6	3.51%
NGO	6	3.51%
Total	171	100.00%

Each actor type is modelled as a binary variable that equals 1 if the target matches that type, and 0 if not. For example, an environmental organization target would have a value of 1 for the ‘ENGO’ type variable, and 0 for all other type variables. I excluded the government type variable, which acts as the referent type. It is important to include government actors in the analyses in this chapter because they are a key part of the media/policy link (Vliegenthart, Walgrave, Baumgartner, et al., 2016b).

Preliminary analyses indicated a potential ‘crossover interaction’ (R. M. Baron & Kenny, 1986, p. 1174) between media coverage and perceived policy influence for individual activists and environmental organizations. Therefore, in the final model in this chapter I interact media coverage with being an ENGO and with being an individual activist. These interaction terms are summarized in Table 3.1 as well. These are included to assess the extent to which being an

individual activist or environmental organization shapes the correlation between media coverage and perceived policy influence. This speaks directly to the main hypotheses related to policy influence.

I include variables to control for the percentage of an actor's media coverage that aligns with the same themes associated with coverage of business and government actors. I also include a variable for the percentage of an actor's coverage that is unrelated to either business or government coverage.

Finally, I include two further dichotomous variables—one controlling for whether actors are federal/national versus sub-national, and one controlling for whether actors are organizations versus individuals. While I do include individual activists as an actor type, there are other actors in the analysis who are individuals (for example, media actors).

3.5 Analytic strategy

In this chapter I use negative binomial Poisson regression, because the main dependent variables are count measures that follow the Poisson distribution and exhibit some over-dispersion (Cameron & Trivedi, 2013, pp. 80–85). Preliminary analyses showed that neither zero-inflated nor zero-truncated regression were a better a fit to the data (for details on model selection see Cameron & Trivedi, 2013; Wilson, 2015). I use Huber–White robust standard errors to account for unequal error variance across observations. This is a common problem with generalized linear regression models, including negative binomial regression. Huber–White robust standard

errors provide asymptotically correct standard errors for models where the variance of residuals is unequal across observations (Cameron & Trivedi, 2013, pp. 84–85).

The first model uses media coverage as the dependent variable to assess the factors associated with media coverage that an actor receives. The second model is the primary model, which regresses media coverage on perceived policy influence. To disentangle the link between media coverage and perceived policy influence for individual activists and environmental organizations, I include the two interaction terms in this model. I now turn to the results.

3.6 Results

The results of the first model related to media coverage are presented in Table 3.3. All else being equal, actors perceived as more influential are associated with more media coverage.

Organizations receive less media coverage compared to individuals, and federal/national actors receive more coverage compared to non-federal/national (regional) actors. Looking at the actor type variables (relevant to H3.1) reveals that compared to government actors, business actors and individual activists receive less media coverage whereas there is no significant difference for environmental organizations, or any other actor type.

Table 3.3 Negative binomial Poisson regression of perceived policy influence on media coverage, with robust standard errors.

Media coverage	Model 1	Model 2
Perceived influence	0.093*** (0.014)	0.093*** (0.014)
Attributes (1/0)		
Organization (0 = individual)	-0.467 (0.241)	-0.569* (0.289)
Federal/national (0 = regional)	0.442* (0.205)	0.623** (0.214)
Actor type (1/0)		
Activist		-1.260* (0.615)
ENGO		-0.267 (0.272)
Business		-0.633* (0.267)
Media		-0.254 (0.325)
Research		0.399 (0.313)
NGO		-0.273 (0.708)
Think Tank		-0.568 (0.330)
Constant	1.259*** (0.252)	1.434*** (0.328)
Pseudo R ²	0.045	0.059
BIC	-584.082	-569.058
N	171	171

Notes: * p < .05, ** p < .01, *** p < .001.

The results of the second analysis related to policy influence are presented in Table 3.4. Higher values of media coverage are significantly associated with higher numbers of nominations as

being perceived as influential in policy networks ($p < .05$). The same holds for being a federal/national actor compared to non-federal/national (regional) actors ($p < .01$).

The higher the percentage of an actor's media coverage that aligns with the same themes associated with coverage of business, the more influential they are perceived to be ($p < 0.10$).

There seems to be no significant association between perceived policy influence, and either (1) the percentage of an actor's coverage that aligns with government, or (2) the percentage of an actor's coverage that is not related to business or government themes. Looking at the actor type variables suggests that, compared to being a government actor, being a business, research, or NGO actor is associated with fewer nominations of being perceived as influential.

Turning to the interaction terms (relevant to H3.2) reveals that for individual activists the association between media coverage and perceived policy influence is significantly negative ($p < .001$), whereas for environmental organizations the association is significantly positive ($p < .001$). For individual activists, more media mentions are associated with fewer perceived policy influence nominations. For environmental organizations, more media mentions are associated with more influence nominations.

Both of my hypotheses are partially supported by these results, and I have some interesting findings with respect to the association between media coverage and perceived policy influence for individual activists. To clarify these results and draw out important implications for theory and future research, I now turn to a discussion of these findings.

Table 3.4 Negative binomial Poisson regression of media coverage on perceived policy influence, with robust standard errors.

Perceived policy influence	Model 1	Model 2	Model 3	Model 4
Media coverage	0.025*** (0.006)	0.020*** (0.006)	0.015** (0.006)	0.011* (0.005)
Attributes (1/0)				
Organization (0 = individual)	0.149 (0.174)	0.121 (0.163)	0.030 (0.207)	0.019 (0.205)
Federal/National (0 = regional)	0.518*** (0.139)	0.624*** (0.145)	0.505** (0.163)	0.545** (0.163)
Coverage type				
% Agree w/business		0.719 [†] (0.390)	1.202* (0.492)	1.268 [†] (0.500)
% Agree w/government		0.776 [†] (0.431)	0.416 (0.441)	0.453 (0.445)
% Not in business/government		0.007 (0.193)	0.212 (0.201)	0.203 (0.201)
Actor type (1/0)				
Activist			-0.101 (0.347)	0.113 (0.360)
ENGO			0.030 (0.212)	-0.298 (0.269)
Business			-0.563* (0.260)	-0.599* (0.261)
Media			0.059 (0.198)	0.050 (0.194)
Research			-0.923* (0.291)	-0.917** (0.293)
NGO			-0.921* (0.495)	-0.925 [†] (0.494)
Think Tank			-0.050 (0.354)	-0.059 (0.358)
Interactions				
Activist X media coverage				-0.130*** (0.033)
ENGO X media coverage				0.044*** (0.012)
Constant	1.316 *** (0.175)	1.174*** (0.200)	1.423*** (0.248)	1.450*** (0.247)
Pseudo R ²	0.028	0.036	0.056	0.063
BIC	-681.579	-672.492	-651.802	-646.420
N. Obs.	171	171	171	171

Notes: [†] p < .10, * p < .05, ** p < .01, *** p < .001

3.7 Discussion

3.7.1 A pyrrhic victory

Recall that the interaction terms in Table 3.4 represent a crossover interaction. In this case, being an individual activist moderates the association between media coverage and perceived policy influence such that the association is negative. In contrast, this association is positive for environmental organizations.

This moderation effect comes into play for actors who had at least eight media mentions. For reference, the average number of media mentions for individual activists in the data is about eight, and about nine for environmental organizations. I can use these regression models along with these averages to predict the total number of nominations of being influential that an individual activist, or an environmental organization, may receive. Using eight media mentions, activists are predicted to get four influence nominations while environmental organizations are predicted to get 10 ($p < .001$).

To better illustrate this interaction, Figure 3.1 graphed adjusted predictions of number of nominations of being perceived as influential for individual activists and environmental organizations. To calculate these predictions, I set the variables for percent of an actor's media coverage related to business, government, and neither, to their mean values. I also assumed that individual activists and environmental organizations are both federal-level actors (this is a more conservative assumption for activists, since many activists are not federal actors). Finally, I set the organization variable accordingly; for environmental organizations the variable equaled 1, whereas it equaled 0 for individual activists.

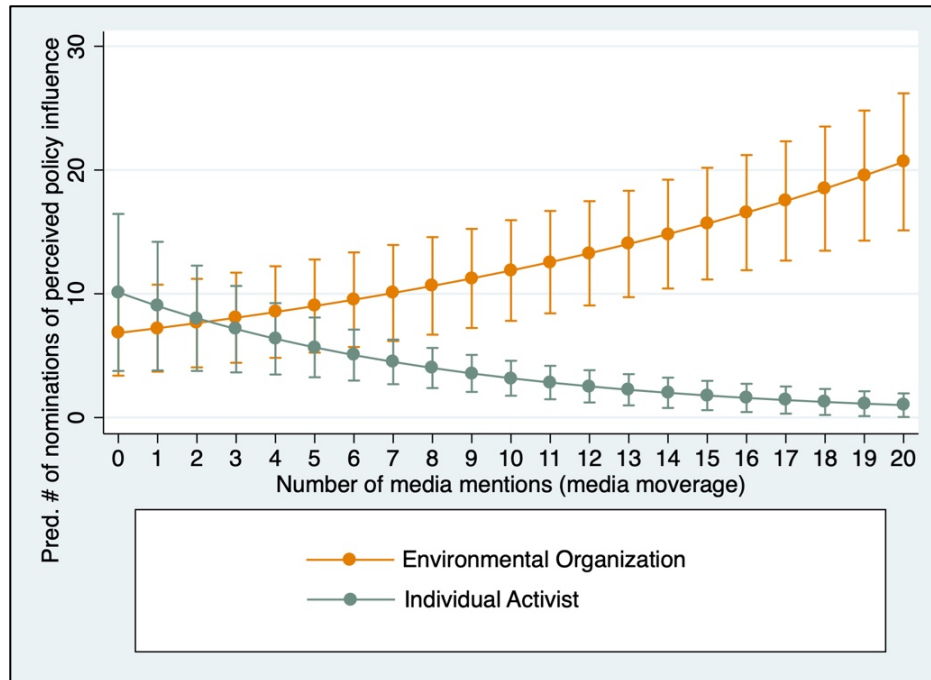


Figure 3.1 Adjusted predictions of perceived policy influence nominations based on number of media mentions, with 95% confidence intervals.

When I consider environmental organizations, neither of my hypotheses is supported. The results suggest that environmental organizations receive about the same amount of coverage as government actors (Table 3.3), and that higher numbers of media mentions are associated with *more* nominations as being perceived as influential (Table 3.4). When I consider individual activists, H3.1 is again not supported—individual activists receive *less* coverage than do environmental organizations (Table 3.3). However, for individual activists, H3.2 is supported—for individual activists, higher numbers of media mentions are associated with *fewer* nominations of perceived policy influence (Table 3.4). Thus, in certain contexts media coverage may actually be a pyrrhic victory for individual activists.

In considering existing theoretical assumptions about the relationship between media visibility and perceived policy influence, the analyses in this chapter suggests that there are other

contextual factors—in this case, the type of actor under consideration—that play an important role in shaping this relationship. These analyses demonstrate that theoretical assumptions of a positive association between media coverage and perceived policy influence need to be carefully examined. This symmetrical relation should not be assumed but evaluated case by case. Future research should seek to elaborate on the conditions wherein a positive or negative relation holds.

Recall from the discussion earlier in this chapter that media coverage may not be associated with perceived policy influence due to a variety of factors—journalistic norms (Boykoff & Boykoff, 2007; Callison, 2014), the complexities of policy networks not captured in mediated debates (Stoddart, Tindall, et al., 2017). and variations in policy actors’ need for, and ability to garner media coverage (Stoddart, Tindall, et al., 2017). In addition, there are many reasons why actors might be selected for media coverage beyond being perceived as influential by other policy actors.

For example, policy networks can provide a kind of social capital, and media actors can be drawn into policy networks through this social capital structure to identify their news sources (Malinick et al., 2013). Journalists do tend to have established relationships with particular sources and rely on them due to considerations of time and accuracy, and the ability of sources to provide reliable, concise, and coherent responses. This is likely a part of the effect of perceived influence on media coverage and is currently being explored by elsewhere by members of the Canada COMPON team.

Nevertheless, I cautiously offer some reasonable potential explanations of the key findings in this chapter related to individual activists. One possibility is that there is some form of institutional legitimacy afforded to environmental organizations as a result of ‘NGOization’, a process whereby grassroots groups and their networks “shift from rather loosely organized, horizontally dispersed, and broadly mobilized social movements to more professionalized, vertically structured NGOs” (Lang, 2013, p. 62). NGOs seek to “influence decision making by gaining some degree of insider status in institutions or in organizations that initiate, prepare, legislate, or execute policy change” (Lang, 2013, p. 22). Moreover, NGOs prioritize “organizational reproduction [and] the cultivation of funding sources” (Lang, 2013, p. 64), which often leads to more recognition from other actors, and a change in status from ‘outsider’ to ‘insider’ in the issue-specific policy sphere (Lang, 2013). As a result, NGOs often seek to contain radical messaging, and reframe it in terms that are more accepted by other policy ‘insiders’. In addition, the strategies and tactics employed by NGOs often shift “toward institutional advocacy and away from public forms of dissent” (Lang, 2013, p. 64)

By operating outside of (and in many ways overtly challenging) this institutional context, individual activists may have a legitimacy ‘penalty’ levied against them. This is consistent with literature on insider and outsider activist strategies (Fogarty, 2011; Grant, 2004), and with literature on organizational characteristics (such as funding) acting as a “common heuristic for judging credibility and broad political ‘allegiances’” (Mclevey, 2014, p. 55; see also Choudry & Kapoor, 2013)

I find evidence of these processes in the interview responses. When asked about the role of environmentalists in climate change politics, one prominent government actor explains how the use of radical messaging, displays of dissent, and challenging institutional legitimacy leads to a lack of perceived policy influence:

I have worked with some [NGOs] that are really very capable, like really smart and strategic, people who kind of look at it and figure out what is the best way for them to engage and make a difference and who they can influence and how to influence them. So, some of the most impressive people I know work in NGOs. But I have also met some people that are just kind of useless, frankly. I mean [...] some people [...] sit there and say “I do not agree with this process, I do not think industry should even be at this table. I do not think any standard that anyone has set was tough enough.” But they did not really shape anything. Everybody in the room, including other NGOs, were like “duly noted” and then we went back to trying to reach an agreement. Right like if you did not want to participate, why are you here?

Another possibility involves the ‘devil shift’ (Sabatier, Hunter, & McLaughlin, 1987) and ‘angel shift’ (Leach & Sabatier, 2005) phenomena. The devil shift is the tendency of political actors to underestimate their own political influence, while simultaneously overestimating the influence and malice of their opponents (Sabatier et al., 1987). In contrast the angel shift is the tendency for political actors to exalt themselves and their political partners (Leach & Sabatier, 2005). These are social-psychological processes mediated through political discourse.

Again, I see evidence of these processes in some of the interview responses. When asked about potential solutions to climate change in Canada, one activist reveals how the failure of political actors to take meaningful action necessitates the use of more drastic action:

If you looked at it when it first started, I would tell you energy efficiency and incremental improvements are the best way to go about it because then you can achieve it without too many disruptions to the economy. That is no longer the case. Now we need to have disruptive action in order to make the most effective changes that we can as quickly as we can. So, in fact [...] what we have to do is becoming harder. And there is still not a recognition in politicians [...] that extreme things have to be done in order to avert the disaster that is awaiting us.

When asked about the current state of climate change politics in Canada, the same activist extolls the virtue of their own position in the face of opposition:

The politics of climate change in Canada are very negative [...] It has been used as a tool by the present federal government to beat up on previous governments and to offend [...] So it has been a very bitter kind of battle [...] We have a strong desire to do the right thing but [...] if we are not prepared to cap our emissions we are not going to be able to achieve anything.

Moreover, the constellation of actors in the field of environmental policy also shapes how media coverage affects policy influence (van Aelst, 2014). Earlier in this chapter I outlined how the Canadian environmental policy field is largely characterized by interlocking relations between

industry and state actors (Carroll, 2018). It is also true that media coverage of sensational issues like the environment has a high likelihood of influencing the public and the policy agenda (van Aelst, 2014).

When this is considered alongside the preliminary explanations and interview data outlined in this chapter, it is reasonable to argue that there may be some push back—at least from industry and/or government actors—against individual environmental activists, whose main targets are industry and state actors and existing political institutions, and who are highly motivated to garner media coverage. In contrast, the more consensus-oriented strategies of environmental organizations could explain their relatively more influential position. Alternatively, individual activists in more radical groups may be more prominent in media coverage, while those in more mainstream groups may be less (cf. Malinick et al., 2013).

While this is by no means an exhaustive exploration of possible explanations for the findings in this chapter with respect to individual activists, these two explanations are plausible, supported by literature, and at least somewhat reflected in the interview data.

3.8 Limitations

I acknowledge that the relationship between media coverage and perceived policy influence is bidirectional. That is, media coverage may be associated with perceived policy influence, and being an influential policy actor may garner more media coverage. To fully explore this question requires analyzing longitudinal data. In an ideal research design, researchers could try to model how this relationship changes over time, how the introduction of new actors into a policy domain

affect this relationship, or how different strategies used by actors shape this relationship. While these are important questions, they are outside the scope of the analyses done in this chapter.

First, my analytical design is not longitudinal but cross-sectional. I assert that although a longitudinal design is ordinarily considered a methodological improvement on a cross-sectional one, it still may not adequately address the question of bidirectionality. For example, consider the bidirectional inter-relations between the issue attention cycle and media coverage (Downs, 1972), or the many associations between media coverage, actor influence, and political opportunity structures. Moreover, cross-sectional methods can be quite robust. Recall that ERGMs – a cross-sectional method specifically designed to analyze network data – have proven successful at disentangling the complex network-based processes that shape influence in political networks (see Fischer & Sciarini, 2015; Heaney, 2014; Ingold & Leifeld, 2016).

Second, I am examining the correlation between media coverage and perceived policy influence in this chapter. In terms of practicality, answering longitudinal questions is easier to do with media data than with network data, given access to actors and the resources required to gather network data. Nevertheless, the analyses in this chapter represent one of the first to empirically examine this correlation, and the first I am aware of using Canadian data, and an important addition to extant literature on social influence in policy networks as well as literature on social movements and media.

A third limitation of the analyses in this chapter relates to the measure of perceived policy influence. I have evidence of an empirical correlation between media coverage and perceived

policy influence and examine that herein. However, it may be argued that no single actor in a policy network has complete information about all other actors in the network, and that evaluations of influence could be shaped by personal relations between network actors (Heaney & Lorenz, 2013).

I argue – in line with Heaney and Lorenz (2013) – that the measure used in this chapter is valid for two main reasons. First, actors in the network are “uniquely knowledgeable of the inner workings” (Heaney & Lorenz, 2013, p. 261) of climate change governance in Canada. This agrees with Fischer and Sciarini’s (2015) findings outlined earlier that network actors’ understanding of the reputational power of others is accurate. Second, as explained in methods section of Chapter One, the sample of policy actors was designed to be representative of the climate change policy domain in Canada and has very good coverage of the key actors involved in climate change governance in Canada. I expand on the potential for studying other aspects of this relationship in the future analyses section of Chapter Five of this dissertation.

Finally, the discourse network data precedes the policy network data by about five years. It is not clear whether or not this improves the validity of the analyses in this chapter (by acting as an informal time lag), so readers should keep this in mind when considering my findings.

3.9 Conclusion

In this chapter I analyzed how media coverage for individual environmental activists and environmental movement organizations is associated with their perceived policy influence in a climate change policy network. I found that media coverage may be a pyrrhic victory for

individual activists, for whom higher levels of media coverage do not appear to correspond with higher levels of perceived policy influence. This raises fundamental theoretical questions about common symmetrical assumptions about the relationship between media coverage and policy influence (see Russell et al., 2016; Stoddart, Tindall, et al., 2017; van Aelst, 2014), and the efficacy of media for signaling and mobilizing policy influence.

These findings demonstrate that these assumptions are only partly correct and should not be assumed. Rather, the link between media and policy should be an empirical question rather than an a priori assumption. The complex processes shaping media attention and policy influence may be similar but are also independent. They play out in different sociopolitical contexts and are shaped by different mechanisms. This highlights the importance of further research that bridges media analysis and policy network analysis in order to help us better understand how visibility, power/influence, and policy influence work across media spheres and policy networks.

The analyses in this chapter also address the “lack of connections between studies of the media and studies of public policy processes” (Russell et al., 2016, p. 2), and calls for research at the level of individual political actors, to help clarify mechanisms that explain “why and when political actors react to media coverage” (van Aelst, 2014, p. 234). The findings suggest that in a context where government is increasingly hostile toward climate science and climate activism (such was the case in Canada during data collection for this project), media coverage of individual activists may lead policy network actors to perceive activists as less influential than environmental organizations.

I put forth two potential explanations for these findings. The first is related to processes of NGOization and the various ways that political actors use heuristics to judge credibility and political allegiance. The second is related to the devil shift and angel shift phenomena. Both explanations are partly supported by the interview data. Ultimately the goal of the analyses in this chapter is to provide empirical, substantive findings to improve the understanding of climate change governance, environmental activism, and the media-policy link. Some of these explanations will be explored in future analyses by the Canada COMON team, and the analyses in this chapter provide a good foundation for these, and other similar studies.

Chapter 4: Drivers of tie formation in the Canadian climate change policy network: belief homophily and social structural processes

4.1 Introduction

Despite increasing global public awareness and concern about global climate change, most countries have made limited progress toward setting effective carbon reduction targets, or implementing policies to reduce GHG emissions and mitigate the negative effects of climate change (IPCC, 2021; Masson-Delmotte et al., 2018). While the science of climate change has become well-established, much work remains to be done to understand the social and political dynamics that shape climate governance. Social network relationships are a key part of such processes and need more attention because these are the processes through which governance relationships evolve and solidify. Through an analysis of these social network relationships, we can increase our understanding of the social dynamics that facilitate or impede climate policy action.

To this end, in this chapter I analyze some of the social processes related to collaboration in climate change policy making in Canada. Collaboration among a range of actors is an important pre-requisite for designing effective GHG reduction and mitigation solutions. As such, I focus on the social mechanisms that underly policy networks, where policy making processes play out (Ylä-Anttila et al., 2018; cf. Henry, 2011). I show how network analysis helps us understand the formation of climate change policy networks, and the role that exogenous attribute-based components and endogenous network-structural components play in this process.

I draw upon the literature of policy network analysis – and primarily the ACF – as well as the literature on social network analysis. Analytically, I use an ERGM approach to assess the extent to which Canada’s social network of collaboration around climate change policy is associated with actors’ shared policy beliefs, versus the extent to which this network is a product of endogenous micro-structural network effects associated with actors’ local network connections.

Although the ACF is a dominant framework for studying policy making, the reality of the policy making process is more complex than the belief-oriented mechanisms that are at the center of the ACF perspective. Specifically, I show that micro-structural network processes related to structural position also play an important role in explaining tie formation in collaboration networks, alongside certain shared policy beliefs. The analysis in this chapter provides a greater understanding of how competing blocs of policy actors arise. I show that social network dynamics are integral to explaining how advocacy coalitions emerge and solidify. I now turn to a discussion of the literature on policy network analysis.

4.2 Literature review

4.2.1 Policy networks

As summarized in the introductory chapter, a policy network is comprised of actors embedded within a set of social relations, who interact on the basis of particular policy issues (Adam & Kriesi, 2007; Henry, 2011; Knoke, 2011). Details about the kinds of actors included in this analysis are presented in the methods section in the introduction chapter. Policy network analysis can explore different types of social relations. In this chapter I focus on collaboration with regard to climate change policy making.

Policy network analysis allows researchers to analyze the structural patterns of social network ties actors are embedded within, as well as the structural processes that mediate network behaviors and how the policy beliefs of network actors are implicated in these processes (Adam & Kriesi, 2007; Henry, 2011; Henry et al., 2011; Ingold & Fischer, 2014; Knoke, 2011; Matti & Sandström, 2011). It can help uncover actors that are influential in policy making, and the interrelations that exist among actors (Ingold & Leifeld, 2016; Knoke, 1990; Leifeld & Schneider, 2012; Ylä-Anttila et al., 2018). Moreover, it can shed light on the institutional, economic, and/or cultural mechanisms that informally shape policy making, and how they combine to produce national environmental policy responses (Broadbent, 2017; Ingold et al., 2017; Jasny, Waggle, & Fisher, 2015; Ylä-Anttila et al., 2018).

A dominant perspective in the policy network literature is the ACF, which was summarized in the literature review in Chapter One. In terms of the ACF framework, of particular importance to this chapter are the assertions related to the beliefs of people involved in the policy making process, and how these ultimately get expressed through policy formation (Jenkins-Smith, Nohrstedt, et al., 2014; Matti, 2013; Matti & Sandström, 2011; Weible & Cairney, 2018; Weible & Jenkins-Smith, 2016; Weible & Sabatier, 2011). The ACF describes a three-tiered structure for beliefs a coalition member may have. At the base are deep core beliefs, which are normative values and axioms that are not specific to any policy domain, but can apply across many policy subsystems (Jenkins-Smith, Nohrstedt, et al., 2014). In the middle are policy core beliefs – more specific and “bound by scope and topic to the policy subsystem” (Jenkins-Smith, Nohrstedt, et al., 2014, p. 191). At the top of the structure are secondary beliefs – those that pertain to “specific instrumental means for achieving the desired outcomes in policy core beliefs” (Jenkins-

Smith, Nohrstedt, et al., 2014, p. 191). In general, policy core beliefs tend to be most central in analyses using the ACF, because they are not easily changed like secondary beliefs, and reflect deeply held values characteristic of deep-core beliefs but are more specific and instrumental (Jenkins-Smith, Nohrstedt, et al., 2014; Kukkonen et al., 2017; Weible & Ingold, 2018).

Consideration of the ACF from a broader policy network analysis perspective sheds light on two important facets of policy processes that are not fully developed in the ACF literature. First, it illuminates the interdependent structural “patterns of interaction” (Henry, 2011, p. 361) among policy actors, from which network relationships emerge (Lubell et al., 2012). Second, it provides a motivation to jointly analyze these network structural processes along with various characteristics specific to network actors – such as their policy beliefs – to better understand how these characteristics are implicated in policy network relationships (Adam & Kriesi, 2007; Knoke, 2011)

I want to emphasize that the ACF and social network centered theories are not necessarily competing approaches. Many ACF studies incorporate facets of social network analysis related to social structure (e.g. see Henry, 2011; Henry et al., 2011; Wagner & Ylä-Anttila, 2018). Nevertheless, the primary driver of network behavior in ACF approaches is a belief-related ‘social selection’ process (Gremmen et al., 2017; Robins & Daraganova, 2013), insofar as the policy beliefs of actors that bring them together into coalitions are exogenous to the policy network, and actors ‘select’ into coalitions based on shared beliefs. This is a limitation of the ACF framework because the broader policy network analysis literature suggests that network ties

can be the substrate for flows of information that are the primary mechanism by which activities in policy domains are orchestrated.

As social network analysts have asserted, selection must be considered alongside processes of ‘social influence’ (Marsden & Friedkin, 1993) whereby network actors come to share some policy related beliefs because of the influence other network actors exert upon them through their network connections (Lusher et al., 2013; Metz et al., 2018). Earlier in this dissertation I summarized how policy networks can provide a social capital structure wherein policy network actors draw upon their existing network connections, and often engage in social comparisons, to obtain information and advice to guide their own network behavior. Network actors may engage in social comparison processes. In addition, this social capital structure supports processes related to “trust and norms of reciprocity” (Henry, 2011, p. 420) that solidify relations of cooperation (Coleman, 1994; Putnam et al., 1994) central to coalition-building and maintenance.

Social network actors may also be influenced through a number of intersecting pathways including sharing of scientific and policy-related information, regular collaboration and communication, and receiving (via media or press releases, for e.g.) information about the actions and statements of other network actors (Ingold & Fischer, 2014; Ingold & Leifeld, 2016; Laumann & Knoke, 1987; Metz et al., 2018; P. Wagner & Ylä-Anttila, 2018; Ylä-Anttila et al., 2018). All of these pathways are partly mediated by network structure.

Thus, network actors can be drawn into advocacy coalitions because of previously existing beliefs (as the ACF suggests), or they can come to share similar policy-related beliefs, and be

drawn into cooperative relations with other actors, as a consequence of what has been termed by others as ‘structural social capital’ (Tindall & Wellman, 2001) based on pre-existing network connections.²⁶

These structural network processes are important to the policy making process for a number of reasons. First, they allow actors to ‘monitor’ what other actors are saying and doing with respect to public policy making (Laumann & Knoke, 1987; Metz et al., 2018; P. Wagner & Ylä-Anttila, 2018; Ylä-Anttila et al., 2018). Second, they allow actors to ‘signal’ resource endowments and/or requirements to other actors (Laumann & Knoke, 1987). Third, network processes can facilitate or shape the ability of actors to ‘cluster’ together to form blocs that are central/influential in the policy making process (Laumann & Knoke, 1987; Metz et al., 2018; P. Wagner & Ylä-Anttila, 2018; Ylä-Anttila et al., 2018). Finally, these processes help build the trust among actors required for effective policy making (Henry, 2011; Laumann & Knoke, 1987; Metz et al., 2018; P. Wagner & Ylä-Anttila, 2018; Ylä-Anttila et al., 2018).

4.2.2 Belief homophily versus structural social capital

As outlined above, I understand social selection in terms of homophily, which is “the principle that a contact between similar people occurs at a higher rate than among dissimilar people” (McPherson et al., 2001, p. 416). The social selection approach of the ACF can be understood as

²⁶ Some social capital scholars have distinguished between structural social capital and cognitive social capital (e.g. Ramón-Hidalgo, Kozak, Harshaw, & Tindall, 2018; Tindall & Wellman, 2001) while recognizing that the two are often linked. For example, network closure (a form of structural social capital) can facilitate trust and shared norms (a form of cognitive social capital); see Coleman (1994). In the present ERGM analysis, tie formation is the dependent variable, and consequently we focus on the role of social structure in tie formation.

a type of homophily linked to values (McPherson et al., 2001), given that in the three-tiered belief structure used in the ACF, beliefs are tied to values. Thus, I conceptualize homophily as ‘belief homophily’.

For example, in the context of collaboration among Swedish policy actors on policies related to managing carnivorous animal species, Matti (2013) demonstrated that belief homophily was the strongest predictor of ‘coordination’ (or collaboration). Ingold and Fischer (2014) studied Swiss climate policy over the course of 15 years, looking at the main drivers of climate policy collaboration throughout the evolution of policy making stages. They found that homophilous beliefs and formal power structures impacted collaboration, and the effects of perceived power structures had little impact. More recently, Wagner and Ylä-Anttila (2018) found that beliefs played a significant role in forming coalitions within Irish climate change policy networks.

In contrast, social network analysts have shown how endogenous mechanisms related to social structure and social influence may be driving tie formation in policy networks – what I term structural social capital, drawing from Tindall and Wellman (2001). For example, Ingold et al. (2017) found that in contexts of dealing with new issues, beliefs played a limited role in coalition formation in a policy network related to emergent hydraulic fracturing (fracking) policy in Switzerland and the UK. They found “[o]nly actors with the same left-green beliefs tend[ed] to agree on policy design” (p. 456) and this was mostly an effect of mutual opposition to specific drilling projects. Endogenous network structures of emerging policy domains can make it difficult for actors to identify ideological peers, thus actors “strongly [relied] on former contacts rather than shared ideologies or leadership” (p. 442). This relates to structural social capital in

that actors came together into ideologically similar clusters as a consequence of being previously “structurally cohesive or equivalent” (Marsden & Friedkin, 1993, p. 133).

Using data from online surveys, Calanni et al. (2015) studied collaborative partnerships in climate governance related to US marine aquaculture partnerships. They found that particular aspects of trust (professional competence and keeping promises) and resource dependency (access to expertise and influence outside the partnership) were more central to coordination than shared beliefs. This relates to structural social capital in that both of these network-based processes (trust and resource dependency) are related to the structural location of network actors, and both influenced tie formation (Friedkin, 2015; Marsden & Friedkin, 1993). More recently Tindall et al. (2020) have demonstrated that actors’ positions in a Canadian climate change policy network are associated with their support for curtailing oil sands development, even when controlling for climate change related beliefs and sectoral affiliation. This highlights the importance of social structure for explaining outcomes.

These studies suggest an important role for structural social capital in climate change policy networks, alongside belief homophily as outlined in the ACF. These two phenomena are often intertwined, though my contention is that they can be analytically separated, and I am interested in how both of these network processes are associated with policy networks. I now turn to a discussion of the research questions and hypothesis assessed in this chapter.

4.3 Research questions and hypotheses

The overarching research questions in this chapter ask, what processes explain the formation of policy networks in Canada, and what does this suggest about policy network formation in general? More specifically I ask: what role do the policy related beliefs that network actors hold play in the formation of a collaboration network? What role do micro-structural network processes related to structural social capital play? In this analysis I focus on collaboration relations, as these are central to engagement in policy making and environmental governance. Based on the review of the literature earlier in this chapter, I offer the following four hypotheses.

The first hypothesis pertains to carbon pricing, which is one of the most widespread proposed solutions for reducing carbon emissions, and especially amongst economists (who tend to dominate policy debates in general) (Nordhaus, 1994; Nordhaus & Boyer, 2000). As summarized in Chapter One, carbon pricing can take a number of forms, some of which are cap & trade schemes and carbon taxes. Both policy measures have been explored in Canada. In this chapter I focus on carbon taxes as this item was asked specifically in the survey. Actors were asked about their level of agreement with the statement: “A federal carbon tax could make a significant contribution to reducing greenhouse gas emissions in Canada.” Drawing upon this item, I hypothesize:

H4.1. The more two actors agree about the desirability of a national carbon tax, the more likely they will be to share a network tie.

The second hypothesis pertains to LNG. The promotion of LNG has been subject to considerable debate in Canadian climate change policy making as well. LNG is shale gas extracted using hydraulic fracking. In recent years LNG has often been touted by some commentators in Canada (and elsewhere) as a ‘transition’ or ‘bridging’ fuel (Stephenson, Doukas, & Shaw, 2012). In particular, LNG proponents have argued that if LNG replaces the burning of coal for energy generation in some key places (such as China), this will result in ‘clean growth’ (Carroll et al., 2020) whereby global GHG emissions are reduced since coal is a greater polluter per unit of energy than LNG. While not all LNG proponents are concerned about the need to reduce GHGs, those who do have such concerns frame LNG as an interim strategy as Canada develops a more energy renewable path.

Support for LNG development tends to come from provincial governments in Canada’s western provinces (mainly Saskatchewan, Alberta, and British Columbia) and from oil and gas companies with LNG operations. By contrast, there are also a number of critics, including prominent climate scientists and environmentalists, who assert that LNG is a highly polluting and carbon-intensive fossil fuel. They argue that framing support for LNG under the guise of climate action is a case of ‘greenwashing’ (Stephenson et al., 2012). Hence many environmental groups and members of Indigenous communities have engaged in political opposition against the development of LNG, and related pipeline projects (Lameman, 2014; Slowey & Stefanick, 2015; Thomas-Muller, 2014). In the survey respondents were asked about their level of agreement with the statement: “Canada should expand its use of natural gas to cut greenhouse gas emissions”.

Drawing upon this item, I hypothesize:

H4.2. The more two actors agree about the desirability of developing LNG in Canada, the more likely they will be to share a network tie.

The third hypothesis pertains to the Alberta oil sands (specifically the Athabasca oil sands), which are the largest deposit of heavy crude oil located in northern Alberta. These deposits are comprised of bitumen which is one of the dirtiest types of oil to extract and process, and this adds significantly to the negative consequences of climate change in Canada and globally (Alvarez-Majmutov & Chen, 2014; Carroll, Graham, Lang, Yunker, & McCartney, 2018; Carter, 2020; Rosa, Davis, Rulli, & D’Odorico, 2017). The oil sands are at the center of sustained political protest from environmental groups and members of Indigenous communities, yet as discussed in Chapter One, they remain central to national energy and economic strategies. In the survey we asked actors about their level of agreement with the statement: “Canada should restrict mining and export of oil sands to cut greenhouse gas emissions.” Based on this item, I hypothesize:

H4.3. The more two actors agree about the desirability of restricting the development of oil sands in Canada, the more likely they will be to share a network tie.

The final hypothesis pertains to structural social capital. I have argued that while the ACF provides a strong rationale for the importance of belief homophily in the policy making process, the framework does not adequately account for the structural aspects of how policy networks arise. Moreover, I have argued that social network processes related to structural social capital are important dimensions of policy networks (Fischer & Sciarini, 2016; Jasny et al., 2015;

McPherson et al., 2001). In micro-structural network terms, two instantiations of structural social capital can be illustrated in processes related to reciprocity (the tendency for one actor to reciprocate a network tie from another actor) and transitive closure – a well-understood process implicated in tie formation, whereby “two individuals may come to form a tie because they both choose the same friends: that is, similarity in choices may lead to tie formation” (Robins, Pattison, & Wang, 2009, p. 106). Based on these insights, I hypothesize that:

H4.4. Reciprocated ties and transitive closure will be significant explanatory micro-structural network processes in the collaboration network.

Now that I have outlined the hypotheses to be evaluated in this chapter, I now outline the methods and analytical strategy,

4.4 Methods

Details about the COMPON project (including sampling details) can be found in the methods section in Chapter One. The network analyzed in this chapter is the collaboration network. This network is visualized in Chapter Two, Figure 2.1. Below in Figure 4.1, I have reproduced only the network portion of the figure from Chapter Two. In the figure, node size varies based on degree and node color varies based on sector membership. There appear to be two highly central actors – one, a sub-national government, the other, an ENGO. Referring back to Table 2.1 shows that this network has a low level of cohesiveness or integration.

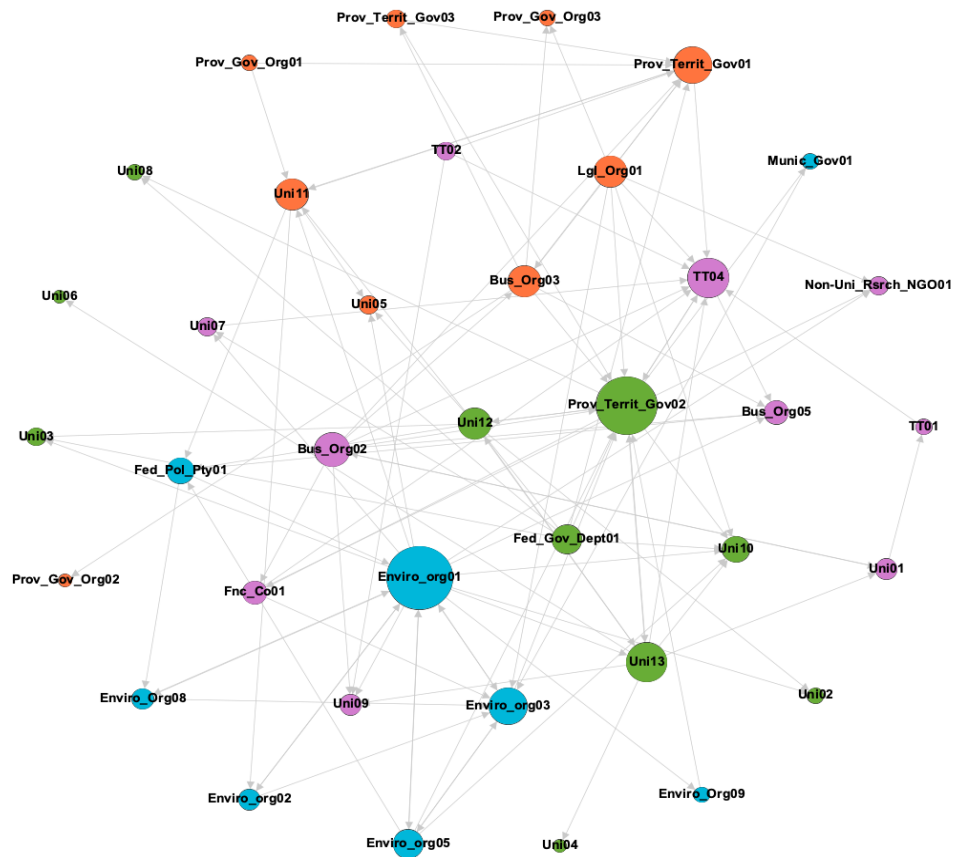


Figure 4.1 Collaboration network with isolates removed.
Colour based on subgroup; size based on degree centrality.

4.4.1 Analytic strategy

In this chapter I use an ERGM approach to analyze the data. As discussed in Chapter One, network observations violate the assumption of independence of cases required for traditional regression techniques (Cranmer & Desmarais, 2011; Lusher et al., 2013). ERGMs overcome this problem by using a class of Markov Chain Monte Carlo algorithms to simulate whole networks by logistically predicting individual network ties one by one (Fischer & Sciarini, 2016; Gronow, Wagner, & Ylä-Anttila, 2020; Leifeld & Schneider, 2012; Lusher et al., 2013). Using an ERGM

I can specify a set of actor attributes and micro-structural network configurations informed by theory, to evaluate the extent to which these are driving the observed network.

To carry out the analysis in this chapter I used the ‘ergm’ package from the ‘statnet’ library in R statistical software (Handcock et al., 2019; Hunter, Handcock, Butts, Goodreau, & Morris, 2008). I analyze the extent to which the likelihood of a collaboration tie is associated with belief homophily, and with structural social capital in a collaboration network of Canadian climate change policy actors. In the first model I control for centrality (in-degree and out-degree) and analyze the role of policy-core beliefs. In the second (full) model I include the micro-structural effects of social capital. I will now outline these measures in detail.

4.4.2 Measures

As outlined above, an ERGM simulates whole networks by logistically predicting individual network ties one by one. Thus, the dependent variable for an ERGM can be considered the observed network; however, it is ‘constructed’ as a series of evaluations of the likelihood of a network tie between two randomly selected network actors, conditional on the model specified.

I model three dyadic terms related to the three belief homophily hypotheses related to carbon pricing, LNG, and developing the oil sands. I model these as the dyad-independent absolute difference in belief scores between two network actors, for each of the survey items that correspond to the belief-related hypothesis. Higher values for these variables mean that two network actors are ‘farther apart’ – i.e. increasingly disagree – with respect to a belief question.

To make interpretation of these terms easier, I can re-phrase this interpretation to better align with the ACF by considering these coefficients in terms of actors increasingly agreeing. In this case, negative coefficients would be interpreted to mean that the more two actors are ‘closer together’ – i.e. increasingly agree – with respect to a belief question, the higher the likelihood of a network tie between them. This is how I will interpret the coefficients for the belief homophily terms, below. Table 4.1 summarizes the mean, standard deviation, minimum and maximum values for these belief questions.

Table 4.1 Descriptive statistics for belief homophily survey items (N=44).
Statistics based on a scale of 1 (strongly disagree) to 5 (strongly agree).

Survey items	Mean	S.D.	Min	Max
Hypothesis 1 A federal carbon tax could make a significant contribution to reducing GHG emissions in Canada.	3.93	.90	1	5
Hypothesis 2 Canada should expand its use of natural gas to cut GHG emissions.	2.84	1.01	1	5
Hypothesis 3 Canada should restrict mining and export of oil sands to cut GHG emissions.	3.34	1.36	1	5

Next, I model the micro-structural network processes related to the structural social capital hypothesis. Specifically, I am interested in reciprocity, local connectivity, and transitive closure. These are some of the most prominent micro-structural processes related to tie formation (Lusher et al., 2013; Morris, Handcock, & Hunter, 2008; Snijders, Pattison, Robins, & Handcock, 2004), and because the presence of these micro-structural processes supports the existence of social opportunity structures where actors can communicate and collaborate “without incurring

significant costs” (Leifeld & Schneider, 2012, p. 732). It is also related to the ACF since actors involved in advocacy coalitions collaborate, and thus share structurally similar network positions.

Modeling these structural processes involves the use of four micro-structural network configurations. The first configuration is a reciprocated network tie, to capture reciprocity. The second is a basic two-path. This acts as a baseline effect for the third and fourth configurations - geometrically weighted dyadwise shared partners (GWDSP), and geometrically weighted edgewise shared partners (GWESP). These correspond respectively to local connectivity and transitive closure.

In terms of the collaboration network, the GWDSP term captures the tendency of two actors, whether they are collaborating or not, to connect locally with actors who share similar patterns of network connections - i.e. to share one or more collaboration partners (Fischer & Sciarini, 2016; Hunter, 2007; Lusher et al., 2013). It is geometrically weighted, which means that the likelihood of two unconnected actors collaborating with an additional actor decreases with each additional collaboration partner (Lusher et al., 2013; Robins et al., 2009)

The GWESP term “measures whether two actors that collaborate are more likely than pure chance to have common partners” (Fischer & Sciarini, 2016, p. 69). In the network, it captures the tendency for two actors who share a mutual collaboration partner, to ‘close’ this triad – i.e. to also collaborate with each other (Lusher et al., 2013; Robins et al., 2009), and is related to the structural social capital notion of network closure (Burt, 2001; Coleman, 1994).

Finally, I control for in-degree and out-degree. Research has shown that some actors may be very central, while others may be on the periphery and less steady in affiliation (Henry, Ingold, Nohrstedt, & Weible, 2014; Jenkins-Smith, Nohrstedt, et al., 2014; Knoke, 1990; Knoke et al., 1996; Weible & Ingold, 2018). Since some actors have degree = 0, these terms also capture isolates in the network. I now turn to the results.

4.5 Results

The results are presented in Table 4.2. The first model includes the edges constant, control variables, and belief homophily terms. The second model is the full model, which includes the structural social capital terms related to reciprocity, local connectivity, and transitive closure.

The edges term is negative in both models, indicating a tendency against tie-formation consistent with the low density of the network. Centrality in terms of in-degree and out-degree are significantly associated with network ties. Moving on to the belief homophily terms shows that all three key policy core beliefs are significant. Two of the belief terms – whether Canada should expand the use of natural gas to curb GHG emissions, and whether Canada should restrict developing the oilsands to reduce GHG emissions – are negative. Since these terms are modelled as the absolute difference between two actors on their belief scores, this indicates that the more two network actors agree with respect to these two beliefs, the higher the likelihood of a collaboration tie between these actors. By contrast, the third belief term – whether a carbon tax would contribute to reducing GHG emissions in Canada – is positive, indicating the more two network actors agree with respect to this belief, the lower the likelihood of a collaboration tie between these actors. This is a surprising finding that I expand on in the discussion below.

Table 4.2 ERGM Analysis of COMPON collaboration network.

Collaboration Network	Model 1	Model 2
Controls		
Edges	-4.80*** (.33)	-4.97*** (.39)
In-Degree	.18*** (.03)	.27*** (.04)
Out-Degree	.20*** (.02)	.29*** (.03)
Policy-Core Beliefs		
Federal carbon price	.34* (.14)	.33* (.15)
Expand natural gas	-.36** (.14)	-.39** (.14)
Restrict oilsands	-.36** (.12)	-.32** (.12)
Micro-Structural		
Reciprocity		.95* (.47)
Two-Path		-.88*** (.23)
Local Connectivity (GWDSP)		.69** (.24)
Transitive Closure (GWESP)		.41* (.20)
AIC	628.30	576.00
BIC	661.60	631.50
N. Obs.	44	44

Notes: * $p < .05$, ** $p < .01$, *** $p < .001$.

Looking at the structural social capital terms reveals that reciprocity has a positive and significant coefficient, indicating that sending a collaboration tie to an actor is associated with an increased likelihood of receiving a collaboration tie from the same actor. The base effect of two-paths is significant and negative. This indicates a tendency against a new tie creating a new two-path in the network. Controlling for the base effect of two-paths, the local connectivity term

(GWDSP) and the transitive closure term (GWESP) are both significantly positive, though the local connectivity term is higher in magnitude and significance than the transitivity term. This suggests that there is more local connectivity in the network (i.e. multiple shared collaboration partners), and to a lesser extent, more transitive closure in the network than would be expected by pure chance.

Substantively, this means that for the GWDSP term, the tendency for a new tie in the network to create a shared collaboration partner between two unconnected actors is more likely than a tie that does not. For the GWESP term, the tendency for a new tie in the network to ‘close’ a collaboration triad is more likely than a tie that does not; in other words, actors who collaborate are more likely than chance to have multiple collaboration partners. For both terms, this likelihood decreases with each additional shared collaboration partner between unconnected actors, or closed collaboration triad.

Figure 4.2 shows the goodness of fit diagnostics for the full model, which demonstrates that the model is a good fitting model. Moreover, the model fit as judged by the AIC and BIC statistics in Table 4.2 confirms that the full model is the best-fitting model. Examination of variance inflation factors for the full model revealed no significant issues with multicollinearity (for more details, see Duxbury, 2018).

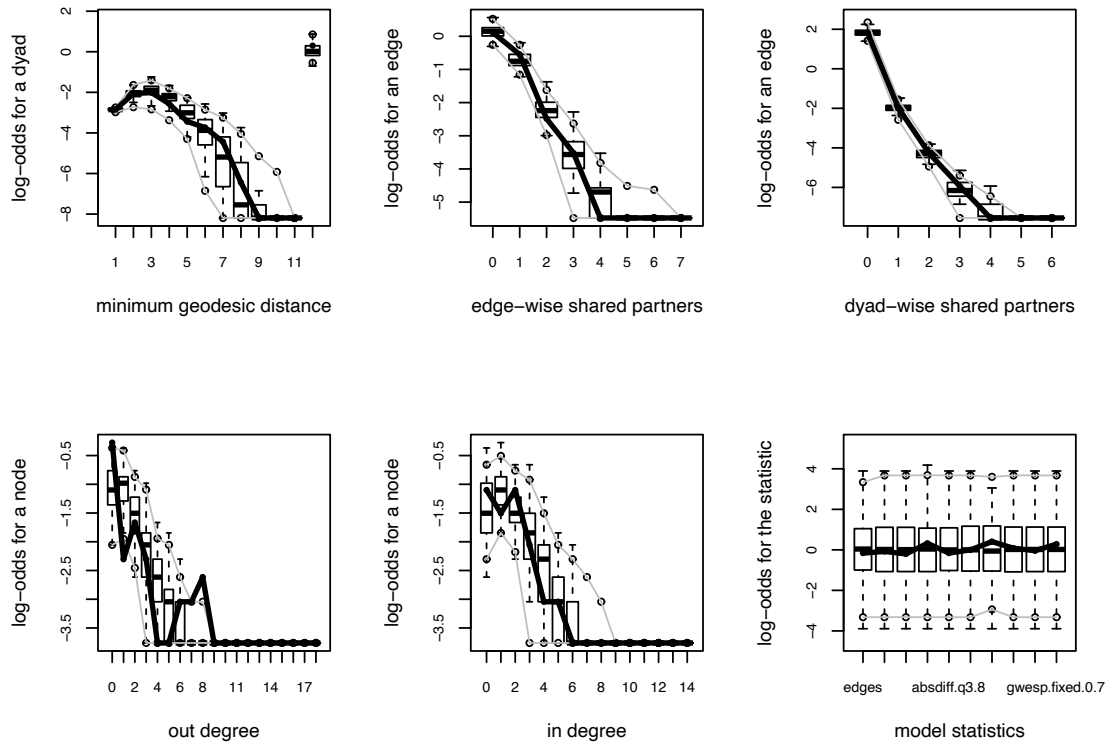


Figure 4.2 Goodness of fit diagnostics for full ERGM model (model 2).

4.6 Discussion

I find some support for both belief homophily and for structural social capital as factors that explain the collaboration relationships in climate change policy networks. Below I will talk about different aspects of the findings in the context of this substantive case, and in the context of the policy network literature.

4.6.1 Policy beliefs – similarities and differences

Regarding belief homophily, agreement between two actors about policy core beliefs related to hypotheses 4.2 and 4.3 (expanding natural gas and restricting oil sands development) are associated with a significantly higher likelihood of a network tie, all else being equal. Put

differently, this means that disagreement over these issues is negatively associated with forming a collaboration tie. In the data, the question about restricting oils sands development had the highest variance. There is significant public and media debate about both topics, so it makes sense that differences in beliefs would be negatively correlated with tie formation.

The interview data supports the finding that policy beliefs about oil and gas development are more contentious and shape collaboration within the policy network. A representative from a prominent ENGO remarked:

We've had many instances where Canada almost moved over the years and then every case it's sort of been pulled back at the last minute. And there's been a lot of evidence that suggest that's from direct and forceful lobbying from the oil and gas industry itself based out of Alberta [...] You know they've had draft oil and gas regulations in a drawer for several years and we've seen [...] that the oil and gas industry's been trying to kill those.

This participant references the strong relationship between the oil and gas sector actors and government. This is consistent with Carroll et al.'s (Carroll et al., 2018) findings related to interlocking ties between these two sectors, as well as other research on the political influence of the oil and gas sector in Canada (Carter, 2020; Davidson & Gismondi, 2011; Stoddart, Mattoni, et al., 2020; Tindall et al., 2020).

In contrast, agreement between two actors related to hypothesis 4.1 (carbon pricing) is associated

with a significantly lower likelihood of a network tie, all else being equal. This may seem counter-intuitive at first glance; however, part of the explanation may be rooted in the fact that there is substantial support for carbon pricing in the policy community (in the data this variable had the lowest variance). Although during the 2000s carbon pricing was contentious and faced significant public opposition (Harrison, 2012), my results suggest that there has since been a ‘mainstreaming’ of carbon pricing as a solution across the climate policy network. By the time the survey was in the field, even those who had a vested interest in supporting the oil and gas sector recognized some non-voluntary measures needed to be taken, including carbon pricing. The interview data provides support for this interpretation. As one respondent from the oil and gas sector highlighted, support for carbon pricing reduced risk and uncertainty in the sector:

[...] the politicians need to set a clear agenda [...] and [...] many of our members ask for a planning assumption of the future and I’ve been on the other side of this where I’ve been in a company trying to put together business cases for different kinds of investments and the fundamental problem you have is not having a cost of carbon going forward you can’t plan for it. You’re guessing what it could be. [...] But it’s like every business decision, you want a clear planning framework [...] [I]t’s up to government to [...] give that to industry [...] so that industry can then plan its way forward. And I think that’s in the best long-term value for Canada and for the industry as a whole, presumably for all the stakeholders [...] I think [our group] would broadly say [...] we understand climate change is a real issue, it needs to be managed and a price on carbon is a fundamental key part of that and we need [...] good long-term planning to enable us to manage that issue and our business and we want to be part of the solution.

Similarly, an oil and gas sector representative had the following to say about carbon pricing:

[Our company] is of the opinion that it is time to move forward with greenhouse gas regulation. We encourage governments to do so. We think it's in the best interests of the sector [...] The best solution to a climate change problem is effective regulation. And that's where the discussion starts. So what is an effective regulation? [Our company supports moving] towards just any climate regulatory policy [...] [W]e see that there's an urgency that's needed and are willing to support any effective climate change regulation even a tax rather than no climate change regulations. So a regulation that is across all emitters and so there's not a competitiveness issue would be ideal.

In sum, it seems this policy belief measure tapped issues for which there was relative consensus among policy actors, whereas the other two policy belief measures (natural gas and oil sands development) identified areas of significant disagreement in the policy community, which seemingly affects whom actors chose to form collaboration ties with. These findings align with the ACF perspective, which asserts that policy beliefs structure collaborative relationships in policy networks. Paradoxically, disagreement about carbon pricing seems to be negatively associated with tie formation. I posit this may be a function of the relative consensus about carbon pricing, and that this may suggest other drivers are at play, such as structural social

capital. It is also possible that, as this effect is less significant than the effects for the other belief variables, that this particular effect merely reflects random error.²⁷

4.6.2 Social capital

Departing from the ACF perspective and its emphasis on policy beliefs, the results highlight that micro-structural network processes related to structural social capital are also key to understanding collaboration within policy networks. Collaboration among network actors partly drives the formation of new network ties and likely reinforces existing ones. The significant and positive GWDSP term suggests there is a high tendency for two actors, whether they are collaborating or not, to share one or more collaboration partners (Fischer & Sciarini, 2016; Hunter, 2007). Moreover, the significant and positive GWESP term suggests a higher tendency for two actors that share a collaboration partner to also collaborate with each other (Fischer & Sciarini, 2016; Leifeld & Schneider, 2012; Lusher et al., 2013; Robins et al., 2009)

Moreover, the presence of a high degree of local connectivity (positive GWDSP) and transitivity (positive GWESP) in the network shows that in part, policy networks function as opportunity structures that reduce the costs of collaboration and facilitate processes of social influence, potentially through pathways including sharing of scientific or policy related information, and other resources (Leifeld & Schneider, 2012; Tindall & Wellman, 2001). This includes the

²⁷ An earlier iteration of this ERGM analysis included control variables related to the sector membership of network actors; however, this model failed to converge. Therefore, it is also possible that this result could partly be due to some interactions between beliefs related to carbon pricing, and organizational/sectoral differences. Readers should keep this in mind when interpreting these results.

possibility that actors' policy beliefs are influenced by the beliefs of others in their network neighborhoods.

4.6.3 Implications for the Policy Network Literature

Overall, these results suggest that while the ACF provides valuable insight into explaining the formation of policy networks, there are also important, network-based structural processes at play that must be considered alongside belief homophily. In fact, my findings related to the direction (positive or negative) of the micro-structural terms in the ERGM model suggest the presence of underlying structural processes inconsistent with an argument that coalition formation is primarily driven by beliefs as argued in the ACF. If advocacy coalitions were conceptualized in terms of network micro-structural processes, they would likely be characterized as highly inter-connected subgroups within a policy network, with relatively fewer inter-group ties compared to intra-group ties. In other words, we would expect a significantly negative GWDSP term indicating a “negative tendency for any two actors to both agree with any third actor” (Ingold et al., 2017, p. 455) and a significantly positive GWESP term indicating a “positive tendency for two actors who agree with a given third actor to also agree among themselves” (Ingold et al., 2017, p. 455).

The analysis in this chapter highlights the complexity of studying underlying policy making processes in general, and the formation of policy networks in particular. This complexity requires bringing a network analytic perspective to bear on analyses of policy making, in addition to the belief-oriented mechanisms that are at the center of the ACF perspective.

4.7 Limitations

This study employed a quantitative cross-sectional research design, focusing on a single case. It therefore shares some of the potential limitations typical of such design (Babbie, 2015), outlined in more detail in limitations section of Chapter Five. This notwithstanding, although ERGMs are cross-sectional, they do not “assume that networks are necessarily static. Rather, the cross-section snapshot represents the accumulation of a dynamic process over time, and theory is used to guide expectations about what types of network structures may have evolved and how they might influence individual behavior” (Lubell et al., 2012, p. 360). Nevertheless, a longitudinal design would provide greater leverage for understanding social network dynamics. But as summarized in Chapter Five, longitudinal studies can be challenging to undertake for a variety of reasons, such as the difficulty accessing study participants, achieving appropriate timing of data collection, and the availability of time and funding. For these reasons, a longitudinal design was not used for the analysis in this chapter.

This is a study of a single case; it is possible that other cases would provide different patterns of variation for key variables. On this note, there is likely less polarization about key climate change issues in Canada than in some other countries such as the United States.²⁸ For example, while not reported here, the data showed much more consensus amongst policy actors about the existence of anthropogenic climate change than Fisher et al.’s (2013) study found amongst U.S. policy makers. It is possible that there are different structural patterns in different country cases, and that different policy beliefs have greater or lesser importance to facilitating tie formation in

²⁸ It is noted, however, that the United States are more of an outlier in this regard, compared to a more ‘typical’ case.

such cases. I expand on this possibility in the section on future direction for research in Chapter Five.

4.8 Summary

The analysis in this chapter expands on extant understandings of how blocs of policy actors arise. In this chapter I built on the ACF perspective, which emphasizes shared beliefs as the main driving force of coalition formation, to show that micro-structural network processes – specifically reciprocity, local connectivity, and transitive closure – also play an important role in explaining tie formation in policy networks alongside certain shared policy beliefs. There remain opportunities to further develop our understanding of the social dynamics of climate change policy making and governance. In the next chapter I draw out the significance of the research done in chapters two through four in terms of addressing the underlying theoretical research question of this dissertation, and expand significantly on paths for future research touched on in this and earlier chapters.

Chapter 5: Discussion and Conclusion

5.1 Introduction

The three chapters in this dissertation offer distinct contributions toward addressing the overarching theoretical question motivating this dissertation: **how are social-structural network processes (such as structural position of network actors, social influence and social selection) related to climate change political discourse and policy positions of network actors?** To facilitate a discussion of how these chapters address this overarching question, I will briefly summarize the main components of the theoretical problem. I will begin with a discussion of social influence and how it relates to social structure, followed by a discussion of the tensions between social influence and social selection, and how policy positions come into play in these processes. Then, I discuss how political discourse and social influence are related, followed by a discussion about discourse network analysis and social influence, in a context of social movements. These sections will remind readers of the core theoretical components related to the overarching question addressed in this dissertation. They also lay the groundwork for subsequent sections where I summarize, synthesize, and discuss the key findings from these chapters. I begin with the discussion on social structure and social influence.

5.2 Social influence and social structure

As discussed in Chapter One, social influence may be conceptualized in a number of ways. For example, social influence is often understood in structural terms, as a network actor's degree centrality (the total number of network ties an actor has to other network actors). This is important partly because, as described earlier in this dissertation, a network actor's ties can function as a social capital structure (Tindall, 2014; Tindall & Wellman, 2001), since policy

network actors often rely on pre-existing network connections in their quests for information and advice (Festinger, 1950; Henry, 2011; Leifeld & Schneider, 2012; Malinick et al., 2013; Tindall et al., 2020). In terms of structural social influence, the more central an actor is, the more potential they have to be influential in a network (Knoke, 1990; Knoke & Yang, 2008; Lubell et al., 2012; Raab, 2002; Wasserman & Faust, 1994). For example, actors who are highly central in a network will likely be more integrated into social capital structures, and may be more able to introduce topics/ideas into policy debates and to impede others from entering debates, thus shaping the debate toward desired outcomes (Fisher et al., 2015, 2013; Kukkonen et al., 2017, 2018).

Social influence may also be considered as a set of more complex process that occurs through an actor's network connections, in a passive or more deliberate manner. This process is not directly measured in the network data analyzed in this dissertation, but it bears keeping in mind when considering the findings. One example of this kind of process may be a network actor sending out information not targeted in any specific way that is then received by other network actors, prompting a change in this actor's attitudes/opinions/policy positions etc. as a result (Friedkin, 2015; Marsden & Friedkin, 1993). This form of social influence generally only requires information, and involves processes of social comparison that network actors make between themselves (or their organizations), and other actors (Gartrell, 1987; Marsden & Friedkin, 1993; Tindall et al., 2020).

Another example may be network actors who come to be persuaded to change their attitudes/opinions/policy positions etc. as a result of deliberate influence exerted upon them by

other network actors (Friedkin, 2015; Ingold & Leifeld, 2016; Lusher & Robins, 2013a; Marsden & Friedkin, 1993; Metz et al., 2018; Shalizi & Thomas, 2011; Tindall, 2014). For example one actor may offer some form of incentive or sanction to another actor, or offer organizational support for an actor in exchange for support on a particular issue or policy of concern to their own organization (Broadbent, 2017; Peters & Zittoun, 2016; Raab, 2002; Tindall, 2014).

A third way of conceptualizing social influence is in terms of social psychology, and is the approach taken throughout this dissertation. In this approach the focus is on the ‘subjective evaluation’ (Gartrell, 1987) that policy network actors make about how influential other policy network actors are. This also involves some measure of social comparison (see Heaney & Lorenz, 2013, pp. 260–261, for a good summary of this approach). For example, some of the network data I analyzed in this dissertation is based on survey responses to questions asking respondents about how influential they perceived other policy network actors to be with respect to domestic policy making, and with respect to the respondents’ organizations. Although not a direct measure of the objective distribution of influence in a network, this approach is generally regarded to be a good representation of the distribution of influence in policy networks (Heaney & Lorenz, 2013). One factor that is commonly understood to complicate the study of social influence is the phenomenon of social selection.

5.3 Social influence, social selection, and policy positions

One of the more important principles demonstrated through social network analysis generally, and policy analysis specifically, is how social structure and social influence are related (Ingold & Leifeld, 2016; Knoke, 1990; Laumann & Knoke, 1987; Marsden & Friedkin, 1993). Recall that

social selection is the tendency for network actors who share similar beliefs, attitudes, opinions, etc. to develop more ties amongst one another due to these similarities than they do with network actors who hold different beliefs (Leifeld & Schneider, 2012; Mcpherson et al., 2001). It is based on *homophily*, which is “the principle that a contact between similar [actors] occurs at a higher rate than among dissimilar [actors]” (Mcpherson et al., 2001, p. 416). Along with social influence, social selection is a predominant network mechanism that is often mobilized in theoretical explanations of networks (Gremmen et al., 2017; Kossinets & Watts, 2009; Lusher & Robins, 2013b; Tindall, 2014).

To clarify these two processes, we can contrast social selection with social influence.

Considering social selection, we can say that two actors in a policy network may share some beliefs, values, or stances on policy, and once learning that they share these traits, may choose to come together to form a connection. In this case, the network connection is formed *as a result of* beliefs or policy positions held by actors independent of their network connection. Considering social influence we can say that two actors in a policy network who may not share some beliefs or policy positions may be engaged in a network connection, and as a result of interacting with one another, one actor is influenced by the other and changes their beliefs or policy positions as a result of the processes of social influence outlined above. This is different from social selection because the shared belief or policy position arises *as a result of* social influence that is mediated through a network connection.

Generally, social selection and social influence occur simultaneously in social networks and can be difficult to distinguish, especially in cross-sectional analyses (Marsden & Friedkin, 1993;

Shalizi & Thomas, 2011; Snijders et al., 2010), which is utilized in this dissertation. However, while these two processes are generally co-occurring, they do offer “competing explanations” (Marsden & Friedkin, 1993, p. 144) for observed network patterns. This allows researchers to consider alternate explanations for observed networks based in theories or frameworks that are rooted in either social selection or social influence, hence why one major dimension of the theoretical problem addressed in this dissertation involves trying to better understand the different roles that social selection and social influence play in the formation of political network structure, and the policy positions network actors hold, in the context of climate change policy networks in Canada. Social influence is also implicated in considerations of policy discourse.

5.4 Policy discourse and social influence

Political discourses involve “verbal interactions between political actors about a given policy” (Leifeld, 2017, p. 302). As such, political discourses involve various types of actors engaging in public statements about their positions on particular policies, or their preferred policy instruments (Leifeld, 2017). Moreover, print news media continue to be an important arena that climate change policy actors use to engage in policy debates (Stoddart, Tindall, et al., 2017).

The literature on the relationship between media and policy from the fields of agenda setting (van Aelst, 2014; Vliegenthart, Walgrave, Baumgartner, et al., 2016a; Vliegenthart, Walgrave, Wouters, et al., 2016; Walgrave & Vliegenthart, 2012), policy networks (Kukkonen et al., 2018), and social movements (Gamson, 2007; Malinick et al., 2013; Meyer & Minkoff, 2004) offers some insights into the relationship between political discourse and social influence. For example, one insight is that the more media coverage social movement network actors are able to garner,

the more influential they should be perceived by other actors in the policy sphere. Social movement actors have strong incentives to pursue media attention given their position outside of existing institutional and political structures (Fogarty, 2011; Grant, 2004). They also tend to rely on media coverage to mobilize influence and garner public support (Stoddart, Tindall, et al., 2017; Vliegenthart, Walgrave, Baumgartner, et al., 2016a; Vliegenthart, Walgrave, Wouters, et al., 2016; Walgrave & Vliegenthart, 2012). In this dissertation I utilized discourse network analysis combined with theoretical insights about framing in political debates drawn from the social movements literature, to interrogate this link between social influence and political discourse, and specifically as it relates to environmental social movement actors

5.5 Discourse network analysis and social movement framing

Discourse networks are networks that are comprised of structured relationships between policy network actors on one hand, and themes that occur within the political discourses these actors are engaged in on the other hand. This kind of network is called a rectangular, two-mode, or bipartite network, since it includes two sets of network nodes (Borgatti et al., 2013; Knoke & Yang, 2008) – in this case, policy actors on one hand, and media themes on the other. It is rectangular because the number of nodes in one set generally does not equal the number of nodes in the second set.²⁹

²⁹ A two-mode network can also be used to derive two additional separate networks of the indirect ties among the nodes from one dimension of the network, through the nodes in the other dimension (Borgatti et al., 2013; Knoke & Yang, 2008). For example, if we consider a two-mode network of policy network actors and media themes, we can derive one network of policy actors who are indirectly connected through a media theme (because both of the actors are affiliated with the same media theme in the two-mode network), and one network of the indirect ties among media themes (because they are affiliated with the same actor(s) in the two-mode network).

As mentioned earlier, social movement actors are common participants in political discourses, and nodes in discourse networks (e.g. Stoddart et al. 2016). To study discourse networks researchers often use discourse network analysis (DNA), which was summarized in Chapters one and three. The DNA approach involves studying political discourses using the tools of social network analysis.

In this dissertation I built on the work of Stoddart and colleagues (Stoddart, Haluza-DeLay, et al., 2016; Stoddart, Tindall, et al., 2017) who studied climate change discourses in Canadian news media. For example, Stoddart, Smith and Tindall (2016) used DNA to show how social movement activists used the 2015 COP climate meeting in Copenhagen to reframe political debates, and challenge Canada's international reputation as a climate leader, bringing attention to Canada's poor climate change performance. Similarly Stoddart et al. (2017) used DNA to show how in Canadian climate change policy networks, even though environmental organizations were quite visible in news media, their policy positions were not reflected in actual policy outcomes, whereas fossil fuel corporations who were comparatively absent from news media had their policy preferences reflected in policy outcomes. In this dissertation I expanded on this body of work to incorporate an empirical analysis of perceived policy influence of Canadian climate change policy actors linked to political discourse texts. This analysis made use of the social-psychological understanding of social influence outlined earlier in this chapter.

One of the most common techniques that environmental activists use in their attempts to steer policy debates is called framing. Framing is the process whereby social movement actors seek

out media attention and strategically frame³⁰ particular events or policy issues to try to shape how the public understands these issues, and to try to gain support from the public (Benford & Snow, 2000). Frames are interpretive frameworks (sometimes called mental schemata) that people use to help them interpret reality (Benford & Snow, 2000; Snow et al., 1986; Taylor, 2000).³¹ As such, framing is an active communication process that involves contention at the level of how individual people perceive their day to day realities (Benford & Snow, 2000).

Researchers study framing processes by looking at how activists diagnose the cause of an issue and assign responsible to other actors, and motivate the public to support their cause by highlighting how the parties involved in an issue will be negatively impacted (Benford & Snow, 2000). Researchers also study the kinds of solutions activists propose for remedying an issue (Benford & Snow, 2000). Then, scholars analyze how activists articulate and mobilize these frames in the framing process, which occurs in political discourses, often in news media (Benford & Snow, 2000; Cormier & Tindall, 2005; Corrigan-Brown, 2016; Doyle et al., 1997; Howe & Wilkes, 2018; Stoddart et al., 2015).

³⁰ There are three core framing tasks (diagnostic, prognostic, and motivational framing) and four core framing processes (the amplification, bridging, extension, or transformation of frames), any of which may be involved in the framing process (Benford & Snow, 2000; Snow et al., 1986; Taylor, 2000).

³¹ Social movements tend to utilize two types of frames – master frames, which relate to general principles not specific to any particular context or situation (such as the notion of justice, equal rights and opportunities, or other notions of good and evil), and collective action frames, which draw from principles within master frames to articulate interpretations of specific issues or situations, such as the collective action frame of environmental justice (Benford, 2013).

To demonstrate these framing processes, consider how they might be used by environmentalists in Canada with respect to the issues surrounding the development of fossil fuels, and specifically with respect to the proposed expansion of the Trans Mountain oil pipeline.³² An environmental organization might engage in the following diagnostic framing: *‘The expansion of the pipeline by Trans Mountain and the federal government will result in further emissions of greenhouse gasses, leading to further destruction of the environment. Moreover, the project does not respect Indigenous rights’*. They might then use the following prognostic framing: *‘The pipeline project must be scrapped and stronger regulations for industrial emitters put in place. If regular channels of political pressure such as lobbying are not effective, we need to engage in collective action/civil disobedience’*. Finally, they might then use the following motivational framing: *‘it is a moral duty incumbent upon all of us to ensure the preservation of our environment for a number of reasons including future generations, aesthetics, biodiversity, etc.’*.

As summarized in the introductory chapter, framing is one of the main factors researchers tend to use in explanations of social movements, others include being political opportunities and mobilizing structures (including the mobilization of resources) (McAdam, 2017; McAdam et al., 2012). As McAdam (2017) suggests, political opportunities and mobilizing structures are necessary conditions for collective action by social movements, but they are not sufficient on their own. The process of framing in political debates is required to build a foundation of “shared meanings and cultural understandings” (McAdam, 2017, p. 194) to mobilize the emotional and cognitive dimensions of individual peoples’ lives, spur them into feeling angry, aggrieved, or

³² These are hypothetical examples that I constructed for illustrative purposes.

threatened about an issue and also optimistic that they can collectively redress the issue through collective action (McAdam, 2017; McAdam et al., 2012).

In the next section, I will briefly summarize how each of the three analytical chapters approached the overall problem outlined earlier in this chapter. I outline the theoretical perspective(s) used in each chapter, drawing from the summary presented in this section. Then, I summarize key findings from the analyses that speak to the general problem. Finally, I discuss some of the limitations of the research carried out in this dissertation, and suggest some avenues for future research.

5.6 Summary of chapters

5.6.1 Chapter 2: Social structure and social influence

One of the main foci of policy network analysis is how social structure and social influence are related (Ingold & Leifeld, 2016; Knoke, 1990; Laumann & Knoke, 1987; Marsden & Friedkin, 1993). In Chapter Two I utilized several analytical techniques to examine how a network actor's structural location in terms of degree centrality may be used as a proxy measure for their level of social influence. I investigated the role of subgroups – specifically the 'core' and 'periphery' of a network, where actors in the core are more central and more interconnected than actors in the periphery – and membership in substantive communities, to better understand how these groupings were related to social influence across five policy networks, divided into two network types – interactional networks and influence networks.

I found that there were correlations amongst the different networks, and the correlations were moderately strong, but there were different patterns of actors that are central (i.e. in the core) across the networks. More specifically, while subgroups comprised mainly of research and environmental actors were central within networks related to collaboration, communication, and sharing scientific information, they were less central in the two networks related to perceived policy influence. In contrast, subgroups composed of business and government actors were less central in collaboration, communication, and scientific information networks and highly central in the perceived influence networks. These findings present a challenge to generally accepted principles of network theory in that, in some cases, actors who were more central in one of the networks did not tend to be more central in all of the networks.

We can draw on the understandings of social influence described in Chapter One in interpreting these findings as well. For example, drawing on the structural understanding of influence related to degree centrality suggests that research and environmental actors have a higher potential for mobilizing influence in the interaction climate change policy networks, and a lower potential for mobilizing influence in the influence networks. The converse is true for business and government actors who have a lower potential for mobilizing influence in the interaction networks, and a higher potential for mobilizing influence in the influence networks.

We can draw from the social-psychological understanding of influence as well – in this case, in terms of influence networks. This suggests that research and environmental actors are not perceived to be influential compared to other actors, whereas business and government actors are perceived to be influential. These findings are supported by other work (unpublished at the time

of writing) completed by the Canadian COMPON team looking at other aspects of the relationships between social structure and social influence. In this work, researchers found that research related actors were perceived to be the least influential actors in the policy network, and that business and government actors were perceived to be more influential (Tindall, 2019). In sum, Chapter Two of this dissertation provides insights into the social-structural and social influence related processes that form the context within which climate change policy making in Canada occurs.

5.6.2 Chapter 3: Political discourse and social influence

In Chapter Three I combined theoretical insights from the study of social movements – specifically those related to the use of media by social movement actors as a form of garnering public support and generating political influence – combined with aspects of social network theory related to structural position and social influence similar to those used in Chapter One, but focused specifically on degree centrality in a policy network as a measure of an actor’s perceived influence in a policy network. I also relied on theoretical assumptions about political discourse drawn from the literature on discourse network analysis to inform how I operationalized the aspect of this chapter related to political discourse – in this case, the amount of climate change related media coverage actors received.

I analyzed how different substantive groups of actors shared similar types of coverage, and whether this coverage aligned with the prevailing political-economic landscape in Canada. I also analyzed how media coverage for environmental actors was related to the amount of influence these actors were perceived as having by other actors in a climate change policy network. This

chapter speaks directly to the central theoretical problem of this dissertation as it focuses on how social influence, understood as structural position, is related to political discourse about climate change in Canada. Chapter Two contributes to answering this question by uncovering how being an environmental actor can intervene in, and shape, the association between political discourse (media coverage) and social-structural network processes (perceived policy influence).

5.6.3 Chapter 4: Micro-structural network processes, and policy positions

In Chapter Four I combined aspects of social network theory related to micro-structural network processes (such as reciprocity and transitive closure) with the advocacy coalition framework (ACF), which is a policy network framework that prioritizes the beliefs held by network actors as the primary explanation for policy network behaviour. Chapter Four addresses the main theoretical problem of this dissertation in two ways. First, it centres the analysis on the social dynamics of climate change policy making, rather than on explaining successes and/or failures of particular policy efforts – an issue I identified as being common to much of the literature of policy networks. Second, in the chapter I analyzed how micro-structural network processes were related to the policy positions that network actors held on key policy issues, bringing social network theory related to social influence to bear on the ACF, which is primarily a social selection framework.

In combining these two streams of literature, Chapter Four addresses the main problem of this dissertation by examining how social-structural network processes are related to policy positions of network actors. This contributes to our understanding of climate change policy making processes. In the sections that follow, I synthesize the research results from the three empirical

chapters outlined above to explore some potential answers to the main theoretical question posed in this dissertation.

5.7 Summary and synthesis of key research findings

5.7.1 Finding #1:

In Canadian climate change policy networks, being a central actor in networks related to collaboration, communication, and sharing scientific information is not necessarily associated with being a central actor in networks related to perceived influence.

As summarized in the introductory chapter, the literature on social networks generally suggests people who are central in one network will be central in another. In other words, there tends to be a certain level of symmetry across different dimensions of network relations (for example, the dimensions of communication and collaboration). In terms of social influence, higher centrality is seen as related to a higher potential to mobilize influence within a network. As noted earlier, this is a key way that power works in social networks (Tiziana Casciaro & Piskorski, 2005; Henry, 2011; Ingold & Fischer, 2014; Ingold & Leifeld, 2016; Stoddart, Mattoni, et al., 2020; Stokman & Zeggelink, 1996). In Chapter Two I presented results of a QAP correlation and found that, in line with this general statement, the five networks were significantly correlated; however, I also found that the most central actors in the interaction networks were not the most central actors in the influence networks. This suggests that in Canadian climate change policy networks, there are partial disconnects, or asymmetries, between potential influence in networks of collaboration, communication, and sharing scientific information on one hand, and potential

influence in terms of domestic policy making, or in terms of the organizations involved in policy making.

Specifically, I found that when only the two influence networks were considered, the distribution of instances of representation of communities in the network cores was dramatically skewed such that actors in business and government substantive communities were most represented followed by environmental actors, research, and think-tanks. Similarly, when just the interaction network cores were considered, the distribution of instances of representation of subgroups was inverted such that actors in substantive communities related to research were most represented, whereas those related to business and government were least represented. This suggests that, while there is space for research-based actors for climate change communication, collaboration, and dissemination of scientific knowledge, these research-based actors are not perceived to be especially influential.

The findings in Chapter Three support this interpretation and offer some specificity with respect to types of actors under consideration. In Chapter Two network actors were assigned one of eight possible actor ‘types’ based mainly on their sector membership (for e.g., civil society, academia, government, business, etc.), and the type of activity they undertook (for e.g., activism/advocacy, research, governing, business, etc.). I analyzed how actor type was associated with the amount of media coverage an actor received, and the nature of the association between media coverage and perceived policy influence, specifically for environmental actors.

Although the full range of complexities of policy networks may not be captured in mediated policy debates, and although actors differ in their need for, and ability to garner media coverage (Stoddart, Tindall, et al., 2017; Stoddart, Ylä-Anttila, et al., 2017), news media is a good place to study how the actions of policy network actors relates to influence in policy making. News media remains a primary arena where policy actors engage in contentious discourses (Benford & Snow, 2000; Leifeld, 2017), and policy actors are often able to mobilize and exert influence on policy makers in part through news media coverage (van Aelst, 2014; Vliegenthart, Walgrave, Wouters, et al., 2016).

I found that when compared to government actors (which acted as the reference category), for individual environmental activists and research-related actors, there was a negative association between media coverage and perceived policy influence. In contrast for environmental movement organizations there was a positive association, and for think tanks, the effect was no different than for government actors. This suggests that the disconnect between interaction networks and influence networks is partly related to the type of actor under consideration.

This is important considering the role that scientific information plays in the policy process – how it gets disseminated to policy makers, and how it is used (or not used) to inform and shape policies - issues commonly taken up in work on the ‘science-policy interface’ (Hickey, Forest, Sandall, Lalor, & Keenan, 2013; Kukkonen & Ylä-Anttila, 2020; Lacey, Howden, Cvitanovic, & Colvin, 2018). There are three important aspects that contextualize this process of mobilizing and using scientific information: the existence of trust, communication, and collaboration (Hickey et al., 2013; Lacey et al., 2018). While I do not have direct data on trust, I do have

information on communication and collaboration, both of which do not appear to translate well into perceived influence in policy making.

However, recall that in Chapter Three I found a positive association between media coverage and perceived policy influence for environmental NGOs (and an effect for think tanks that did not differ significantly from government actors) as compared to individual activists who had a negative association between media coverage and perceived policy influence (even though they were affiliated with an environmental organization). I suggested that this finding may be explained in part to some level of institutional legitimacy afforded to environmental organizations (and potentially to think tanks), allowing them to mobilize influence in policy making by gaining “insider status in institutions or in organizations that initiate, prepare, legislate, or execute policy change” (Lang, 2013, p. 22). In terms of the mobilizing of scientific information, there may be some space for environmental NGOs to act as network ‘bridges’ – actors that connect two components of a network that are otherwise not connected together (Borgatti et al., 2013; Knoke & Yang, 2008; Richards, 2018).

In terms of the third aspect of the context surrounding processes of mobilizing and using scientific information – the existence of trust (Hickey et al., 2013; Lacey et al., 2018) – I don’t have direct data on trust; however, trust is a “psychological state that is context-specific” (Lacey et al., 2018, p. 22); thus it seems reasonable to consider trust alongside a social-psychological understanding of social influence. I want to suggest here that the institutional legitimacy tied up with ‘insider status’ suggested earlier might afford policy makers a heuristic to quickly deem environmental NGOs (and possibly think tanks) as trustworthy, and individual activists and

research-related actors who do not have ‘insider status’ as inherently untrustworthy, in the context of climate change policy making in Canada. This also supports the suggestion that environmental NGOs (and possibly think tanks) may act as bridges between those research related actors perceived as less influential, and the policy actors perceived to be more influential. I expand on this in the section on future research, below.

Another factor that is important to consider is highlighted in Chapter Three – mainly, the relationship between micro-structural network processes and policy beliefs held by network actors, and their role in explaining climate change policy networks in Canada.

5.7.2 Finding #2:

Whom a network actor interacts with is partly related to their policy position, and partly related to micro-structural network processes.

Chapter Three of this dissertation highlights the second main finding of this dissertation – that whom a network actor interacts with in a policy network is partly related to their policy positions or beliefs, and partly related to underlying micro-structural network processes. This is a more nuanced research finding than it may appear at first. Chapter Three involved using exponential random graph analysis (ERGM). This kind of analysis involves explaining “the formation of social structure through the accumulation of small local substructures and, ultimately, through the formation of individual ties into the patterns of those substructures. (Lusher & Robins, 2013a, pp. 16–17).

In Chapter Three I found that the likelihood a network tie between two policy actors was associated with certain micro-structural network processes – specifically, the processes of reciprocity, structural equivalence, and transitive closure. Reciprocity is theoretically informed by established theories of basic human activity (Lusher & Robins, 2013a). Structural equivalence and transitive closure are heavily informed by network theory related to triadic relations, structural balance, network closure, and theories of prominence and popularity, among others (Lusher & Robins, 2013a).

One general principal often found throughout the literature on policy networks is that agreement between two actors on a policy issue tends to be associated with a higher likelihood of a network tie between these actors, and particularly so if the issue is a contentious one (Tarrow, 2011; Weible & Jenkins-Smith, 2016). This argument is theoretically based in the principle of homophily (Mcpherson et al., 2001). ERGM analysis is also about “revealing patterns that may enable inferences on tie formation processes, including social selection processes where network ties are predicted from the attributes of the network actors” (Lusher & Robins, 2013a, pp. 16–17). My research findings in Chapter Three support this principle. I found that agreement between two actors in a collaboration network about a number of contentious policy issues was associated with a higher likelihood of a network tie between these actors. In addition, I found that the positions of network actors with respect to the desirability of carbon pricing in Canada was associated with a *lower* likelihood of a network tie, all else being equal. This challenges the basic assumption that belief homophily is associated with the formation of network ties. Beyond shared beliefs, other contexts need to be considered when studying policy making.

5.7.3 Finding #3:

Overarching political context must be taken into account when analyzing policy making.

With respect to the finding of policy beliefs related to a carbon tax mentioned above, I argued in Chapter Four that this was partly due to the fact that the question of a carbon tax in Canada is largely settled and no longer a major issue of contention within the Canadian climate change policy network. This highlights how overarching political landscapes form the arena for policy networks and shape the dynamics of social structure and social influence that give rise to policy networks (Ylä-Anttila et al., 2018). In terms of understanding processes of policy making through the lenses of social structure and social influence, the framework of theories and methods often used with ERGM analyses is not sufficient on its own, and other considerations such as those suggested by the findings related to carbon pricing in Chapter Four related to overarching political contexts, need to be taken into account. Moreover, contexts such as those analyzed in Chapter Three related to political discourse need to be incorporated as well.

This represents an important extension to the understanding of social influence from extant literature on policy networks. In Chapter Two, instead of focusing on endogenous (internal) factors related to structural network processes, I centered exogenous (external) factors related to political discourse in my examination of the empirical correlation between media coverage of different policy network actors and the perceived influence of these actors in a policy network. I argued my findings underscore the need to consider alternative processes related to overarching contexts. For example, media coverage may not always be associated with influence due to a

number of factors, including journalistic norms (Boykoff & Boykoff, 2007; Callison, 2014), the complex nature of policy networks, which cannot fully be captured in mediated policy debates (Stoddart, Tindall, et al., 2017), and the variations between policy actors in terms of their need for media coverage, or their ability to garner media coverage (Stoddart, Tindall, et al., 2017).

At the same time, any examination of the policy making process that leaves out considerations related to micro-structural network processes such as those examined in Chapter Four also miss key aspects of the policy process related to social structure and social influence. These processes govern network behavior and are always at play, often without the express awareness or understanding of network actors (Borgatti & Halgin, 2011). For example, as explained in Chapter Two, policy networks can function as social capital structures within which media actors may be implicated, and who rely on these existing network connections (regardless of overarching contexts) to identify their news sources (Malinick et al., 2013).

In the next section, I outline some of the limitations of the research carried out in this dissertation. I end this chapter with a discussion of some recommendations for future research, drawing on the key findings thus described.

5.8 Limitations

The analyses done in this dissertation have some limitations as they are based on data gathered through a single case cross-sectional design. The main limitations that apply to all cross-sectional designs also apply to this dissertation. The first is the fact that cross-sectional research designs only capture a snapshot of one specific time and it is not possible to study change across time,

and the second is that the results may be affected by patterns of non-response (Babbie, 2015). A third limitation of this dissertation is the focus on national scale.

This first limitation related to time is of particular importance to the question of social selection versus social influence, since as noted earlier, social selection and social influence are both occurring at the same time, and as a result can often be confounded in cross-sectional social network studies (Marsden & Friedkin, 1993; Shalizi & Thomas, 2011; Snijders et al., 2010). For example, an observed network may have arisen primarily through processes either of social selection or social influence, or variables that are heavily implicated in either of these processes may have been omitted or incorrectly measured which could have led to spurious findings (Marsden, 1990; Marsden & Friedkin, 1993).

For example, as summarized in Chapter Four, in an experimental study of how social influence through network connections leads network actors to change their stance Friedkin (1999) found that opinion changes were partly a result of external sources of influence such as exposure to mass media. Friedkin's study involved individual people, whereas the analyses in this dissertation pertain to organizations, but the general principles should still apply. For example, it is possible that some of the policy actors in the data analyzed in this dissertation could have had network ties to other policy actors not observed in my study (for example they could have been engaged in collaboration or regular communication). Another possibility that pertains to the findings in Chapter Three is that the amount of exposure to mass media policy actors had, and the importance these organizations place on media discourse too shape or inform their own policy positions, were not directly observed. While there is no way to eliminate these potential

issues, there is little evidence to suggest that these issues intervened in the analyses in this dissertation.

Moreover, the claims I have made in terms of findings and discussion do not involve specific claims about the direction of causality, which would require a temporal component (Babbie, 2015). One way to overcome this time-related problem is to undertake a kind of analysis specifically designed to study change over time, such as SIENA (Snijders et al., 2010).³³ However, this would require collecting longitudinal panel data, which is challenging and time consuming, and thus not practical for the current analysis, though it should be noted that some other country case teams within the COMPON project are undertaking some longitudinal analyses as of the writing of this dissertation. I expand on the possibility of longitudinal analysis in the section on future research, below.

The second potential limitation is the existence of actor nonresponse,³⁴ since there was some limited nonresponse on some of the survey questions (Costenbader & Valente, 2003; Huisman, 2014; Huisman & Krause, 2017; Huisman & Steglich, 2008; Kossinets, 2006; Kossinets & Watts, 2009; Krause, Huisman, Steglich, & Snijders, 2020, 2018). In this dissertation I employed listwise deletion, also called complete case analysis, reducing the policy networks in size, to reflect the fully observed subsamples (Huisman & Steglich, 2008). The total number of surveys

³³ SIENA – or Simulation Investigation for Empirical Network Analysis – is a form of modelling network dynamics based on the assumption that networks evolve through stochastic actor-driven processes, and especially processes whereby network actors make decisions about, and change, their network ties over time (Snijders et al., 2010).

³⁴ For a discussion of the types of nonresponse in network studies, including actor, tie, and item non-response, see (Huisman & Steglich, 2008).

that were fully or partially completed was 59 (44 fully completed, and 15 partially completed). The response rate based on the number of at least partially completed surveys as a function of the total number of interviews was 57%, and as a function of the original sampling frame was 40%.

Nonresponse can, but does not always, lead to nonresponse bias, and there is evidence suggesting that even samples with extreme levels of nonresponse may still produce accurate estimates in some cases (Wright, 2015). However nonresponse can be more problematic when considering network research, given the interdependent nature of network data; the nonresponse of one member of a network results in missing data for all members of a network (Krause et al., 2020).

A number of strategies have been investigated for addressing this issue in network studies (de la Haye et al., 2017; Huang, Zhang, & Li, 2019; Huisman & Krause, 2017; Krause & Caimo, 2019; Krause et al., 2020, 2018; Krause & Snijders, 2018; Smith, Moody, & Morgan, 2017). As Krause et al. (2020) summarize, the some of the common basic methods of addressing missing data used in network studies include “listwise or pairwise deletion, [or] imputation of no-ties, as most social structures are sparse (density < .5) and no-tie being the most likely value” (p. 101). I employed listwise deletion in some of my analyses to achieve fully observed subsamples. Although listwise deletion has the potential to remove a large amount of data given dependency of network data, this method “can be an adequate missing data treatment if only a small amount of nodes is affected” (Krause et al., 2020, p. 101). I argue that this is the case in my data. As Krause et al. (2020) mentioned, most social structures are sparse, with densities (the total number of ties divided by the theoretical maximum of potential ties) below 0.5. The highest density of

the five networks analyzed in this dissertation was 0.11, and all other networks had density of 0.08 or lower (see Table 2.1). Moreover, the sample for the data analyzed in this dissertation was designed to be fairly representative of the most important policy actors in Canada, and the data come from a significant diversity of these actors.

With this mind, replication of my analyses could be done using other approaches of dealing with missing data in cross-sectional network studies, such as likelihood-based estimation using ERGM methods to leverage observed network level characteristics to model/reconstruct missing network ties (Handcock & Gile, 2010; Koskinen, Robins, Wang, & Pattison, 2013), and multiple imputation of missing data using random imputation proportional to the density observed in the network – in other words, when imputing missing ties, the probability of a tie would equal the observed density of the network (Huisman, 2014; Huisman & Krause, 2017; Žnidaršič, Doreian, & Ferligoj, 2012). Another possible approach would involve a hypothetical future study similar to mine, but altered such that the data being collected would be egocentric rather than whole network data, which was used for this dissertation. In contrast to designs using whole network data that consider the set of actors under examination to be representative of the complete real-world network, egocentric designs focus on the patterns of network relationships specific to sampled network actors (Box-Steffensmeier, Christenson, & Morgan, 2018; Krivitsky & Morris, 2017; Marsden, 1990).

The third limitation is the focus on governance at the national scale, given that governance Canada encompasses national, provincial, and municipal levels (including some important regional aspects as well). It is possible that there exist important multi-level processes that shape

climate change governance in Canada, such as different flows of visibility or influence between national, provincial, and local political arenas. Readers should keep this in mind when interpreting my results.

In sum, there are limitations inherent to cross sectional studies that need to be considered in interpreting the findings and discussions in this dissertation. Readers need to bear in mind the thorny problem of social selection and social influence, and acknowledge the fact that it is nearly impossible to separate out the contributions of one or the other in giving rise to observed networks (Friedkin, 2015; Friedkin & Johnsen, 1999, 2011; Marsden & Friedkin, 1993). Readers should also keep in mind the potential for external, unobserved processes of influence (Marsden & Friedkin, 1993). I acknowledge that my results, like most social science research, might be affected by biases associated with missing data as a result of non-response. I have discussed some ways in which this could be accounted for in future research. I also acknowledged that my analyses focus on the national level, which means that some multi-level processes may have been missed. I now turn to a discussion of some potential paths for future research.

5.9 Potential paths for future research

In Chapter Two of this dissertation I undertook a descriptive analysis of five climate change policy networks in Canada. This helped prepare a base of knowledge about the networks that informed subsequent chapters; however, more can be done with this kind of analysis. One possibility is considering the findings in terms of the science-policy interface (SPI), which describes the roles and network connections that characterize the gap between policy decision

makers on the one hand, and actors engaged in producing decision-relevant climate change science on the other (Chilvers & Evans, 2009; Kettle, Trainor, & Loring, 2017).

The SPI has previously been used in some COMPON-related research (Kukkonen & Ylä-Anttila, 2020; P. M. Wagner et al., 2021). For example Wagner et al. (2021) used ERGMs in a comparison across four countries to study the types of organizational actors that were favoured in the SPI and whether belief homophily shaped these network connections. They found that scientific actors were favoured across all SPI cases, and that belief homophily came into play in only one case. Kukkonen et al. (2020) conceptualized the SPI in terms of a discourse network to study the roles of, and relationships between, scientific actors and arguments related to climate change policy in Finland. They found that two prominent competing discourse coalitions characterized the SPI – one economic coalition prioritizing economic growth over climate change mitigation, and one climate coalition prioritizing mitigation over economic growth. Moreover, initially the economic coalition dominated, but over time the SPI shifted such that the climate coalition was dominant.

Similar applications of the SPI literature could extend the analyses in this dissertation. In Chapter Two I found evidence of a disconnect between the interaction networks and influence networks, in that research related actors were central in the interaction networks and less central in the influence networks. Applying an ERGM approach informed by the SPI similar to that used by Wagner et al. (2021) could reveal whether policy beliefs play any significant role in the observed disconnect. In Chapter Three I found evidence that as the percentage of a network actor's media coverage pertaining to business-related themes increases, so does their level of perceived

influence (see Table 3.4). This could be evidence of a dominant economic discourse coalition similar to that described by Kukkonen et al. (2020). Applying the framework used in their analysis could reveal much about the discursive structure of the SPI in Canada.

Another path for future research involves extending the analyses in this dissertation in a comparative context. As mentioned in the introduction, the COMPON project is a large international project involving multiple countries. There is a strong tradition of comparative analyses already in the COMPON project, primarily in terms of content analyses of the framing of climate change discourse in media data (Broadbent et al., 2016, 2013; Ylä-anttila et al., 2018), or analyses of discourse networks or discourse coalitions related to climate change discourse in media data (Kukkonen, Stoddart, & Ylä-Anttila, 2021; Kukkonen et al., 2018). A smaller subset of this comparative work takes a policy network approach looking at macro-level contextual aspects of politics and how they are related to the policy beliefs and positions of actors in climate change policy networks (Gronow, Ylä-Anttila, Carson, & Edling, 2019), and how similarity of policy beliefs among actors in climate change policy networks shapes the exchange of climate change related scientific information in those networks (Wagner et al., 2021).

The analyses in Chapter Three have yet to be undertaken in a comparative framework in the context of climate change policy networks. Drawing on the analysis in Chapter Two, comparing the structural patterns of climate change policy networks across countries could yield significant insights into a number of facets of climate change governance, such as how different political systems, different political-economic structures or energy bases, or different media ecosystems

might be associated with different network structures, which, as this dissertation shows, can have significant implications for the process of climate change policy making.

A comparative extension of the kind of analysis done in Chapter Three could illuminate how different media ecosystems shape the relationship between media coverage and perceived policy influence, and the types of actors that appear to benefit (or not benefit) from media coverage. Extending the analysis in Chapter Four in a comparative context has significant potential for furthering understandings about how different political institutions, energy bases, or media ecosystems are related to the kinds of network processes that underly climate change policy networks and the policy beliefs network actors have, and how these network processes and policy beliefs come together in the formation of these networks.

Previous research has refined theoretical arguments about whether corporatist countries enact more ambitious climate change policies by comparing climate change policies between Finland and Sweden, both of which are corporatist countries, but the latter of which has more ambitious environmental policies (Gronow et al., 2019). This analysis looked at the existence of subgroups, the level of consensus of beliefs related to climate change policy, and how inclusive the networks were based on the distribution of perceived influence (where a more even distribution was associated with more inclusiveness). However, the energy bases of these two countries are fairly different – in Sweden, about 31% of the country's energy comes from fossil fuels and 69% from renewables, whereas these percentages in Finland are about 55% fossil fuels and 48%

renewables³⁵ – and these differences could be a significant factor in explaining policy network processes such as inclusiveness and consensus.

For example, it is possible that some subgroups associated with particular energy sectors may be more or less influential depending on their relative weight in a country's energy portfolio, or that the structures of policy networks are related to differences in these energy bases in other ways.

For example, we could consider a comparison between Canada, Finland, and Sweden. In Canada, about 66% of the country's energy comes from fossil fuels, and about 34% from renewables. A future study could assess the dimensions of corporatism that characterize Canada as per Gronow et al. (2019), and assess the extent to which differences in the energy bases of these countries are associated with differences in corporatism and climate change policies. If we refer to the CCPI introduced in Chapter One, Finland is ranked 14th, and Sweden 5th (compared to Canada in 61st place). This suggest that there are some important interactions among energy base, corporatism, and the ambition of climate change policies.

Another possible direction for future research involves leveraging the understanding of the structure of policy networks gained through the kinds of analyses done in this dissertation, and applying these insights into comparative investigations of policy outcomes. For example, to some extent in this dissertation I have been interested in the role of environmental movement actors in the climate change policy making process. I could expand on this general idea to compare differences in the effects that environmental movement actors may have in climate

³⁵ See <https://ourworldindata.org/energy/>

change policy outcomes, either through the framework of a media-policy link similar to that used in Chapter Three, or in terms of how they are integrated into different networks similar to chapters Two and Four.

Some of the directions for future research just outlined imply a requirement for longitudinal data, which represents another dimension of possibility for future research. Collecting longitudinal data would allow for stronger claims about the direction of causality within the suggested analysis summarized above. For example, previous research has demonstrated that changes in market liberalization can lead to changes in regulatory policy networks (Fischer, Ingold, Sciarini, & Varone, 2012).

Taking this basic premise and applying it to the studies suggested above yields ideas about how changes in the character of political institutions (such as corporatist, capitalist, etc.) impact media landscapes, and thus the link between media and policy, or how shifts in energy bases over time (for example shifts from an energy base heavily weighted toward fossil fuels, toward a more renewable base) might impact the structure of policy networks. On the other hand, perhaps changes in policy networks may generate political opportunities (McAdam, 2017; McAdam et al., 2012; Meyer, 2004; Meyer & Minkoff, 2004) and/or shifts in the landscape of mobilizing structures and available resources (McAdam, 2017; McAdam et al., 2012; McCarthy & Zald, 1977) that allow environmental social movement actors to increase their levels of policy influence.

Longitudinal analysis could also better specify the roles of social selection and social influence in Canadian climate change policy networks, and in a comparative context as well. As noted earlier, a SIENA framework could be used here. SIENA is a way of modelling networks that centres individual network actors and the choices they make over time about who they are connected to in a network (Snijders et al., 2010). Future researchers could involve gathering additional panels of the data on policy preferences and network data analyzed in this dissertation (and in other countries), which could be analyzed using a SIENA model to study the role of social influence and social selection in shaping the policy networks across time. When combined with additional contextual data about political opportunities and mobilizing structures, this kind of analysis could shed light on a number of questions. In terms of political opportunities and mobilizing structures, some may include changes in governments, the occurrence of major international climate change meetings, major incidents/disasters linked to climate change, changes in funding structures for environmental organizations, etc. In terms of questions, some include how cycles of international prominence of climate change governance, and ongoing awareness of the negative consequences of climate change, shape domestic climate change policy networks, including specifically the roles and prominence of research-related actors in the SPI.

Longitudinal analyses could also shed light on the links between policy networks and policy outcomes. It can be difficult to study how effective policy actors are in actually achieving policy outcomes for a number of reasons. For example, policies are complex, involve many dimensions and can apply across many domains; thus policies often succeed in some areas but are not effective in others (McConnell, 2010). Another complication in studying policy success or

failure is the fact that different actors will interpretant success and failure in different ways (McConnell, 2010). One method that has been used to investigate the effectiveness of interest groups in achieving policy outcomes that avoids some of these issues is to analyze the final text of policy documents (output) and compare this to policy positions of interest groups gathered from texts produced by these groups (Klüver, 2009). Another way if studying this is to look at how changes in policy networks over time (such as the development of particular advocacy coalitions, or shifts in membership of prominent coalitions) may be related to the success or failure of particular climate change policies. Factors such as those touched on above (different political systems, different political-economic structures of energy bases, or different media ecosystems) could be brought into these analyses as well.

Another path for future research involves further analysis of social influence. Recall that social influence may occur in many different ways. As outlined earlier, influence in policy networks is often understood in terms of social structure – either as an actor’s degree centrality, or as an actor’s membership in a subgroup based on similar patterns of network ties (structural equivalence) (Heaney, 2014; Ingold & Leifeld, 2016; Knoke & Yang, 2008). In this dissertation I also understand social influence social-psychologically, as a perception that network actors have about the level of influence other network actors have in policy making (Gartrell, 1987; Heaney & Lorenz, 2013). But there are some specific factors that may impact this subjective evaluation of the perceived influence of other actors. These factors are the level of formal decision-making authority that an actor possesses, and how embedded an actor is within the policy network (Ingold & Leifeld, 2016). The analysis done in Chapter Two of this dissertation partly bears on how embedded actors are in Canadian climate change policy networks by analyzing these

networks in terms of core-periphery. Future research could build on this work to analyze how actors in different structural positions are integrated vertically into the political system, thereby assessing different levels of formal decision-making authority, and how this is related to the level of influence actors are perceived to have (Ingold & Leifeld, 2016).

The name roster in the survey included the organizations in the sampling frame, as well as additional organizations and also key individuals. Because there were additional actors listed as targets beyond the organizations in the sampling frame, and because there was some non-response among organizations listed in the sampling frame, the resulting network data matrices were rectangular. For example, as discussed above, in the end, there were 44 respondents, and 171 targets. (Chapters Two and Four are restricted to analyzing data associated with the 44 respondents, but Chapter Three utilizes the additional rectangular data.)

This means that there is the potential to further analyse the rectangular network (this is somewhat similar to the two-mode networks described above in the section on DNA, but not quite the same, since all of the nodes in these networks would be of the same kind – that is, policy actors), where on one dimension of the network there would be the network actors who completed the survey ($N=44$), and on the other dimension would be all of the target actors ($N=171$), which include oil and gas companies and federal Conservative politicians. Future research could involve analyzing these outgoing ties from actors in the sample to oil and gas companies and federal Conservative politicians (among others), to study the structure of these network connections and how they may relate to aspects of social influence and political discourse similar to those analyzed in this dissertation. For example, outgoing ties to actor types such as

journalists, social movement activists, and representatives of international governance organizations could also produce fruitful insights.

Future research could also extend the media analysis herein beyond flagship newspapers to social media, which is increasingly used to study political questions (Barberá & Steinert-Threlkeld, 2020). Some work has already been done through the COMPON project investigating polarization of climate politics in Finland using Twitter data (Chen, Salloum, Gronow, Ylä-Anttila, & Kivelä, 2021). A similar analysis could be undertaken for the Canada case. This would also allow comparison with the Finnish case. Moreover, while there are some technical challenges related to gathering and processing social media data, it is arguably easier to produce robust analyses with social media data compared to the time required for a similarly robust analysis with legacy media data.

Use of social media such as Twitter does have some drawbacks, however. Twitter users are not representative of the general population – for example, as of January 2021 Twitter users in Canada represented about 20% of the total Canadian population, and in terms of gender, were about 38% female and 63% male.³⁶ Other studies have found Twitter users to be younger, more highly educated, and more politically-inclined than the general population (Chen et al., 2021). However, this may not be a significant issue if the intention is to study “a more politically sophisticated and active segment of the population” (Chen et al., 2021, p. 5).

³⁶ See slide #59 here: <https://datareportal.com/reports/digital-2021-canada>.

Social media data would also make longitudinal analysis of trends in policy discourse, and how these are related to changes in overarching contexts, more accessible. A longitudinal approach could facilitate taking a ‘media ecologies’ approach to communication and mediated policy networks. In this approach, the media landscape is viewed as an ecology with a finite ‘carrying capacity’ for different issues and information, which impacts the visibility of political issues over time (Jang & Pasek, 2015; McCombs & Zhu, 1995; Stoddart, Ramos, Foster, & Ylä-Anttila, 2021).

Another direction for future research also related to the media sphere involves looking at network connections that include journalists and activists to expand the findings in Chapter Three related to the surprising negative correlation between media coverage and perceived policy influence for individual environmental activists. For example, conducting the kind of structural analysis in Chapter Two and including outgoing ties could illuminate details of a ‘social capital structure’ (Tindall, 2014; Tindall & Wellman, 2001) mediating the relationship between social activists and media, as compared to the social capital structure mediated the relationship between media and more influential policy actors. It is possible that media actors embedded within social capital structures that include environmental activists may be absent from those that involve policy makers; social movements do tend to increasingly rely on alternative forms of media, and especially (Barberá et al., 2015; Callison, 2017; Callison & Tindall, 2017; Earl, Hunt, Garrett, & Dal, 2015; Moscato, 2016). Depending on the level of notoriety or legitimacy of the media outlets associated with these media actors, this could partly explain the finding described earlier.

Other factors that may impact these findings include structural or regulatory changes in media landscapes, the way that domestic think tanks and politicians represent key actors such as oil and gas actors,³⁷ and regional differences in confidence in political institutions to address climate change (Callison & Tindall, 2017). These are in addition to those factors discussed in this dissertation – journalistic norms (Boykoff & Boykoff, 2007; Callison, 2014), difficulty in capturing the complexity of policy networks in mediated debates (Stoddart, Tindall, et al., 2017), and the variations in actors’ need for media coverage or ability to garner media coverage (Stoddart, Tindall, et al., 2017).

Future research could also extend the analyses herein using a multi-level framework (Brunner, 2008; Bulkeley & Betsill, 2005, 2013; Francesch-Huidobro, 2012; Rootes, Zito, & Barry, 2012; Stoddart & Tindall, 2015; Stoett, 2012). As noted in the limitations section, this dissertation focuses on the national level. However, the data includes actors at all three levels of government. Future research could use a multi-level framework to study how the relationships examined herein with respect to the characteristics of actors focussed on in this dissertation differ at different levels of government. Combining this with a longitudinal approach could be especially useful for studying how different actors might leverage connections at different levels of government. For example, actors who have their policy advocacy blocked at one level may find their efforts more successful at other levels.

³⁷ Readers should bear in mind here that oil and gas actors are not inherently obstructive actors in the climate change policy sphere, and are not inherently opposed to climate action. Rather, it is an empirical question as to how the Canadian oil and gas sector and the government choose to respond to and navigate globally emerging energy futures, and what kind of energy future orientation they adopt (for a good discussion on this, see Stoddart, McCurdy, Slawinski, & Collins, 2020)

5.10 A note about climate change issues and Indigenous communities in Canada

When considering political issues in Canada, and especially those related to resource extraction and climate change, it must be recognized that Canada is a colonial state that was built in a large part by the wealth – in terms of lands and resources – that were stolen from Indigenous peoples³⁸ either through force, or through treaties that were written to greatly favour colonizers (Callison, 2014; Coulthard, 2014). As such, when questions about climate change policy arise in Canada, Indigenous peoples are always implicated given their histories with colonialism, and because at its base, climate change is about land and resources (Barker, 2015; Callison, 2014; Whyte, 2017).

Here I want to acknowledge two important facts. The first is that Indigenous peoples have a strong history of mobilizing in efforts to address climate change (Goldtooth, Saldamando, & Gracey, 2021). In fact, this mobilizing has either halted or delayed GHG pollution “equivalent to at least one-quarter of annual U.S. and Canadian emissions” (Goldtooth et al., 2021, p. 1). The second fact I wish to acknowledge is that the perspectives of Indigenous people are not well represented in this dissertation. When the study was underway, one important organization was reached out to, but they did not respond. There are a variety of possibilities for this, but limited capacity to respond to numerous requests is one possible explanation.

³⁸ Neither Indigenous peoples nor non-Indigenous peoples are homogenous groups, and it is troublesome to speak with language that suggests this kind of binary since it could lead to inaccurate understandings of the diversity of communities and identities within these groups. In fact, both of these groups are composed of numerous communities with diverse cultures, viewpoints, and positions on climate change and climate change policy.

When approaching Indigenous communities and organizations for inclusion in a study, researchers need to bear in mind the history of non-Indigenous researchers conducting research ‘on’ or ‘about’ Indigenous peoples rather than ‘with’ Indigenous peoples, and largely for the express benefit of the researcher (Coburn, 2013; Tuck, 2009; Tuck & Yang, 2014). Often this research was ‘damage-centered’, focused on describing Indigenous communities as broken or depleted (Tuck, 2009; Tuck & Yang, 2014).

In terms of this dissertation, the population of Indigenous actors that could be drawn from to be included in the sample is small – especially as this study focused on national level climate change policy. In any event, Indigenous actors in general are more difficult to access – partly due to their frequent choice not to participate, and partly because Indigenous actors tend to be overburdened with requests to participate in research (Tuck & Yang, 2014).

Though there are no organizations affiliated with Indigenous peoples or Indigenous communities in the interview or survey data, there are some interview respondents affiliated with other kinds of organizations who tried to represent Indigenous communities in their discussions; thus, there is some limited qualitative data on the views of Indigenous people on climate change issues and policy making in Canada, at least from the perspective of these actors. Moreover, Indigenous actors were also included in the list of targets in the surveys, meaning they can also be included in additional analyses that utilize outgoing ties from survey respondents.

In general however, if researchers desire to study climate change from an Indigenous perspective, then this should be the focus of the research, and it should be completed with the

consent and participation of Indigenous communities (Coburn, 2013; Tuck & Yang, 2014).

Future research could involve partnering with Indigenous communities in Canada to analyze the data in this study specific to Indigenous peoples in a framework that is helpful to those communities, and that respects each of these communities' protocols with respect to research.

References

- Abzianidze, N. (2020). Us vs. Them as Structural Equivalence: Analysing Nationalist Discourse Networks in the Georgian Print Media. *Politics and Governance*, 8(2), 243–256.
<https://doi.org/10.17645/pag.v8i2.2605>
- Adam, S., & Kriesi, H. (2007). The Network Approach. In *Theories of the Policy Process* (pp. 129–154). Boulder: Westview Press.
- Adler, E., & Haas, P. M. (1992). Conclusion: Epistemic Communities, World Order, and the Creation of a Reflective Research Program. *International Organization*, 46(1), 367–390.
- Ahn, T. K., Huckfeldt, R., & Ryan, J. B. (2010). Communication, Influence, and Informational Asymmetries among Voters. *Political Psychology*, 31(5), 763–787.
<https://doi.org/10.1111/j.1467-9221.2010.00783.x>
- Albright, E. A. (2011). Policy Change and Learning in Response to Extreme Flood Events in Hungary: An Advocacy Coalition Approach. *Policy Studies Journal*, 39(3), 485–511.
- Alvarez-Majmutov, A., & Chen, J. (2014). Analyzing the energy intensity and greenhouse gas emission of Canadian oil sands crude upgrading through process modeling and simulation. *Frontiers of Chemical Science and Engineering*, 8(2), 212–218.
<https://doi.org/10.1007/s11705-014-1424-z>
- Anderson, W. F. A., & Maclean, D. A. (2015). Public forest policy development in New Brunswick, Canada : multiple streams approach, advocacy coalition framework, and the role of science. *Ecology and Society*, 20(4), 1–20.
- Babbie, E. R. (2015). *The Practice of Social Research* (14th ed.). Boston: Cengage Learning.
- Barberá, P., & Steinert-Threlkeld, Z. C. (2020). How to Use Social Media Data for Political Science Research. In *The SAGE Handbook of Research Methods in Political Science and*

- International Relations* (pp. 404–423). 1 Oliver’s Yard, 55 City Road London EC1Y 1SP: SAGE Publications Ltd. <https://doi.org/10.4135/9781526486387.n26>
- Barberá, P., Wang, N., Bonneau, R., Jost, J. T., Nagler, J., Tucker, J., & González-Bailón, S. (2015). The critical periphery in the growth of social protests. *PLoS ONE*, *10*(11), 1–16. <https://doi.org/10.1371/journal.pone.0143611>
- Barker, A. J. (2015). ‘A Direct Act of Resurgence, a Direct Act of Sovereignty’: Reflections on Idle No More, Indigenous Activism, and Canadian Settler Colonialism.’ *Globalizations*, *12*(1), 43–65. <https://doi.org/10.1080/14747731.2014.971531>
- Barnett, L. (2021). Canada’s Approach to the Treaty-Making Process (Publication No. 2008-45-E). Ottawa.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173–1182.
- Baron, S., & Tindall, D. B. (1993). Network structure and delinquent attitudes within a juvenile gang. *Social Networks*, *15*(3), 255–273. [https://doi.org/10.1016/0378-8733\(93\)90008-9](https://doi.org/10.1016/0378-8733(93)90008-9)
- Benford, R. D. (2013). Master Frames. In D. A. Snow, D. Della Porta, B. Klandermans, & D. McAdam (Eds.), *The Blackwell Encyclopedia of Social and Political Movements*. Oxford: Blackwell.
- Benford, R. D., & Snow, D. A. (2000). Framing Processes and Social Movements: An Overview and Assessment. *Annual Review of Sociology*, *26*, 611–639.
- Bhattacharya, C. (2020). Gatekeeping the Plenary Floor: Discourse Network Analysis as a Novel Approach to Party Control. *Politics and Governance*, *8*(2), 229–242. <https://doi.org/10.17645/pag.v8i2.2611>

- Bienenstock, E. J., Bonacich, P., & Oliver, M. (1990). The effect of network density and homogeneity on attitude polarization. *Social Networks*, 12(2), 153–172.
[https://doi.org/10.1016/0378-8733\(90\)90003-R](https://doi.org/10.1016/0378-8733(90)90003-R)
- Bondonio, D. (1998). Predictors of accuracy in perceiving informal social networks. *Social Networks*, 20(4), 301–330. [https://doi.org/10.1016/S0378-8733\(98\)00007-0](https://doi.org/10.1016/S0378-8733(98)00007-0)
- Borgatti, S. P., Brass, D. J., & Halgin, D. S. (2014). Social Network Research: Confusions, Criticisms, and Controversies. In D. J. Brass (Ed.), *Contemporary Perspectives on Organizational Social Networks* (1st ed., Vol. 40). Bingley: Emerald Group Publishing Limited. [https://doi.org/10.1108/S0733-558X\(2014\)0000040001](https://doi.org/10.1108/S0733-558X(2014)0000040001)
- Borgatti, S. P., & Everett, M. G. (2000). Models of core / periphery structures. *Social Networks*, 375–395. [https://doi.org/10.1016/S0378-8733\(99\)00019-2](https://doi.org/10.1016/S0378-8733(99)00019-2)
- Borgatti, S. P., Everett, M. G., & Johnson, J. C. (2013). *Analyzing Social Networks*. SAGE.
- Borgatti, S. P., & Halgin, D. S. (2011). On Network Theory. *Organization Science*, 22(5), 1168–1181.
- Box-Steffensmeier, J. M., Christenson, D. P., & Morgan, J. W. (2018). Modeling Unobserved Heterogeneity in Social Networks with the Frailty Exponential Random Graph Model. *Political Analysis*, 26(1). <https://doi.org/10.1017/pan.2017.23>
- Boykoff, M. T. (2011). *Who Speaks for the Climate? Making Sense of Media Reporting on Climate Change*. Cambridge: Cambridge University Press.
- Boykoff, M. T., Aoyagi, M., Benham, A., Daly, M., Doi, K., Fernández-Reyes, R., ... Ytterstad, A. (2019). World Newspaper Coverage of Climate Change or Global Warming, 2004-2019 - August 2019. *Media and Climate Change Observatory Data Sets*, 235.
- Boykoff, M. T., & Boykoff, J. M. (2007). Climate change and journalistic norms: A case-study

- of US mass-media coverage. *Geoforum*, 38(6), 1190–1204.
<https://doi.org/10.1016/j.geoforum.2007.01.008>
- Boykoff, M. T., Katzung, J., & Nacu-Schmidt, A. (2019). *I am an environmentalist*. Boulder.
 Retrieved from <https://ciresblogs.colorado.edu/prometheus/2019/09/04/mecco-monthly-summary-i-am-an-environmentalist/>
- Broadbent, J. (2017). Comparative Climate Change Policy Networks. In J. N. Victor, A. H. Montgomery, & M. Lubell (Eds.), *The Oxford Handbook of Political Networks Edited* (pp. 1–27). New York: Oxford University Press.
<https://doi.org/10.1093/oxfordhb/9780190228217.013.38>
- Broadbent, J., Sonnett, J., Botetzagias, I., Carson, M., Carvalho, A., Chien, Y.-J., ... Zhengyi, S. (2016). Conflicting Climate Change Frames in a Global Field of Media Discourse. *Socius: Sociological Research for a Dynamic World*, 2, 237802311667066.
<https://doi.org/10.1177/2378023116670660>
- Broadbent, J., Yun, S.-J., Ku, D., Ikeda, K., Satoh, K., Pellissery, S., ... Jin, J. (2013). Asian Societies and Climate Change: The Variable Diffusion of Global Norms. *Globality Studies Journal*, July(32), 1–24.
- Brooks, S. (2012). *Canadian Democracy: An Introduction* (7th ed.). Toronto: Oxford University Press.
- Brunner, S. (2008). Understanding policy change: Multiple streams and emissions trading in Germany. *Global Environmental Change*, 18(3), 501–507.
<https://doi.org/10.1016/j.gloenvcha.2008.05.003>
- Bulkeley, H., & Betsill, M. (2005). Rethinking Sustainable Cities: Multilevel Governance and the “Urban” Politics of Climate Change. *Environmental Politics*, 14(1), 42–63.

<https://doi.org/10.1080/0964401042000310178>

Bulkeley, H., & Betsill, M. M. (2013). Revisiting the urban politics of climate change.

Environmental Politics, 22(1), 136–154. <https://doi.org/10.1080/09644016.2013.755797>

Burck, J., Marten, F., & Bals, C. (2013). *The Climate Change Performance Index: Results 2014*.

Burck, J., Marten, F., & Bals, C. (2014). *The Climate Change Performance Index: Results 2015*.

Retrieved from <https://germanwatch.org/en/9471>

Burck, J., Nascimento, L., Höhne, N., & Nascimento, L. (2021). *Climate Change Performance Index 2022: Results Monitoring Climate Mitigation Efforts of 60 Countries plus the EU - Covering 92% of the Global Greenhouse Gas Emissions*. Bonn.

Burck, J., Uhlich, T., Bals, C., Höhne, N., & Nascimento, L. (2021). *Climate Change Performance Index 2022: Background and Methodology*. Bonn.

Burt, R. S. (1987). Social Contagion and Innovation: Cohesion versus Structural Equivalence.

American Journal of Sociology, 92(6), 1287–1335. <https://doi.org/10.1086/228667>

Burt, R. S. (2001). Closure as social capital. In N. Lin, R. S. Burt, & K. Cook (Eds.), *Social Capital: Theory and Research* (pp. 31–55). New York: Aldine de Gruyter.

Calanni, J. C., Siddiki, S. N., Weible, C. M., & Leach, W. D. (2015). Explaining Coordination in Collaborative Partnerships and Clarifying the Scope of the Belief Homophily Hypothesis.

Journal of Public Administration Research and Theory, 25(3), 901–927.

<https://doi.org/10.1093/jopart/mut080>

Callison, C. (2014). *How Climate Change Comes to Matter*. Duke University Press.

<https://doi.org/10.1215/9780822376064>

Callison, C. (2017). Climate Change Communication and Indigenous Publics, *I*, 1–29.

<https://doi.org/10.1093/acrefore/9780190228620.013.411>

- Callison, C., & Tindall, D. B. (2017). *Climate Change Communication in Canada*. Oxford Research Encyclopedia of Climate Science.
<https://doi.org/10.1093/acrefore/9780190228620.013.477>
- Cameron, A. C., & Trivedi, P. K. (2013). *Regression Analysis of Count Data* (2nd ed.). New York: Cambridge University Press.
- Carroll, W. K. (2018). *Who Owns Canada's Fossil-Fuel Sector?: Mapping the Network of Ownership*. Vancouver: Canadian Centre for Policy Alternatives.
- Carroll, W. K., Graham, N., Lang, M. K., Yunker, Z., & McCartney, K. D. (2018). The Corporate Elite and the Architecture of Climate Change Denial: A Network Analysis of Carbon Capital's Reach into Civil Society. *Canadian Review of Sociology*, 55(3), 425–450.
<https://doi.org/10.1111/cars.12211>
- Carroll, W. K., Graham, N., & Shakespear, M. (2020). Foundations, ENGOs, Clean-Growth Networks and the Integral State. *Canadian Journal of Sociology*, 45(2), 109–142.
<https://doi.org/10.29173/cjs29638>
- Carter, A. V. (2020). *Fossilized: Environmental Policy in Canada's Petro-Provinces*. Vancouver: UBC Press.
- Carter, A. V., & Zalik, A. (2016). Fossil Capitalism and the Rentier State: Towards a Political Ecology of Alberta's Oil Economy. In L. E. Adkin (Ed.), *First World Petro-Politics: The Political Ecology and Governance of Alberta* (pp. 51–77). Toronto: University of Toronto Press.
- Casciaro, T., Carley, K. M., & Krackhardt, D. (1999). Positive Affectivity and Accuracy in Social Network Perception. *Motivation and Emotion*, 23, 285–306.
- Casciaro, Tiziana, & Piskorski, M. J. (2005). Power Imbalance, Mutual Dependence, and

- Constraint Absorption: A Closer Look at Resource Dependence Theory. *Administrative Science Quarterly*, 50(2), 167–199. <https://doi.org/10.2189/asqu.2005.50.2.167>
- Chen, T. H. Y., Salloum, A., Gronow, A., Ylä-Anttila, T., & Kivelä, M. (2021). Polarization of climate politics results from partisan sorting: Evidence from Finnish Twittersphere. *Global Environmental Change*, 71, 102348. <https://doi.org/10.1016/j.gloenvcha.2021.102348>
- Chilvers, J., & Evans, J. (2009). Understanding networks at the science–policy interface. *Geoforum*, 40, 355–362.
- Choudry, A., & Kapoor, D. (2013). Introduction. In A. Choudry & D. Kapoor (Eds.), *NGOization: Complicity, contradictions and prospects*. (pp. 1–23). New York: Zed Books.
- Coburn, E. (2013). Indigenous Research as Resistance. *Socialist Studies*, 9(1), 52–63.
- Coleman, J. S. (1994). *Foundations of Social Theory*. Cambridge: Harvard University Press.
- Collins, K., & Ison, R. (2009). Jumping off Arnstein’s ladder: social learning as a new policy paradigm for climate change adaptation. *Environmental Policy and Governance*, 19(6), 358–373. <https://doi.org/10.1002/eet.523>
- Cormier, J., & Tindall, D. B. (2005). Wood Frames: Framing the Forests in British Columbia. *Sociological Focus*, 383(1), 1–24. <https://doi.org/10.1080/00380237.2005.10571254>
- Corrigall-Brown, C. (2016). What Gets Covered? An Examination of Media Coverage of the Environmental Movement in Canada. *Canadian Review of Sociology/Revue Canadienne de Sociologie*, 53(1), 72–93. <https://doi.org/10.1111/cars.12092>
- Corrigall-Brown, C., & Wilkes, R. (2012). Picturing Protest : The Visual Framing of Collective Action by First Nations in Canada. *American Behavioral Scientist*, 56(2), 223–243. <https://doi.org/10.1177/0002764211419357>
- Costenbader, E., & Valente, T. W. (2003). The stability of centrality measures when networks

- are sampled. *Social Networks*, 25(4), 283–307. [https://doi.org/10.1016/S0378-8733\(03\)00012-1](https://doi.org/10.1016/S0378-8733(03)00012-1)
- Coulthard, G. S. (2014). *Red Skin, White Masks: Rejecting the Colonial Politics of Recognition*. Minneapolis: University of Minnesota Press.
- Cranmer, S. J., & Desmarais, B. A. (2011). Inferential Network Analysis with Exponential Random Graph Models. *Political Analysis*, 19(1), 66–86.
- Crawley, M. (2021). Ontario veering off track from its climate change targets, internal forecasts reveal. *CBC News*. Retrieved from <https://www.ontario.ca/page/made-in-ontario-environment-plan>
- Dalton, R. J., Recchia, S., & Rohrschneider, R. (2003). The Environmental Movement and the Modes of Political Action. *Comparative Political Studies*, 36(7), 743–771. <https://doi.org/10.1177/0010414003255108>
- Davidson, D. J., & Gismondi, M. (2011). *Challenging Legitimacy and the Precipice of Energy Calamity*. New York: Springer. <https://doi.org/10.1007/978-1-4614-0287-9>
- de la Haye, K., Embree, J., Punkay, M., Espelage, D. L., Tucker, J. S., & Green, H. D. (2017). Analytic strategies for longitudinal networks with missing data. *Social Networks*, 50, 17–25. <https://doi.org/10.1016/j.socnet.2017.02.001>
- Doreian, P., & Conti, N. (2012). Social context, spatial structure and social network structure. *Social Networks*, 34(1), 32–46. <https://doi.org/10.1016/j.socnet.2010.09.002>
- Downs, A. (1972). Up and Down with Ecology - The “Issue-Attention Cycle.” *The Public Interest*, 28, 38–50.
- Doyle, A., Elliot, B., & Tindall, D. B. (1997). Framing the forests: Corporations, the B.C. Forest Alliance, and the media. In W. K. Carroll (Ed.), *Organizing Dissent: Contemporary Social*

- Movements in Theory and Practice* (2nd ed., pp. 240–257). Toronto: Garamond Press.
- Dunlop, C. A. (2013). Epistemic Communities. In E. Araral Jr., S. Fritzen, M. Howlett, M. Ramesh, & X. Wu (Eds.), *Routledge Handbook of Public Policy* (pp. 229–243). New York.
- Duxbury, S. W. (2018). Diagnosing Multicollinearity in Exponential Random Graph Models. *Sociological Methods & Research*, 004912411878254. <https://doi.org/10.1177/0049124118782543>
- Earl, J., Hunt, J., Garrett, R. K., & Dal, A. (2015). New Technologies and Social Movements. In D. Della Porta & M. Diani (Eds.), *The Oxford Handbook of Social Movements* (pp. 1–14). Croydon: Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199678402.013.20>
- Ensor, J., & Harvey, B. (2015). Social learning and climate change adaptation: evidence for international development practice. *WIREs Climate Change*, 6(5), 509–522. <https://doi.org/10.1002/wcc.348>
- Erickson, B. H. (1982). Networks, Ideologies, and Belief Systems. In N. Lin & P. V. Marsden (Eds.), *Social Structure and Network Analysis* (pp. 159–172). Sage Publications Ltd.
- Erutku, C., & Hildebrand, V. (2018). Carbon tax at the pump in British Columbia and Quebec. *Canadian Public Policy*, 44(2), 126–133. <https://doi.org/10.3138/cpp.2017-027>
- Festinger, L. (1950). Informal social communication. *Psychological Review*, 57(5), 271–282. <https://doi.org/10.1037/h0056932>
- Fischer, M., Ingold, K., Sciarini, P., & Varone, F. (2012). Impacts of Market Liberalization on Regulatory Network: A Longitudinal Analysis of the Swiss Telecommunications Sector. *Policy Studies Journal*, 40(3), 435–457. <https://doi.org/10.1111/j.1541-0072.2012.00460.x>
- Fischer, M., & Sciarini, P. (2015). Unpacking reputational power: Intended and unintended

- determinants of the assessment of actors' power. *Social Networks*, 42, 60–71.
<https://doi.org/10.1016/j.socnet.2015.02.008>
- Fischer, M., & Sciarini, P. (2016). Drivers of Collaboration in Political Decision Making: A Cross-Sector Perspective. *The Journal of Politics*, 78(1), 63–74.
<https://doi.org/10.1086/683061>
- Fisher, D. R., Waggle, J., & Jasny, L. (2015). Not a Snowball's Chance for Science. *Contexts*, 14(4), 44–49.
- Fisher, D. R., Waggle, J., & Leifeld, P. (2013). Where Does Political Polarization Come From? Locating Polarization Within the U. S. Climate Change Debate. *American Behavioral Scientist*, 57(1), 70–92. <https://doi.org/10.1177/0002764212463360>
- Fogarty, E. A. (2011). Nothing Succeeds Like Access? NGO Strategies Towards Multilateral Institutions. *Journal of Civil Society*, 7(2), 207–227.
<https://doi.org/10.1080/17448689.2011.573670>
- Francesch-Huidobro, M. (2012). Institutional deficit and lack of legitimacy: the challenges of climate change governance in Hong Kong. *Environmental Politics*, 21(5), 791–810.
<https://doi.org/10.1080/09644016.2012.686221>
- Freeman, L. C. (1978). Centrality in Social Networks. *Social Networks*, 1(1968), 215–239.
[https://doi.org/10.1016/0378-8733\(78\)90021-7](https://doi.org/10.1016/0378-8733(78)90021-7)
- Freeman, L. C. (2004). *The development of social network analysis. Document Design* (Vol. 27).
<https://doi.org/10.1016/j.socnet.2005.01.010>
- Freeman, L. C., Romney, A. K., & Freeman, S. C. (1987). Cognitive Structure and Informant Accuracy. *American Anthropologist*, 89(2), 310–325.
<https://doi.org/10.1525/aa.1987.89.2.02a00020>

- Friedkin, N. E. (1999). Choice Shift and Group Polarization. *American Sociological Review*, 64(6), 856–875.
- Friedkin, N. E. (2001). Norm formation in social influence networks. *Social Networks*, 23(3), 167–189. [https://doi.org/10.1016/S0378-8733\(01\)00036-3](https://doi.org/10.1016/S0378-8733(01)00036-3)
- Friedkin, N. E. (2009). Jaccard-Spline index of structural proximity in contact networks. *Social Networks*, 31(1), 76–84. <https://doi.org/10.1016/j.socnet.2008.10.002>
- Friedkin, N. E. (2015). Models of Influence in Networks. In J. Wright (Ed.), *International Encyclopedia of Social & Behavioral Sciences* (2nd ed., Vol. 15, pp. 659–666). Elsevier. <https://doi.org/10.1016/B978-0-08-097086-8.43111-9>
- Friedkin, N. E., & Johnsen, E. (1999). Social Influence Networks and Opinion Change. *Advances in Group Processes*, 16, 1–29.
- Friedkin, N. E., & Johnsen, E. C. (2011). *Social Influence Network Theory: A Sociological Examination of Small Group Dynamics*. Cambridge: Cambridge University Press. <https://doi.org/10.1017/CBO9780511976735>
- Gamson, W. A. (2007). Bystanders, Public Opinion, and the Media. In D. A. Snow, S. A. Soule, & H. Kriesi (Eds.), *The Blackwell Companion to Social Movements* (pp. 242–261). Maldon: Blackwell.
- Gartrell, C. D. (1987). Network approaches to social evaluation. *Annual Review of Sociology*, 13, 49–66.
- Ghini, S., & Steiner, B. (2020). The Political Debate on Climate Change in Italy: A Discourse Network Analysis. *Politics and Governance*, 8(2), 215–228. <https://doi.org/10.17645/pag.v8i2.2577>
- Goldtooth, D., Saldamando, A., & Gracey, K. (2021). *Indigenous Resistance Against Carbon*.

Washington.

Government of Ontario. (2007). *Go Green: Ontario's Action Plan on Climate Change*. Retrieved from [http://www.climateontario.ca/doc/workshop/2011LakeSimcoe/Ontarios Go Green Action Plan on Climate Change.pdf](http://www.climateontario.ca/doc/workshop/2011LakeSimcoe/Ontarios%20Go%20Green%20Action%20Plan%20on%20Climate%20Change.pdf)

Graham, N. (2019). Canadian Fossil Capitalism, Corporate Strategy, and Post-Carbon Futures. *Canadian Review of Sociology/Revue Canadienne de Sociologie*, 56(2), 224–250. <https://doi.org/10.1111/cars.12244>

Granatstein, J. L., & Bothwell, R. (1990). *Pirouette: Pierre Trudeau and Canadian Foreign Policy*. Toronto: University of Toronto Press.

Grant, W. (2004). Pressure politics: The changing world of pressure groups. *Parliamentary Affairs*, 57(2), 408–419. <https://doi.org/10.1093/pa/gsh033>

Gremmen, M. C., Dijkstra, J. K., Steglich, C., & Veenstra, R. (2017). First selection, then influence: Developmental differences in friendship dynamics regarding academic achievement. *Developmental Psychology*, 53(7), 1356–1370. <https://doi.org/10.1037/dev0000314>

Gronow, A., Wagner, P., & Ylä-Anttila, T. (2020). Explaining collaboration in consensual and conflictual governance networks. *Public Administration*, 98(3), 730–745. <https://doi.org/10.1111/padm.12641>

Gronow, A., & Ylä-Anttila, T. (2016). Cooptation of ENGOs or Treadmill of Production? Advocacy Coalitions and Climate Change Policy in Finland. *Policy Studies Journal*, 47(4), 860–881.

Gronow, A., Ylä-Anttila, T., Carson, M., & Edling, C. (2019). Divergent neighbors: corporatism and climate policy networks in Finland and Sweden. *Environmental Politics*, 28(6), 1061–

1083. <https://doi.org/10.1080/09644016.2019.1625149>
- Haines, A., & Ebi, K. (2019). The Imperative for Climate Action to Protect Health. *New England Journal of Medicine*, 380(3), 263–273. <https://doi.org/10.1056/NEJMr1807873>
- Halidullin, O. (2018). On climate change. *Journal of Aquaculture & Marine Biology*, 7(5), 285. <https://doi.org/10.15406/jamb.2018.07.00221>
- Hall, P. A. (1993). Policy Paradigms , Social Learning , and the State: The Case of Economic Policymaking in Britain. *Comparative Politics*, 25(3), 275–296.
- Handcock, M. S., & Gile, K. J. (2010). Modeling social networks from sampled data. *The Annals of Applied Statistics*, 4(3), 5.
- Handcock, M. S., Hunter, D. R., Butts, C. T., Goodreau, S. M., Krivitsky, P. N., & Morris, M. (2019). *ergm: Fit, Simulate and Diagnose Exponential-Family Models for Networks*. The Statnet Project (<https://statnet.org>). R package version 3.10.4, <https://CRAN.R-project.org/package=ergm>.
- Hanneman, R. A., & Riddle, M. (2005). *Introduction to social network methods*. Riverside: University of California, Riverside. (Published in digital form at <http://faculty.ucr.edu/~hanneman/>).
- Harrison, K. (2007). The Road not Taken: Climate Change Policy in Canada and the United States. *Global Environmental Politics*, 7(4), 92–117.
- Harrison, K. (2012). A Tale of Two Taxes: The Fate of Environmental Tax Reform in Canada. *Review of Policy Research*, 29(3), 383–407.
- Hart, M. (2020). Harper’s foreign policy: Prudence on the climate front. Retrieved March 18, 2022, from <https://policyoptions.irpp.org/fr/magazines/harpers-foreign-policy/stephen-harpers-foreign-policy-prudence-on-the-climate-front/>

- Heaney, M. T. (2014). Multiplex networks and interest group influence reputation: An exponential random graph model. *Social Networks*, 36(1), 66–81.
<https://doi.org/10.1016/j.socnet.2012.11.003>
- Heaney, M. T., & Lorenz, G. M. (2013). Coalition portfolios and interest group influence over the policy process. *Interest Groups & Advocacy*, 2(3), 251–277.
<https://doi.org/10.1057/iga.2013.7>
- Henry, A. D. (2011). Ideology, Power, and the Structure of Policy Networks. *Policy Studies Journal*, 39(3), 361–383.
- Henry, A. D., Ingold, K., Nohrstedt, D., & Weible, C. M. (2014). Policy Change in Comparative Contexts: Applying the Advocacy Coalition Framework Outside of Western Europe and North America. *Journal of Comparative Policy Analysis: Research and Practice*, 16(4), 299–312. <https://doi.org/10.1080/13876988.2014.941200>
- Henry, A. D., Lubell, M., & McCoy, M. (2011). Belief systems and social capital as drivers of policy network structure: The case of California regional planning. *Journal of Public Administration Research and Theory*, 21(3), 419–444.
<https://doi.org/10.1093/jopart/muq042>
- Hickey, G. M., Forest, P., Sandall, J. L., Lalor, B. M., & Keenan, R. J. (2013). Managing the environmental science-policy nexus in government: Perspectives from public servants in Canada and Australia. *Science and Public Policy*, 40(4), 529–543.
<https://doi.org/10.1093/scipol/sct004>
- Hirsch, T. (2020). The oil sands : Sorting out fact from fiction. *Policy Options*, 11, 1–5.
- Hoberg, G. (2013). The Battle Over Oil Sands Access to Tidewater: A Political Risk Analysis of Pipeline Alternatives. *Canadian Public Policy*, 39(3), 371–391.

<https://doi.org/10.3138/CPP.39.3.371>

- Houle, D., Lachapelle, E., & Purdon, M. (2015). Comparative Politics of Sub-Federal Cap-and-Trade: Implementing the Western Climate Initiative. *Global Environmental Politics*, 15(3), 49–73. Retrieved from <https://www.muse.jhu.edu/article/587546>
- Howe, A. C., Stoddart, M. C. J., & Tindall, D. B. (2020). Media Coverage and Perceived Policy Influence of Environmental Actors: Good Strategy or Pyrrhic Victory? *Politics and Governance*, 8(2), 298. <https://doi.org/10.17645/pag.v8i2.2595>
- Howe, A. C., Tindall, D. B., & Stoddart, M. C. J. (2021). Drivers of tie formation in the Canadian climate change policy network: Belief homophily and social structural processes. *Social Networks*. <https://doi.org/10.1016/j.socnet.2021.06.004>
- Howe, A. C., & Wilkes, R. (2018). Activist Public Relations: Moving from frames as objects to framing as a dynamic process. In A. Adi (Ed.), *Protest Public Relations* (pp. 248–261). Routledge.
- Huang, F., Zhang, M., & Li, Y. (2019). A Comparison Study of Tie Non-response Treatments in Social Networks Analysis. *Frontiers in Psychology*, 9. <https://doi.org/10.3389/fpsyg.2018.02766>
- Hubert, L., & Schultz, J. (1976). Quadratic Assignment as a General Data Analysis Strategy. *British Journal of Mathematical and Statistical Psychology*, 29(2), 190–241. <https://doi.org/10.1111/j.2044-8317.1976.tb00714.x>
- Huckfeldt, R. (2001). The Social Communication of Political Expertise. *American Journal of Political Science*, 45(2), 425. <https://doi.org/10.2307/2669350>
- Huckfeldt, R., Pietryka, M. T., & Reilly, J. (2014). Noise, bias, and expertise in political communication networks. *Social Networks*, 36, 110–121.

<https://doi.org/10.1016/j.socnet.2013.02.003>

Huisman, M. (2014). Imputation of Missing Network Data: Some Simple Procedures.

Encyclopedia of Social Network Analysis and Mining, 707–715.

https://doi.org/10.1007/978-1-4614-6170-8_394

Huisman, M., & Krause, R. W. (2017). Imputation of Missing Network Data. In *Encyclopedia of Social Network Analysis and Mining* (pp. 1–10). New York, NY: Springer New York.

https://doi.org/10.1007/978-1-4614-7163-9_394-1

Huisman, M., & Steglich, C. (2008). Treatment of non-response in longitudinal network studies.

Social Networks, 30(4), 297–308. <https://doi.org/10.1016/j.socnet.2008.04.004>

Hunter, D. R. (2007). Curved exponential family models for social networks. *Social Networks*,

29, 216–230. <https://doi.org/10.1016/j.socnet.2006.08.005>

Hunter, D. R., Handcock, M. S., Butts, C. T., Goodreau, S. M., & Morris, M. (2008). **ergm**: A

Package to Fit, Simulate and Diagnose Exponential-Family Models for Networks. *Journal of Statistical Software*, 24(3), 1–29. <https://doi.org/10.18637/jss.v024.i03>

Hutchins, B., & Lester, L. (2015). Theorizing the enactment of mediatized environmental conflict. *International Communication Gazette*, 77(4), 337–358.

<https://doi.org/10.1177/1748048514568765>

Ingold, K., & Fischer, M. (2014). Drivers of collaboration to mitigate climate change: An

illustration of Swiss climate policy over 15 years. *Global Environmental Change*, 24(1),

88–98. <https://doi.org/10.1016/j.gloenvcha.2013.11.021>

Ingold, K., Fischer, M., & Cairney, P. (2017). Drivers for Policy Agreement in Nascent

Subsystems : An Application of the Advocacy Coalition Framework to Fracking Policy in Switzerland and the UK. *Policy Studies Journal*, 45(3), 442–463.

<https://doi.org/10.1111/psj.12173>

- Ingold, K., & Leifeld, P. (2016). Structural and Institutional Determinants of Influence Reputation: A Comparison of Collaborative and Adversarial Policy Networks in Decision Making and Implementation. *Journal of Public Administration Research and Theory*, 1–18. <https://doi.org/10.1093/jopart/muu043>
- IPCC. (2021). Summary for Policymakers. In V. Masson-Delmotte, P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, ... B. Zhou (Eds.), *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (pp. 1–31).
- Jaccard, M. (2016). Want an effective climate policy? Heed the evidence. *Policy Options*, 2, 1–7.
- Jang, S. M., & Pasek, J. (2015). Assessing the Carrying Capacity of Twitter and Online News. *Mass Communication and Society*, 18(5), 577–598. <https://doi.org/10.1080/15205436.2015.1035397>
- Jasny, L., Waggle, J., & Fisher, D. R. (2015). An empirical examination of echo chambers in US climate policy networks. *Nature Climate Change*, 5, 782–1020. <https://doi.org/10.1038/NCLIMATE2666>
- Jenkins-Smith, H. C., Nohrstedt, D., Weible, C. M., & Sabatier, P. A. (2014). The Advocacy Coalition Framework: Foundations, Evolution, and Ongoing Research. In P. A. Sabatier & C. M. Weible (Eds.), *Theories of the Policy Process* (3rd ed., pp. 183–224). New York: Westview Press.
- Jenkins-Smith, H. C., Silva, C. L., Gupta, K., & Ripberger, J. T. (2014). Belief System Continuity and Change in Policy Advocacy Coalitions: Using Cultural Theory to Specify Belief Systems, Coalitions, and Sources of Change. *Policy Studies Journal*, 42(4), 484–508.

- Johnson, J. C., & Orbach, M. K. (2002). Perceiving the political landscape: ego biases in cognitive political networks. *Social Networks*, 24(3), 291–310.
[https://doi.org/10.1016/S0378-8733\(02\)00006-0](https://doi.org/10.1016/S0378-8733(02)00006-0)
- Jörgens, H., Kolleck, N., & Saerbeck, B. (2016). Exploring the hidden influence of international treaty secretariats: using social network analysis to analyse the Twitter debate on the ‘Lima Work Programme on Gender.’ *Journal of European Public Policy*, 23(7), 979–998.
<https://doi.org/10.1080/13501763.2016.1162836>
- Kammerer, M., & Ingold, K. (2021). Actors and issues in climate change policy: The maturation of a policy discourse in the national and international context. *Social Networks*, (xxxx).
<https://doi.org/10.1016/j.socnet.2021.08.005>
- Kay, A. (2006). *The Dynamics of Public Policy: Theory and Evidence*. Cheltenham: Edward Elgar Publishing Limited.
- Kettle, N. P., Trainor, S. F., & Loring, P. A. (2017). Conceptualizing the science-practice interface: Lessons from a collaborative network on the front-line of climate change. *Frontiers in Environmental Science*, 5(JUN), 1–9. <https://doi.org/10.3389/fenvs.2017.00033>
- Kim, K., & Altmann, J. (2017). Effect of homophily on network formation. *Communications in Nonlinear Science and Numerical Simulation*, 44, 482–494.
<https://doi.org/10.1016/j.cnsns.2016.08.011>
- Kitts, J. A., & Quintane, E. (2020). Rethinking Social Networks in the Era of Computational Social Science. In R. Light & J. Moody (Eds.), *The Oxford Handbook of Social Networks* (pp. 71–97). New York: Oxford University Press.
- Klinsky, S. (2013). Bottom-up policy lessons emerging from the Western Climate Initiative’s development challenges. *Climate Policy*, 13(2), 143–169.

<https://doi.org/10.1080/14693062.2012.712457>

Klüver, H. (2009). Measuring Interest Group Influence Using Quantitative Text Analysis.

European Union Politics, 10(4), 535–549. <https://doi.org/10.1177/1465116509346782>

Knoke, D. (1990). *Political Networks : The Structural Perspective*. New York: Cambridge University Press.

Knoke, D. (2011). Policy Networks. In *The SAGE Handbook of Social Network Analysis* (pp. 210–222). London: SAGE Publications Ltd. <https://doi.org/10.4135/9781446294413.n15>

Knoke, D., Pappi, F. U., Broadbent, J., & Tsujinaka, Y. (1996). *Comparing Policy Networks: Labor Politics in the U.S., Germany, and Japan*. New York: Cambridge University Press.

Knoke, D., & Yang, S. (2008). *Social Network Analysis* (Second). Thousand Oaks: Sage Publications, Inc.

Koebele, E. A. (2019). Integrating collaborative governance theory with the Advocacy Coalition Framework. *Journal of Public Policy*, 39(1), 35–64.

<https://doi.org/10.1017/S0143814X18000041>

Koskinen, J. H., Robins, G. L., Wang, P., & Pattison, P. E. (2013). Bayesian analysis for partially observed network data, missing ties, attributes and actors. *Social Networks*, 35(4), 514–527. <https://doi.org/10.1016/j.socnet.2013.07.003>

Kossinets, G. (2006). Effects of missing data in social networks. *Social Networks*, 28(3), 247–268. <https://doi.org/10.1016/j.socnet.2005.07.002>

Kossinets, G., & Watts, D. J. (2009). Origins of Homophily in an Evolving Social Network. *American Journal of Sociology*, 115(2), 405–450. <https://doi.org/10.1086/599247>

Krackardt, D. (1987). QAP partialling as a test of spuriousness. *Social Networks*, 9(2), 171–186. [https://doi.org/10.1016/0378-8733\(87\)90012-8](https://doi.org/10.1016/0378-8733(87)90012-8)

- Krause, R. W., & Caimo, A. (2019). Missing Data Augmentation for Bayesian Exponential Random Multi-Graph Models. In S. Cornelius, C. Granell Martorell, J. Gómez-Gardeñes, & B. Gonçalves (Eds.), *Complex Networks X.: Proceedings of the 10th Conference on Complex Networks CompleNet 2019* (pp. 63–72). Springer Proceedings in Complexity. https://doi.org/10.1007/978-3-030-14459-3_5
- Krause, R. W., Huisman, M., Steglich, C., & Snijders, T. (2020). Missing data in cross-sectional networks – An extensive comparison of missing data treatment methods. *Social Networks*, 62, 99–112. <https://doi.org/10.1016/j.socnet.2020.02.004>
- Krause, R. W., Huisman, M., Steglich, C., & Snijders, T. A. B. (2018). Missing Network Data A Comparison of Different Imputation Methods. In *2018 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM)* (pp. 159–163). IEEE. <https://doi.org/10.1109/ASONAM.2018.8508716>
- Krause, R. W., & Snijders, T. A. B. (2018). Multiple Imputation for Longitudinal Network Data. *Statistica Applicata - Italian Journal of Applied Statistics*, 30(1), 243–270.
- Krivitsky, P. N., & Morris, M. (2017). Inference for social network models from egocentrically sampled data, with application to understanding persistent racial disparities in HIV prevalence in the US. *The Annals of Applied Statistics*, 11(1). <https://doi.org/10.1214/16-AOAS1010>
- Kröger, L. (2005). Development of The Finnish Agri-Environmental Policy as a Learning Process. *European Environment*, 15, 13–26.
- Kukkonen, A., Stoddart, M. C. J., & Ylä-Anttila, T. (2021). Actors and justifications in media debates on Arctic climate change in Finland and Canada: A network approach. *Acta Sociologica*, 64(1), 103–117. <https://doi.org/10.1177/0001699319890902>

- Kukkonen, A., & Ylä-Anttila, T. (2020). The Science–Policy Interface as a Discourse Network: Finland’s Climate Change Policy 2002–2015. *Politics and Governance*, 8(2), 200–214.
<https://doi.org/10.17645/pag.v8i2.2603>
- Kukkonen, A., Ylä-Anttila, T., & Broadbent, J. (2017). Advocacy coalitions, beliefs and climate change policy in the United States. *Public Administration*, 95(3), 713–729.
<https://doi.org/10.1111/padm.12321>
- Kukkonen, A., Ylä-Anttila, T., Swarnakar, P., Broadbent, J., Lahsen, M., & Stoddart, M. C. J. (2018). International organizations, advocacy coalitions, and domestication of global norms: Debates on climate change in Canada, the US, Brazil, and India. *Environmental Science and Policy*, 81(October 2017), 54–62. <https://doi.org/10.1016/j.envsci.2017.12.008>
- Lacey, J., Howden, M., Cvitanovic, C., & Colvin, R. M. (2018). Understanding and managing trust at the climate science–policy interface. *Nature Climate Change*, 8(1), 22–28.
<https://doi.org/10.1038/s41558-017-0010-z>
- Lachapelle, E., & Kiss, S. (2019). Opposition to carbon pricing and right-wing populism: Ontario’s 2018 general election. *Environmental Politics*, 28(5), 970–976.
<https://doi.org/10.1080/09644016.2019.1608659>
- Lameman, C. (2014). Kihci Pikiskwewin - Speaking the truth. In T. Black, S. D’arcy, T. Weiss, & J. K. Russell (Eds.), *A Line in the Tar Sand: Struggles for Environmental Justice* (pp. 118–126). Toronto: PM Press.
- Lang, S. (2013). The NGOization of Civil Society. In *NGOs, Civil Society, and the Public Sphere* (pp. 60–96). Cambridge: Cambridge University Press.
<https://doi.org/10.1017/cbo9781139177146.004>
- Lauber, T. B., & Brown, T. L. (2006). Learning by Doing : Policy Learning in Community-

- Based Deer Management. *Society and Natural Resources*, 19(5), 411–428.
<https://doi.org/10.1080/08941920600561066>
- Laumann, E. O., & Knoke, D. (1987). *The Organizational State: Social Choice in National Policy Domains*. Madison: University of Wisconsin Press.
- Leach, W. D., & Sabatier, P. A. (2005). To trust an adversary: Integrating rational and psychological models of collaborative policymaking. *American Political Science Review*, 99(4), 491–503. <https://doi.org/10.1017/S000305540505183X>
- Leifeld, P. (2013). Reconceptualizing Major Policy Change in the Advocacy Coalition Framework : A Discourse Network Analysis of German Pension Politics. *Policy Studies Journal*, 41(1), 169–198.
- Leifeld, P. (2015). Discourse Network Analyzer (DNA). A Java-Based Software for Qualitative Data Analysis with Network Export. (accessed on October 16, 2019). Retrieved from <https://github.com/leifeld/dna> (October 16, 2019)
- Leifeld, P. (2017). Discourse Network Analysis: Policy Debates as Dynamic Networks. In *The Oxford Handbook of Political Networks* (pp. 301–326).
<https://doi.org/10.1093/oxfordhb/9780190228217.013.25>
- Leifeld, P. (2020). Policy Debates and Discourse Network Analysis: A Research Agenda. *Politics and Governance*, 8(2), 180. <https://doi.org/10.17645/pag.v8i2.3249>
- Leifeld, P., & Haunss, S. (2012). Political discourse networks and the conflict over software patents in Europe. *European Journal of Political Research*, 51, 382–409.
<https://doi.org/10.1111/j.1475-6765.2011.02003.x>
- Leifeld, P., & Schneider, V. (2012). Information Exchange in Policy Networks. *American Journal of Political Science*, 56(3), 731–744. <https://doi.org/10.1111/j.1540->

5907.2011.00580.x

Lertzman, K., Rayner, J., & Wilson, J. (1996). Learning and Change in the British Columbia

Forest Policy Sector : A Consideration of Sabatier's Advocacy Coalition Framework.

Canadian Journal of Political Science, 29(1), 111–133.

Lester, L., & Hutchins, B. (2012). The power of the unseen: environmental conflict, the media and invisibility. *Media, Culture & Society*, 34(7), 847–863.

<https://doi.org/10.1177/0163443712452772>

Lijphart, A. (Ed.). (2012). *Patterns of Democracy: Government Forms and Performance in*

Thirty-Six Countries (2nd ed.). New Haven: Yale University Press.

Lomi, A., Snijders, T. A. B., Steglich, C. E. G., & Torló, V. J. (2011). Why are some more peer than others? Evidence from a longitudinal study of social networks and individual academic performance. *Social Science Research*, 40(6), 1506–1520.

<https://doi.org/10.1016/j.ssresearch.2011.06.010>

Lubell, M., Scholz, J., Berardo, R., & Robins, G. (2012). Testing Policy Theory with Statistical Models of Networks. *Policy Studies Journal*, 40(3), 351–374.

Lusher, D., Koskinen, J., & Robins, G. (Eds.). (2013). *Exponential Random Graph Models for Social Networks. Theory, Methods and Applications*. New York: Cambridge University Press.

Lusher, D., & Robins, G. (2013a). Formation of Social Network Structure. In D. Lusher, J. Koskinen, & G. Robins (Eds.), *Exponential Random Graph Models for Social Networks: Theory, Methods, and Applications* (pp. 16–28). New York: Cambridge University Press.

Retrieved from

[/chapter.jsf?bid=CBO9780511894701A012&cid=CBO9780511894701A012](#)

- Lusher, D., & Robins, G. (2013b). Personal Attitudes, Perceived Attitudes, and Social Structures: A Social Selection Model. In D. Lusher, J. Koskinen, & G. Robins (Eds.), *Exponential Random Graph Models for Social Networks: Theory, Methods, and Applications* (pp. 189–201). New York: Cambridge University Press.
- MacNeil, R. (2019). *Thirty Years of Failure: Understanding Canadian Climate Policy*. Winnipeg; Halifax: Fernwood Publishing.
- MacNeil, R., & Paterson, M. (2018). Trudeau's Canada and the challenge of decarbonisation. *Environmental Politics*, 27(2), 379–384. <https://doi.org/10.1080/09644016.2018.1414747>
- Malinick, T. E., Tindall, D. B., & Diani, M. (2013). Network centrality and social movement media coverage: A two-mode network analytic approach. *Social Networks*, 35(2), 148–158. <https://doi.org/10.1016/j.socnet.2011.10.005>
- Marsden, P. V. (1990). Network Data and Measurement. *Annual Review of Sociology*, 16(1), 435–463. <https://doi.org/10.1146/annurev.so.16.080190.002251>
- Marsden, P. V., & Friedkin, N. E. (1993). Network Studies of Social Influence. *Sociological Methods & Research*, 22(1), 127–151.
- Masson-Delmotte, V., Zhai, P., Pörtner, H.-O., Roberts, D., Skea, J., Shukla, P. R., ... Waterfield, T. (2018). IPCC 2018: Global Warming of 1.5°C. An IPCC Special Report on the Impacts of Global Warming of 1.5°C Above pre-Industrial Levels and Related Global Greenhouse Gas Emission Pathways, in the Context of Strengthening the Global Response to the Threat of Climate Change, Sustainable Development, and Efforts to Eradicate Poverty.
- Matti, S. (2013). The Defining Elements of Advocacy Coalitions: Coordination and Coalition Structures. *Review of Policy Research*, 30(2), 240–257.

- Matti, S., & Sandström, A. (2011). The Rationale Determining Advocacy Coalitions: Examining Coordination Networks and Corresponding Beliefs. *Policy Studies Journal*, 39(3), 385–410.
- McAdam, D. (1982). *Political process and the development of black insurgency, 1930-1970*. University of Chicago Press.
- McAdam, D. (2017). Social Movement Theory and the Prospects for Climate Change Activism in the United States. *Annual Review of Political Science*, 20, 189–208.
<https://doi.org/10.1146/annurev-polisci-052615-025801>
- McAdam, D., McCarthy, J. D., & Zald, M. N. (2012). Introduction: Opportunities, mobilizing structures, and framing processes – toward a synthetic, comparative perspective on social movements. In D. McAdam, J. D. McCarthy, & M. N. Zald (Eds.), *Comparative Perspectives on Social Movements* (pp. 1–20). New York: Cambridge University Press.
<https://doi.org/10.1017/cbo9780511803987.002>
- McCarthy, J. D., & Zald, M. N. (1977). Resource Mobilization and Social Movements: A Partial Theory. *American Journal of Sociology*, 82(6), 1212–1241. <https://doi.org/10.1086/226464>
- McCombs, M., & Zhu, J.-H. (1995). Capacity, Diversity, and Volatility of the Public Agenda: Trends From 1954 to 1994. *Public Opinion Quarterly*, 59(4), 495.
<https://doi.org/10.1086/269491>
- McConnell, A. (2010). Policy Success, Policy Failure and Grey Areas In-Between. *Journal of Public Policy*, 30(3), 345–362. <https://doi.org/10.1017/S0143814X10000152>
- McLevey, J. (2014). Think Tanks , Funding , and the Politics of Policy Knowledge in Canada. *Canadian Review of Sociology*, 51(1), 54–75.
- McLevey, J. (2021). *Doing computational social science*. London: SAGE.
- Mcpherson, M., Smith-Lovin, L., & Cook, J. M. (2001). Birds of a Feather : Homophily in

- Social Networks. *Annual Review of Sociology*, 27(2001), 415–444.
- Meadowcroft, J. (2016). Let's Get This Transition Moving! *Canadian Public Policy*, 42(S1), S10–S17. <https://doi.org/10.3138/cpp.2015-028>
- Metz, F., Leifeld, P., & Ingold, K. (2018). Interdependent policy instrument preferences: a two-mode network approach. *Journal of Public Policy*, 1–28. <https://doi.org/10.1017/S0143814X18000181>
- Meyer, D. S. (2004). Protest and Political Opportunities. *Annual Review of Sociology*, 30, 125–145. <https://doi.org/10.1146/annurev.soc.30.012703.110545>
- Meyer, D. S., & Minkoff, D. C. (2004). Conceptualizing Political Opportunity. *Social Forces*, 82(4), 1457–1492.
- Mintz, E., Tossutti, L., & Dunn, C. (Eds.). (2014). *Canada's Politics: Democracy, Diversity, and Good Government* (2nd ed.). Don Mills: Pearson Longman.
- Morris, M., Handcock, M. S., & Hunter, D. R. (2008). Specification of Exponential-Family Random Graph Models: Terms and Computational Aspects. *Journal of Statistical Software*, 24(4), 1548–7660. <https://doi.org/10.18637/jss.v024.i04>
- Moscato, D. (2016). Cultural Resiliency and the Rise of Indigenous Media. *Media and Communication*, 4(2), 38. <https://doi.org/10.17645/mac.v4i2.312>
- Moyson, S. (2017). Cognition and policy change : the consistency of policy learning in the advocacy coalition framework. *Policy and Society*, 36(2), 320–344. <https://doi.org/10.1080/14494035.2017.1322259>
- Moyson, S., Scholten, P., & Weible, C. M. (2017). Policy learning and policy change : theorizing their relations from different perspectives. *Policy and Society*, 36(2), 161–177. <https://doi.org/10.1080/14494035.2017.1331879>

- Murphy, R. (2021). *The Fossil-Fuelled Climate Crisis*. Cham: Springer International Publishing.
<https://doi.org/10.1007/978-3-030-53325-0>
- Nordhaus, W. D. (1994). *Managing the Global Commons: The Economics of Climate Change*. Cambridge: MIT Press.
- Nordhaus, W. D., & Boyer, J. (2000). *Warming the World: Economic Models of Global Warming*. Cambridge: MIT Press.
- Ontario government passes legislation to cancel cap-and-trade. (2018, October 31). *Global News*.
 Retrieved from <https://globalnews.ca/news/4614204/ontario-cap-and-trade-cancelled/>
- Opposition Kyoto bill passes third reading. (2007, February 14). *CTV News*.
- Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. New York: Cambridge University Press.
- Ostrom, E. (2007). Institutional Rational Choice: An Assessment of the Institutional Analysis and Development Framework. In P. A. Sabatier (Ed.), *Theories of the Policy Process* (pp. 21–64). Boulder: Westview Press.
- Ostrom, E. (2009). *Understanding Institutional Diversity*. Princeton: Princeton University Press.
- Peters, B. G., & Zittoun, P. (Eds.). (2016). *Contemporary Approaches to Public Policy: Theories, Controversies and Perspectives*. London: Palgrave Macmillan UK.
<https://doi.org/10.1057/978-1-137-50494-4>
- PM says he will “respect” Kyoto bill. (2007, February 15). *CBC News*. Retrieved from <https://www.cbc.ca/news/canada/pm-says-he-will-respect-kyoto-bill-1.658789>
- Pratt, L. (1982). Energy: The Roots of National Policy. *Studies in Political Economy*, 7(1), 27–59. <https://doi.org/10.1080/19187033.1982.11675694>
- Preciado, P., Snijders, T. A. B., Burk, W. J., Stattin, H., & Kerr, M. (2011). Does proximity

matter? Distance dependence of adolescent friendships. *Social Networks*.

<https://doi.org/10.1016/j.socnet.2011.01.002>

Premier Rachel Notley pulls Alberta out of federal climate plan over Trans Mountain ruling.

(2018, August 30). *CBC News*. Retrieved from

<https://www.cbc.ca/news/canada/edmonton/alberta-jason-kenney-political-reaction-rachel-notley-kinder-morgan-pipeline-1.4805224>

Putnam, R. D., Leonardi, R., & Nonetti, R. Y. (1994). *Making Democracy Work*. Princeton University Press. <https://doi.org/10.2307/j.ctt7s8r7>

Raab, J. (2002). Where Do Policy Networks Come From? *Journal of Public Administration Research and Theory*, 12(4), 581–622.

Rabe, B. G. (2007). Beyond Kyoto: Climate Change Policy in Multilevel Governance Systems. *Governance*, 20(3), 423–444. <https://doi.org/10.1111/j.1468-0491.2007.00365.x>

Ramón-Hidalgo, A.-E., Kozak, R. A., Harshaw, H. W., & Tindall, D. B. (2018). Differential Effects of Cognitive and Structural Social Capital on Empowerment in Two Community Ecotourism Projects in Ghana. *Society & Natural Resources*, 31(1), 57–73. <https://doi.org/10.1080/08941920.2017.1364454>

Rhodes, E., & Jaccard, M. (2013). A Tale of Two Climate Policies: Political Economy of British Columbia's Carbon Tax and Clean Electricity Standard. *Canadian Public Policy*, 39(SUPPL.2), S37–S51. <https://doi.org/10.3138/CP.39.Supplement2.S37>

Richards, G. W. (2018). The Science–Policy Relationship Hierarchy (SPRHi) model of co-production: how climate science organizations have influenced the policy process in Canadian case studies. *Policy Sciences*, (0123456789), 1–29. <https://doi.org/10.1007/s11077-018-9328-2>

- Rinscheid, A. (2020). Business Power in Noisy Politics: An Exploration Based on Discourse Network Analysis and Survey Data. *Politics and Governance*, 8(2), 286–297.
<https://doi.org/10.17645/pag.v8i2.2580>
- Rivera, L. A. (2012). Hiring as Cultural Matching: The Case of Elite Professional Service Firms. *American Sociological Review*, 77(6), 999–1022.
<https://doi.org/10.1177/0003122412463213>
- Robins, G., & Daraganova, G. (2013). Social Selection, Dyadic Covariates, and Geospatial Effects. *Exponential Random Graph Models for Social Networks: Theory, Methods, and Applications*, 91–101. <https://doi.org/10.1017/CBO9780511894701.010>
- Robins, G., Lewis, J. M., & Wang, P. (2012). Statistical Network Analysis for Analyzing Policy Networks. *Policy Studies Journal*, 40(3), 375–401. <https://doi.org/10.1111/j.1541-0072.2012.00458.x>
- Robins, G., Pattison, P., & Wang, P. (2009). Closure, connectivity and degree distributions: Exponential random graph (p^*) models for directed social networks. *Social Networks*, 31, 105–117. <https://doi.org/10.1016/j.socnet.2008.10.006>
- Rootes, C., Zito, A., & Barry, J. (2012). Climate change, national politics and grassroots action: an introduction. *Environmental Politics*, 21(5), 677–690.
<https://doi.org/10.1080/09644016.2012.720098>
- Rosa, L., Davis, K. F., Rulli, M. C., & D’Odorico, P. (2017). Environmental consequences of oil production from oil sands. *Earth’s Future*, 5, 158–170. <https://doi.org/10.1002/ef2.179>
- Russell, A., Dwidar, M., Jones, B. D., Russell, A., Dwidar, M., & Jones, B. D. (2016). The Mass Media and the Policy Process. In *Oxford Research Encyclopedia of Politics*. Oxford University Press. <https://doi.org/10.1093/acrefore/9780190228637.013.240>

- Sabatier, P. A., Hunter, S., & McLaughlin, S. (1987). The Devil Shift: Perceptions and Misperceptions of Opponents. *Western Political Quarterly*, 40(3), 449–476.
- Sabatier, P. A., & Jenkins-Smith, H. C. (1993). *Policy Change and Learning: An Advocacy Coalition Approach*. Boulder: Westview Press.
- Satoh, K., Gronow, A., & Ylä-Anttila, T. (2021). The Advocacy Coalition Index: A new approach for identifying advocacy coalitions. *Policy Studies Journal*, (January 2020), 1–21. <https://doi.org/10.1111/psj.12450>
- Schaefer, D. R. (2011). Youth co-offending networks: An investigation of social and spatial effects. *Social Networks*. <https://doi.org/10.1016/j.socnet.2011.02.001>
- Schaub, S., & Metz, F. (2020). Comparing Discourse and Policy Network Approaches: Evidence from Water Policy on Micropollutants. *Politics and Governance*, 8(2), 184–199. <https://doi.org/10.17645/pag.v8i2.2597>
- Schirle, T. (2015). Canadian Public Policy, University of Toronto Press. *Canadian Public Policy*, 41(4), 309–319.
- Schott, S. (2013). Carbon Pricing Options for Canada. *Canadian Public Policy / Analyse de Politiques*, 39(SUPPL.2), S109–S124. <https://doi.org/10.3138/CPP.39.Supplement2.S109>
- Shalizi, C. R., & Thomas, A. C. (2011). Homophily and Contagion Are Generically Confounded in Observational Social Network Studies. *Sociological Methods & Research*, 40(2), 211–239. <https://doi.org/10.1177/0049124111404820>
- Shum, D. (2016, December 21). Cost of cap-and-trade for Ontario consumers beginning Jan. 1, 2017. *Global News*. Retrieved from <https://globalnews.ca/news/3140617/cost-of-cap-and-trade-for-ontario-consumers-beginning-jan-1-2017/>
- Slowey, G., & Stefanick, L. (2015). Development at what cost? First nations, ecological

- integrity, and democracy. In M. Shrivastava & L. Stefanick (Eds.), *Alberta oil and the decline of democracy in Canada*. Edmonton: Athabasca University Press.
- Smith, J. A., Moody, J., & Morgan, J. H. (2017). Network sampling coverage II: The effect of non-random missing data on network measurement. *Social Networks*, 48, 78–99.
<https://doi.org/10.1016/j.socnet.2016.04.005>
- Snijders, T. A. B., Pattison, P. E., Robins, G. L., & Handcock, M. S. (2004). New specifications for exponential random graph models. *Sociological Methodology*, 36(2006), 44.
<https://doi.org/10.1111/j.1467-9531.2006.00176.x>
- Snijders, T. A. B., van de Bunt, G. G., & Steglich, C. E. G. G. (2010). Introduction to stochastic actor-based models for network dynamics. *Social Networks*, 32(1), 44–60.
<https://doi.org/10.1016/j.socnet.2009.02.004>
- Snow, D. A., Rochford, E. B., Worden, S. K., & Benford, R. D. (1986). Frame Alignment Processes, Micromobilization, and Movement Participation. *American Sociological Review*, 51(4), 464–481.
- Stephenson, E., Doukas, A., & Shaw, K. (2012). “Greenwashing gas: Might a ‘transition fuel’ label legitimize carbon-intensive natural gas development?” *Energy Policy*, 46(2012), 452–459. <https://doi.org/10.1016/j.enpol.2012.04.010>
- Stern, P. C., Dietz, T., & Ostrom, E. (2002). Perspective : Research on the Commons: Lessons for Environmental Resource Managers. *Environmental Practice*, 4(2), 61–64.
<https://doi.org/10.1017/S1466046602021038>
- Stoddart, M. C. J., Haluza-DeLay, R., & Tindall, D. B. (2016). Canadian News Media Coverage of Climate Change: Historical Trajectories, Dominant Frames, and International Comparisons. *Society and Natural Resources*, 29(2), 218–232.

<https://doi.org/10.1080/08941920.2015.1054569>

Stoddart, M. C. J., Mattoni, A., & McLevey, J. (2020). *Industrial Development & Eco-Tourisms*.

Cham: Springer International Publishing. <https://doi.org/10.1007/978-3-030-55944-1>

Stoddart, M. C. J., McCurdy, P., Slawinski, N., & Collins, C. G. (2020). Envisioning energy futures in the North Atlantic oil industry: Avoidance, persistence, and transformation as responses to climate change. *Energy Research & Social Science*, 69, 101662.

<https://doi.org/10.1016/j.erss.2020.101662>

Stoddart, M. C. J., Ramos, H., Foster, K., & Ylä-Anttila, T. (2021). Competing Crises? Media Coverage and Framing of Climate Change During the COVID-19 Pandemic. *Environmental Communication*, 1–17. <https://doi.org/10.1080/17524032.2021.1969978>

Stoddart, M. C. J., Ramos, H., & Tindall, D. B. (2015). Environmentalists' Mediawork for Jumbo Pass and the Tobeatic Wilderness, Canada: Combining Text-Centred and Activist-Centred Approaches to News Media and Social Movements. *Social Movement Studies*, 14(1), 75–91. <https://doi.org/10.1080/14742837.2013.831344>

Stoddart, M. C. J., & Smith, J. (2016). The Endangered Arctic, the Arctic as Resource Frontier: Canadian News Media Narratives of Climate Change and the North. *Canadian Review of Sociology/Revue Canadienne de Sociologie*, 53(3), 316–336.

<https://doi.org/10.1111/cars.12111>

Stoddart, M. C. J., Smith, J., & Tindall, D. B. (2016). Blame Canada: Environmental Movements, National Media and Canada's Reputation as a Climate Villain. In W. K. Carroll & K. Sarker (Eds.), *A World to Win: Contemporary Social Movements and Counter-Hegemony* (pp. 250–266). ARP Books.

Stoddart, M. C. J., & Tindall, D. B. (2010). “We’ve also become quite good friends”:

- Environmentalists, social networks and social comparison in British Columbia, Canada. *Social Movement Studies*, 9(3), 253–271. <https://doi.org/10.1080/14742837.2010.493658>
- Stoddart, M. C. J., & Tindall, D. B. (2015). Canadian news media and the cultural dynamics of multilevel climate governance. *Environmental Politics*, 24(3), 401–422. <https://doi.org/10.1080/09644016.2015.1008249>
- Stoddart, M. C. J., Tindall, D. B., Smith, J., & Haluza-Delay, R. (2017). Media Access and Political Efficacy in the Eco-politics of Climate Change: Canadian National News and Mediated Policy Networks. *Environmental Communication*, 11(3), 386–400. <https://doi.org/10.1080/17524032.2016.1275731>
- Stoddart, M. C. J., Ylä-Anttila, T., & Tindall, D. B. (2017). Media, politics, and climate change: the ASA Task Force report and beyond. *Environmental Sociology*, 3(4), 309–320. <https://doi.org/10.1080/23251042.2017.1329613>
- Stoett, P. J. (2012). *Global ecopolitics*. Toronto: University of Toronto Press.
- Stokman, F. N., & Zeggelink, E. P. H. (1996). Is politics power or policy oriented? A comparative analysis of dynamic access models in policy networks*. *The Journal of Mathematical Sociology*, 21(1–2), 77–111. <https://doi.org/10.1080/0022250X.1996.9990175>
- Tarrow, S. (2011). *Power in Movement: Social Movements and Contentious Politics* (3rd ed.). New York: Cambridge University Press. <https://doi.org/10.1192/bjp.112.483.211-a>
- Taylor, D. E. (2000). The Rise of the Environmental Justice Paradigm. *American Behavioral Scientist*, 43(4), 508–580.
- Thomas-Muller, C. (2014). The rise of the native rights-based strategic framework: Our last best hope to save our water, air, and earth. In T. Black, S. D’arcy, T. Weiss, & J. K. Russell

- (Eds.), *A Line in the Tar Sand: Struggles for Environmental Justice*. PM Press.
- Tindall, D. B. (2002). Social Networks, Identification and Participation in an Environmental Movement: Low-Medium Cost Activism within the British Columbia Wilderness Preservation Movement. *Canadian Review of Sociology*, 39(4), 413–452.
- Tindall, D. B. (2004). Social movement participation over time: An ego-network approach to micro-mobilization. *Sociological Focus*, 37(2), 163–184.
<https://doi.org/10.1080/00380237.2004.10571240>
- Tindall, D. B. (2014). Networks , Political. In *Encyclopedia of Social Media and Politics* (pp. 883–888). SAGE.
- Tindall, D. B. (2019). “Explaining Perceived Influence in Climate Change Policy Networks.” Presented at the Comparing Climate Change Policy Networks (COMPON) Workshop, October 2019, at the University of Bern, Bern, Switzerland.
- Tindall, D. B., & Piggot, G. (2015). Influence of social ties to environmentalists on public climate change perceptions. *Nature Climate Change*, 5, 546–549.
<https://doi.org/10.1038/NCLIMATE2597>
- Tindall, D. B., & Robinson, J. L. (2017). Collective action to save the ancient temperate rainforest: Social networks and environmental activism in clayoquot sound. *Ecology and Society*, 22(1). <https://doi.org/10.5751/ES-09042-220140>
- Tindall, D. B., Stoddart, M. C. J., & Callison, C. (2018). The Relationships Between Climate Change News Coverage, Policy Debate, and Societal Decisions. In *Oxford Research Encyclopedia of Climate Science* (pp. 1–38). Oxford University Press.
<https://doi.org/10.1093/acrefore/9780190228620.013.370>
- Tindall, D. B., Stoddart, M. C. J., & Howe, A. C. (2020). Social Networks and Climate Change

- Policy Preferences: Structural Location and Policy Actor Support for Fossil Fuel Production. *Society & Natural Resources*, 33(11), 1359–1379.
<https://doi.org/10.1080/08941920.2020.1783730>
- Tindall, D. B., & Wellman, B. (2001). Canada as Social Structure: Social Network Analysis and Canadian Sociology. *Canadian Journal of Sociology / Cahiers Canadiens de Sociologie*, 26(3), 265. <https://doi.org/10.2307/3341889>
- Traag, V. A., Waltman, L., & van Eck, N. J. (2019). From Louvain to Leiden: guaranteeing well-connected communities. *Scientific Reports*, 9(1), 5233. <https://doi.org/10.1038/s41598-019-41695-z>
- Tuck, E. (2009). Suspending Damage: A Letter to Communities. *Harvard Educational Review*, 79(3), 409–428. <https://doi.org/10.17763/haer.79.3.n0016675661t3n15>
- Tuck, E., & Yang, K. W. (2014). R-Words: Refusing Research. In D. Paris & M. T. Winn (Eds.), *Humanizing Research: Decolonizing Qualitative Inquiry with Youth and Communities* (pp. 223–248). London: SAGE Publications, Inc. <https://doi.org/10.4135/9781544329611.n12>
- van Aelst, P. (2014). Media, political agendas and public policy. In C. Reinemann (Ed.), *Political Communication: Handbook of Communication Science* (pp. 231–248). Berlin: De Gruyter-Mouton. <https://doi.org/10.1515/9783110238174.231>
- Van Epp, M., & Garside, B. (2019). Towards an evidence base on the value of social learning-oriented approaches in the context of climate change and food security. *Environmental Policy and Governance*, 29(2), 118–131. <https://doi.org/10.1002/eet.1835>
- Vliegthart, R., Walgrave, S., Baumgartner, F. R., Bevan, S., Breunig, C., Brouard, S., ... Tresch, A. (2016a). Do the media set the parliamentary agenda? A comparative study in seven countries. *European Journal of Political Research*, 55(2), 283–301.

<https://doi.org/10.1111/1475-6765.12134>

Vliegenthart, R., Walgrave, S., Baumgartner, F. R., Bevan, S., Breunig, C., Brouard, S., ...

Tresch, A. (2016b). Do the media set the parliamentary agenda? A comparative study in seven countries. *European Journal of Political Research*, 55(2), 283–301.

<https://doi.org/10.1111/1475-6765.12134>

Vliegenthart, R., Walgrave, S., Wouters, R., Hutter, S., Jennings, W., Gava, R., ... Chaques-

bonafont, L. (2016). The Media as a Dual Mediator of the Political Agenda – Setting Effect of Protest. A Longitudinal Study in Six Western European Countries. *Social Forces*, 95(2), 837–859. <https://doi.org/10.1093/sf/sow075>

Wagner, P. M., Ylä-Anttila, T., Gronow, A., Ocelík, P., Schmidt, L., & Delicado, A. (2021).

Information exchange networks at the climate science-policy interface: Evidence from the Czech Republic, Finland, Ireland, and Portugal. *Governance*, 34(1), 211–228.

<https://doi.org/10.1111/gove.12484>

Wagner, P., & Ylä-Anttila, T. (2018). Who got their way? Advocacy coalitions and the Irish

climate change law. *Environmental Politics*, 27(5), 872–891.

<https://doi.org/10.1080/09644016.2018.1458406>

Walgrave, S., & Vliegenthart, R. (2012). The complex agenda-setting power of protest:

demonstrations, media, parliament, government, and legislation in Belgium, 1993–2000. *Mobilization*, 17(2), 129–156.

Wallaschek, S., Starke, C., & Brüning, C. (2020). Solidarity in the Public Sphere: A Discourse

Network Analysis of German Newspapers (2008–2017). *Politics and Governance*, 8(2), 257–271. <https://doi.org/10.17645/pag.v8i2.2609>

Wang, P., Robins, G., Pattison, P., & Lazega, E. (2016). Social selection models for multilevel

- networks. *Social Networks*, 44, 346–362. <https://doi.org/10.1016/j.socnet.2014.12.003>
- Wasserman, S., & Faust, K. (1994). *Social Network Analysis: Methods and Applications*. Cambridge: Cambridge University Press.
- Weible, C. M. (2018). Instrument Constituencies and the Advocacy Coalition Framework : an essay on the comparisons , opportunities , and intersections Instrument Constituencies and the Advocacy Coalition intersections. *Policy and Society*, 37(1), 59–73. <https://doi.org/10.1080/14494035.2018.1417705>
- Weible, C. M., & Cairney, P. (2018). Practical lessons from policy theories. *Policy & Politics*, 46(2), 183–197. <https://doi.org/10.1332/030557318X15230059147191>
- Weible, C. M., & Ingold, K. (2018). Why advocacy coalitions matter and practical insights about them. *Policy & Politics*, 46(2), 325–343. <https://doi.org/10.1332/030557318X15230061739399>
- Weible, C. M., & Jenkins-Smith, H. C. (2016). The Advocacy Coalition Framework : An Approach for the Comparative Analysis of Contentious Policy Issues. In B. G. Peters & P. Zittoun (Eds.), *Contemporary Approaches to Public Policy: Theories, Controversies and Perspectives* (pp. 15–34). London: Palgrave Macmillan UK. <https://doi.org/10.1057/978-1-137-50494-4>
- Weible, C. M., & Sabatier, P. A. (2011). Advocacy Coalition Framework. In B. Badie, D. Berg-Schlosser, & L. Morlino (Eds.), *International Encyclopedia of Political Science* (pp. 34–37). Thousand Oaks: SAGE.
- Whyte, K. (2017). Indigenous Climate Change Studies: Indigenizing Futures, Decolonizing the Anthropocene. *English Language Notes*, 55(1), 153–162.
- Wilkes, R., Corrigan-Brown, C., & Myers, D. J. (2010). Packaging Protest: Media Coverage of

- Indigenous People's Collective Action. *Canadian Review of Sociology*, 47(4), 327–357.
<https://doi.org/10.1111/j.1755-618X.2010.01243.x>
- Wilkes, R., Corrigan-Brown, C., & Ricard, D. (2010). Nationalism and Media Coverage of Indigenous People's Collective Action in Canada. *American Indian Culture & Research Journal*, 34(4), 41–59.
- Wilson, P. (2015). The misuse of the Vuong test for non-nested models to test for zero-inflation. *Economics Letters*, 127, 51–53. <https://doi.org/10.1016/j.econlet.2014.12.029>
- Wright, G. (2015). An empirical examination of the relationship between nonresponse rate and nonresponse bias. *Statistical Journal of the IAOS*, 31(2), 305–315.
<https://doi.org/10.3233/sji-140844>
- Ylä-Anttila, T., Gronow, A., Stoddart, M. C. J., Broadbent, J., Schneider, V., & Tindall, D. B. (2018). Climate change policy networks: Why and how to compare them across countries. *Energy Research & Social Science*, 45(November 2017), 258–265.
<https://doi.org/10.1016/j.erss.2018.06.020>
- Ylä-anttila, T., Vesa, J., Eranti, V., Kukkonen, A., Lehtimäki, T., Lonkila, M., & Luhtakallio, E. (2018). Up with ecology , down with economy ? The consolidation of the idea of climate change mitigation in the global public sphere. *European Journal of Communication*, 33(6), 587–603. <https://doi.org/10.1177/0267323118790155>
- Young, N., & Dugas, E. (2011). Representations of Climate Change in Canadian National Print Media: The Banalization of Global Warming. *Canadian Review of Sociology*, 48(1), 1–22.
- Žnidaršič, A., Doreian, P., & Ferligoj, A. (2012). Absent ties in social networks, their treatments, and blockmodeling outcomes. *Metodoloski Zvezki*, 9(2), 119–138.
<https://doi.org/10.51936/redp2838>

Appendices

Appendix A Interview Schedule

A.1 Preamble to main Canada COMPON interview: Version 1 (February 18th, 2015)

Before we get started with the interview, I'll give you a brief overview of the study, and you can ask any questions you might have.

The UBC Climate Change Policy Networks study seeks to understand how people and organizations communicate about, and work to shape climate change policy in Canada. The project is funded by the Canadian government, through a grant from the Social Sciences and Humanities Research Council.

(If someone asks, the grant # is: F10-05404).

The main focus of this study is upon the social networks of organizations and individuals around climate change policy issues. When we use the term “social network” we do not mean it in the contemporary popular sense of social media (though this is one way in which groups and individuals might interact with one another). We mean it in a more general way; e.g., who are the organizations that you and/or your organization communicate with, exchange information with, and work with on various issues.

There are two parts to the study: an online component with mostly closed-ended question, and an open-end question component that may be done in an interview context.

Your participation in the study is purely voluntary. You can choose not to answer any questions, and can withdraw from the study at any time.

We will be sending an e-mail to you in the next few weeks about the online survey.

The names of individuals who participate in the survey will be kept confidential.

Do you agree to continue with the interview?

When we start the interview, I would like to use a digital recorder.

(For phone interviews, say, this is a device like an earphone, between my ear and the telephone receiver.)

Is this o.k.?

Do you have any questions?

(Answer any questions. See Scripted Responses for typical replies to questions.)

We will now begin the interview. I am now turning on the digital recorder.

SCRIPTED REPLIES TO TYPICAL QUESTIONS:

Q: What is the study about?

Answer: The Climate Change Policy Networks is an academic study that seeks to understand how people and organizations communicate about, and work to shape climate change policy in Canada.

Further elaboration: We are hoping that the study will provide a greater understanding of the array of perceptions about climate change policy options that exist, and the distribution of support that exists for different options amongst various groups.

The findings from this research may be useful for individuals and organizations involved in future policy making.

Q: What will the data be used for?

Answer: for writing academic journal articles, and possibly a book, or some book chapters about climate change and climate change policies in Canada.

Q: Who will have access to the data?

Answer: the principal investigator (David Tindall), and a few members of the research team which includes some other university professors, and some graduate students.

Q: Will participants receive a report of the findings?

Answer: we will endeavor to provide a report that summarizes some of the key findings to participants who are interested in receiving it. It will likely be a couple of years before we are able to produce such a report.

A.2 Interview questionnaire

ID#:

Name:

Interviewer:

Interview date:

1. (If R is a representative of an organization:)

Can you tell me a little bit about your organization? (E.g., its mission and activities.)

2. What is your title and job in your organization:

3a. Could you tell me a little about your background with regard to climate change?

3b. What sort of work are you currently doing on this issue? (In the context of the organization.)

4a. What is your opinion of climate change politics in Canada?

4b. What do you think is the best solution to these (climate change) problems?

5. How do you think policy making in Canada can or should address climate change issues?

6a. (Q Re. Social Networks.) What types of people and organizations do you personally interact with regarding climate policy?

6b. What types of people and organizations does your organization interact with regarding climate policy?

6c. Why do you interact with these people or organizations?

7. What is your assessment of the Paris COP21 Climate Change Agreement?

8. What is your assessment of Canada's participation in, and contribution to the Paris COP 21 Climate Change Agreement?

9. What is, and what should be the role of science/scientists in policy-making processes?

10. What is, and what should be the role of environmental NGOs in policy-making processes?

11. What is, and what should be the role of media in climate change policy-making processes?

12. Can you think of anything else I should know about your (or your organization's) involvement in climate change policy, or do you have anything to add about issues that I did not ask you about?

- Thank you for taking the time to answer all of these questions today, it was very interesting.
- We will be in touch in the next few weeks and we'll send you an email link to the online component of the survey whenever you have time.
- If you do have any further questions feel free to contact me by email or by phone. I greatly appreciate your participation.

A.3 Appendix Note Regarding Interview Schedule

Some interview questions were slightly modified, and a few questions were added during the interview process based on the researchers' experiences. In particular, question series 6, and questions 7 and 8 were only asked of a few respondents, near the end, after the Paris COP21 conference. Consequently, only the few respondents who participated in interviews during 2016 received these questions.

UBC Climate Change Policy Networks Study

- **Contact Details**

Please provide your contact details in the boxes below.

ID: The code provided to you

Name:

Organisation:

Phone number:

Email address:

Welcome to the Climate Change Policy Networks Study

The Climate Change Policy Networks study seeks to understand how people and organizations work to shape climate change policy in Canada. The project is funded by the Canadian government, through a grant from the Social Sciences and Humanities Research Council (Grant number: F10-05404). This is a funding source that is available to academics (such as university professors), for conducting social science research.

Thank you for agreeing to participate in this survey! We are surveying people from government, civil society (such as NGOs), business, consulting, academia, media, and the scientific community, in order to map out the process of climate change policy making. As you and/or your organization has been involved in climate change debates in Canada, we are very interested in surveying you about your (or your organization's) positions and activities relating to climate change.

Our study focuses in particular on social networks – the patterns of communication, and other types of interactions you have with other policy actors (such as organizations, and individuals). We will also ask about your (or your organization's) views about specific climate change policy issues and related topics. Part of our survey involves a short interview (either in person, or over the telephone), and part involves this online survey questionnaire

I would like to emphasize, that participation in the survey is purely voluntary. You may decline to answer specific questions, and you may withdraw from the interview at any time. If you have any questions, please feel free to contact me at 1-604-822-2363 or email tindall@mail.ubc.ca.

If you have any questions about your rights as a research participant, please contact the UBC Research Subject Information Line at 604-822-8598.

For technical questions about the survey, please e-mail: soci.climate.change.policy@ubc.ca, or call 604-822-9615

The names of individuals and organizations who participate in the survey will be kept confidential.

At the end of the survey you will be asked to provide your consent to participate in the study by clicking on the “submit survey” button. You can save the survey at any time and return to complete it at your convenience.

I believe you will find your participation interesting, and I hope that you will decide to participate in our survey.

Sincerely,

Dr. David Tindall,
Principal Investigator,
Associate Professor Department of Sociology
Email: tindall@mail.ubc.ca
Telephone: (604) 822-2363

Section 1. Perceptions of Climate Change

Below is a list of statements regarding the nature of global climate change as a phenomenon and as a policy issue. These issues are stated in a one-sided manner to allow for agreement or disagreement.

Please choose the option that best reflects the level of agreement/disagreement in your group's typical policy stance with the issue as stated, or your own view if you are participating as an individual (from strongly disagree to strongly agree).

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Global climate change is currently occurring.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Human activities are an important driver of current global climate change.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. On the whole, current trends suggest climate change will be beneficial for Canada.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. On the whole, current trends suggest climate change will be detrimental for the world.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Canada should give priority to climate change above other issues (development, security, stability, competitiveness, etc.).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. The world should give priority to other issues (development, security, stability, competitiveness, etc.) above climate change.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 2. Activities

We are interested in the activities organizations undertake regarding climate change. Using the four response categories: often, rarely, never, or don't know, please indicate the level of effort your organization devotes to each type of activity regarding climate change. If you are responding as an individual (rather than as a representative of an organization), please respond with regard to your own activities or if an item is not applicable to you as an individual click on "Not Applicable".

Research and Decision-Making

	No, never	Yes, rarely	Yes, often	Don't know	Not Applicable
1. Deciding upon climate change policy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Providing expert information to decision-makers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Research on climate change issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

External Activities

	No, never	Yes, rarely	Yes, often	Don't know	Not Applicable
4. Participation in climate change related networks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Hosting of forums for multi-stakeholder engagement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Publication of scientific results	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Participation in international forums and conferences (e.g. UNFCCC)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Public actions (demonstrations, strikes, lawsuits, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Influencing Government

	No, never	Yes, rarely	Yes, often	Don't know	Not Applicable
9. Direct lobbying	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Participation in government advisory councils, commissions, panel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Campaigning: petitions, resolutions, public letters, conferences	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Project implementation: work on contract from government	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Influencing Business

	No, never	Yes, rarely	Yes, often	Don't know	Not Applicable
13. Participation in business advisory councils, commissions, panels	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Influencing business policy: legal cases, public protests, etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Campaigning: petitions, resolutions, public letters, conferences	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. Project implementation: work on contract from business	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Influencing the Public

	No, never	Yes, rarely	Yes, often	Don't know	Not Applicable
17. Campaigns, talks and publications to change public awareness and behavior	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. Education, training and/or technical assistance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	No, never	Yes, rarely	Yes, often	Don't know	Not Applicable
19. Other: (Please specify by typing below):	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 3. Policy Positions

Next, we want you to think about the important national climate change issues that your group is considering. The table below states issues in a one-sided manner to allow for agreement/disagreement.

Please choose the option that best reflects the typical policy stance of your group on the issue, or your own view (if you are participating as an individual).

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Canada should aim for more ambitious domestic action to reduce emissions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Canada should take global leadership by boldly reducing its greenhouse gas emissions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. The best way to cut greenhouse gas emissions is through voluntary action by Canadian industries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Emissions trading (cap and trade) could make a significant contribution to reducing greenhouse gas emissions in Canada	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. A federal carbon tax could make a significant contribution to reducing greenhouse gas emissions in Canada	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Carbon offsetting could make a significant contribution to reducing greenhouse gas emissions in Canada	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Canada should expand nuclear power to cut greenhouse gas emissions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Canada should expand its use of natural gas to cut greenhouse gas emissions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Canada should restrict mining and export of oil sands to cut greenhouse gas emissions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Canada should enact and follow a low-carbon economy plan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. A low-carbon economy will be an economic boon for Canada in the long run	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

12. Canada needs to expand support/subsidies for renewable energy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Canada should set renewable energy targets at the Federal level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. A strong, binding international agreement is necessary for effective global reductions in greenhouse gas emissions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Without strong commitments from the US, it makes little sense for Canada to reduce its own GHG emissions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. Without strong commitments from China, it makes little sense for Canada to reduce its own GHG emissions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. Canada should take strong action to reduce emissions regardless of other countries' actions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. Canada should commit more international funding to reduce greenhouse gas emissions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. Canada's role/proposals in the international negotiations (UNFCCC) are too ambitious	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. Carbon, capture & storage for coal-fired power plants is necessary to meet both energy and carbon reduction goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Communication Networks: Questions about your frequency of communication with different organizations and individuals.

- In the next question we will ask about your communication with different organizations and individuals.
- While the list continues over a number of pages, it should not take as long to complete this question as it might seem at first glance.
- If you/your organization has had no communication with a particular actor, you can either indicate this by clicking on "Never", or by leaving the row blank (the latter will save you time).
- Please note we identified the organizations and individuals that appear on the list by using a systematic sampling procedure. Actors were included because of their participation in particular policy processes, and/or because of their inclusion in national print news media. We expect that a number of organizations/individuals will be unknown to some respondents, and there may be some organizations/individuals that you are surprised are not on the list. This will likely be due to the sampling procedures we undertook.

Section 4. Communication Networks

The following question focuses your/your organization's communication with other organizations and/or individuals, which we call "policy actors." Please answer each question by putting a check mark in the relevant column, for each policy actor on the list. Please indicate important organizations or individuals who are not on the list by marking the "other" category, and then listing their names in the space at the bottom of each page.

Question 4. How frequently [do you] does your organization communicate with each of the following organizations or individuals?

Please indicate your answer by checking one appropriate column. The organizations are grouped into categories below.

The column choices are as follows:

1. Never. (You may either click on 'Never' or leave the row blank.)
2. Occasionally (A few times a year.)
3. Regularly (More than a few times a year, but less than once a month.)
4. Often (Once a month or more often.)

4.01. Governmental Organizations (e.g. Bureaus, Departments, Agencies, Research Institutes, Funding Agencies, Courts, Public Corporations):

	1. Never	2. Occasionally (A few times a year)	3. Regularly (More than a few times a year)	4. Often (Monthly or more often)
Arctic Athabaskan Council	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Agriculture and Agri-Food Canada	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Assembly of First Nations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
British High Commissioner to Canada	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
City of St.John's	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
City of Toronto	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Commissioner of the Environment and Sustainable Development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environment Canada	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Government of Alberta	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Government of British Columbia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Government of Manitoba	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Government of Nova Scotia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Government of Nunavut	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Government of Ontario	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Government of Quebec	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Government of Saskatchewan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Government of the Northwest Territories	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	1. Never	2. Occasionally (A few times a year)	3. Regularly (More than a few times a year)	4. Often (Monthly or more often)
ICLEI Canada - Local Governments for Sustainability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
International Development Research Centre	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
National Research Council	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Natural Resources Canada	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Royal BC Museum	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Saskatchewan Research Council	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SaskPower	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Town of Churchill, MB	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other Governmental Organizations (Please specify by typing below):	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="text"/>				

4.02 Political Parties or Party-Related:

	1. Never	2. Occasionally (A few times a year)	3. Regularly (More than a few times a year)	4. Often (Monthly or more often)
Bloc Quebecois	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conservative Party	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Green Party of Canada	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Liberal Party of Canada	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Federal NDP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NDP - British Columbia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other Political Parties (Please specify by typing below):	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="text"/>				

4.03 Institutes/Think Tanks:

	1. Never	2. Occasionally (A few times a year)	3. Regularly (More than a few times a year)	4. Often (Monthly or more often)
C.D. Howe Institute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Canada West Foundation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fraser Institute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
International Institute for Sustainable Development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pembina Institute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sustainable Prosperity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other Institutes (Please specify by typing below):	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4.04 University Based Research Institutes:

	1. Never	2. Occasionally (A few times a year)	3. Regularly (More than a few times a year)	4. Often (Monthly or more often)
Balsillie School of International Affairs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carleton University	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dalhousie University	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lakehead University	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
McGill University	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ryerson University	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Simon Fraser University	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trent University	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
University of Alberta	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
University of British Columbia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
University of Calgary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
University of Guelph	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
University of Manitoba	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
University of Ottawa	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
University of Regina	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
University of Toronto	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
University of Victoria	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
University of Western Ontario	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
University of Windsor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
York University	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other University Research Institutes (Please specify by typing below):	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4.05 NGOs:

	1. Never	2. Occasionally (A few times a year)	3. Regularly (More than a few times a year)	4. Often (Monthly or more often)
CARE (Cooperative for Assistance and Relief Everywhere)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Climate Action Network Canada	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Climate Reality Canada	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
David Suzuki Foundation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ecojustice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Energy Probe	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental Defence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental Services Association of Nova Scotia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Équiterre	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ForestEthics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Forest Stewardship Council	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Friends of the Earth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Green Club	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Greenpeace	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
International Air Transport Association	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
International Emissions Trading Association	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
International Organization for Migration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inuit Circumpolar Council	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nature Conservancy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
OXFAM International	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pollution Probe	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	1. Never	2. Occasionally (A few times a year)	3. Regularly (More than a few times a year)	4. Often (Monthly or more often)

Rainforest Alliance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sage Foundation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sierra Club	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wildlife Conservation Society	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wildlands League	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
World Wildlife Fund Canada	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other NGOs (Please specify by typing below):	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="text"/>				

4.06 Business Groups/Trade Associations/Unions:

	1. Never	2. Occasionally (A few times a year)	3. Regularly (More than a few times a year)	4. Often (Monthly or more often)
BC Chamber of Commerce	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Canadian Bar Association	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Canadian Council of Chief Executives	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Canadian Institute of Chartered Accountants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Canadian Taxpayers Federation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other Business groups (Please specify by typing below):	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="text"/>				

4.07 Businesses:

	1. Never	2. Occasionally (A few times a year)	3. Regularly (More than a few times a year)	4. Often (Monthly or more often)
Alliance of Canadian Manufacturers and Exporters	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bank of Montreal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Canadian Association of Petroleum Producers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Canadian Electricity Association	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Canadian Gas Association	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chemistry Industry Association of Canada	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CIBC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EnCana	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enviroeconomics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environics Group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Forest Products Association of Canada	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Green & Gold Inc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Greenhouse Emissions Management Consortium	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lloyd's Register	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Montreal Exchange	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Norton Rose Canada LLP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shell Canada	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Suncor Energy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
TD Bank Financial Group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
TransAlta	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vancity Credit Union	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
WDA Consulting Inc	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	1. Never	2. Occasionally (A few times a year)	3. Regularly (More than a few times a year)	4. Often (Monthly or more often)
Zerofootprint	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other Businesses (Please
specify by typing below):



4.08 News Media Organizations:

	1. Never	2. Occasionally (A few times a year)	3. Regularly (More than a few times a year)	4. Often (Monthly or more often)
Calgary Herald	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CBC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CTV	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Global Television Network	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Globe and Mail	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Le Devoir	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
National Post	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ottawa Citizen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Radio Canada	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reuters	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sun News Network	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Toronto Star	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other News Media Organizations (Please specify by typing below):	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4.09 Media Reporters and Commentators:

(Please note – we will only ask you about these individuals once.)

	1. Never	2. Occasionally (A few times a year)	3. Regularly (More than a few times a year)	4. Often (Monthly or more often)
Kathryn Blaze Carlson	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Steve Brearton	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Claudia Cattaneo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Terence Corcoran	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Zoe Cormier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bill Curry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Satya Das	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Scott Deveau	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
David Evans	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Peter Foster	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Justine Hunter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
John Ibbitson	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Barbara Kay	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
John Lorinc	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gary Mason	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shawn McCarthy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Martin Mittelstaedt	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gwyn Morgan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Margaret Munro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Benny Peiser	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eric Reguly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carrie Tait	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nathan Vanderklippe	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dawn Walton	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Margaret Wente	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Geoffrey York	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	1. Never	2. Occasionally (A few times a year)	3. Regularly (More than a few times a year)	4. Often (Monthly or more often)
Other Media Reporters (Please specify by typing below):	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<div></div>				

4.10 Individuals:

	1. Never	2. Occasionally (A few times a year)	3. Regularly (More than a few times a year)	4. Often (Monthly or more often)
Leona Aglukkaq	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rona Ambrose	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
John Baird	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tim Ball	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
John Bennett	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tzeporah Berman	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Michael Byers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gordon Campbell	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Andrew Coyne	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nathan Cullen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mike De Souza	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stephane Dion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Roger Gibbins	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stephen Harper	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kathryn Harrison	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thomas Homer-Dixon	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Matt Horne	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Will Horter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mike Hudema	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mark Jaccard	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	1. Never	2. Occasionally (A few times a year)	3. Regularly (More than a few times a year)	4. Often (Monthly or more often)

Peter Kent	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Naomi Klein	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Andrew Leach	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Marc Lee	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ezra Levant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Preston Manning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ian Mauro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Elizabeth May	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
David McGuinty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ross McKittrick	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
David Miller	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
John Miller	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Patrick Moore	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rex Murphy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Andrew Nikiforuk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Joe Oliver	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Matt Price	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gregor Robertson	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jeff Rubin	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Graham Saul	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
David Schindler	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jeffrey Simpson	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lawrence Solomon	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
David Suzuki	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lindsay Tefler	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Andrew Weaver	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other Individuals (Please specify by typing below):	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Policy Network: Questions your perceptions about, and relationships with different organizations and individuals.

- In the next section we will ask 4 questions about your perceptions about the influence of different organizations/individuals, and about your/or your organization's relationship with different organizations and individuals.
- If you do not know the organization or individual, you can leave the row blank. • If you do know the organization or individual, please answer as many of the 4 questions as are applicable. Multiple responses per row are appropriate here.
- Similar to the previous question about communication networks, while the list continues over a number of pages, it should not take as long to complete this question as it might seem at first glance.
- Also, similar to the previous question about communication networks, we identified the organizations and individuals that appear on the list by using a systematic sampling procedure. Actors were included because of their participation in particular policy processes, and/or because of their inclusion in national print news media. We expect that a number of organizations/individuals will be unknown to some respondents, and there may be some organizations/individuals that you are surprised are not on the list. This will likely be due to the sampling procedures we undertook.

Section 5. Policy Networks

The following questions focus on your/your organization's relations with other organizations and/or individuals, which we call "policy actors." Please answer each question by putting a check mark in the relevant column, for each policy actor on the list. Please indicate important organizations or individuals who are not on the list by marking the "other" category, and then listing their names in the space at the bottom of each page.

Question 5.1. Which policy actors are especially influential in domestic climate change politics? Please indicate your answer by putting a mark after their names in column 1.

Question 5.2. Who are your or your organization's sources of expert scientific information about climate change? Please indicate your answer by putting a mark after their names in column 2.

Question 5.3. Please mark all the policy actors that have a strong influence you or your organization's stance related to climate change. Please put a mark after their names in column 3.

Question 5.4: With which other policy actors do you or does your organization collaborate regularly concerning climate change issues and politics? Please put a mark after their names in column 4.

5.01 Governmental Organizations (e.g. Bureaus, Departments, Agencies, Research Institutes, Funding Agencies, Courts, Public Corporations):

	1. Influential in domestic climate change politics	2. Gives expert scientific info	3. Influences my org's policy positions	4. Collaborate with regularly
Arctic Athabaskan Council	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Agriculture and Agri-Food Canada	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Assembly of First Nations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
British High Commissioner to Canada	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
City of St.John's	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
City of Toronto	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Commissioner of the Environment and Sustainable Development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environment Canada	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Government of Alberta	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Government of British Columbia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Government of Manitoba	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Government of Nova Scotia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Government of Nunavut	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Government of Ontario	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Government of Quebec	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Government of Saskatchewan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Government of the Northwest Territories	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Government of Yukon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	1. Influential in domestic climate change politics	2. Gives expert scientific info	3. Influences my org's policy positions	4. Collaborate with regularly
ICLEI Canada - Local Governments for Sustainability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
International Development Research Centre	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
National Research Council	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Natural Resources Canada	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Royal BC Museum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Saskatchewan Research Council	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SaskPower	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Town of Churchill, MB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other Government Organizations (Please specify by typing below):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<div></div>				

5.02 Political Parties or Party-Related:

	1. Influential in domestic climate change politics	2. Gives expert scientific info	3. Influences my org's policy positions	4. Collaborate with regularly
Bloc Quebecois	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conservative Party	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Green Party of Canada	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Liberal Party of Canada	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Federal NDP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NDP - British Columbia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Political Parties - Other (Please specify by typing below):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="text"/>				

5.03 Institutes/Think Tanks (independent):

	1. Influential in domestic climate change politics	2. Gives expert scientific info	3. Influences my org's policy positions	4. Collaborate with regularly
C.D. Howe Institute	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Canada West Foundation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fraser Institute	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
International Institute for Sustainable Development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pembina Institute	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sustainable Prosperity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other Institutes (Please specify by typing below):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="text"/>				

5.04 University Based Research Institutes:

	1. Influential in domestic climate change politics	2. Gives expert scientific info	3. Influences my org's policy positions	4. Collaborate with regularly
Balsillie School of International Affairs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Carleton University	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dalhousie University	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lakehead University	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
McGill University	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ryerson University	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Simon Fraser University	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trent University	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
University of Alberta	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
University of British Columbia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
University of Calgary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
University of Guelph	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
University of Manitoba	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
University of Ottawa	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
University of Regina	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
University of Toronto	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
University of Victoria	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
University of Western Ontario	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
University of Windsor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
York University	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other University Research Institutes (Please specify by typing below):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5.05 NGOs

	1. Influential in domestic climate change politics	2. Gives expert scientific info	3. Influences my org's policy positions	4. Collaborate with regularly
CARE (Cooperative for Assistance and Relief Everywhere)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Climate Action Network Canada	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Climate Reality Canada	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
David Suzuki Foundation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ecojustice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Energy Probe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental Defence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental Services Association of Nova Scotia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Équiterre	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ForestEthics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forest Stewardship Council	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Friends of the Earth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Green Club	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Greenpeace	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
International Air Transport Association	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
International Emissions Trading Association	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
International Organization for Migration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inuit Circumpolar Council	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1. Influential in domestic climate change politics	2. Gives expert	3. Influences my org's policy positions	4. Collaborate with regularly

		scientific info		
Nature Conservancy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OXFAM International	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pollution Probe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rainforest Alliance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sage Foundation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sierra Club	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wildlife Conservation Society	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wildlands League	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
World Wildlife Fund Canada	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other NGOs (Please specify by typing below):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<div></div>				

5.06 Business Groups/Trade Associations/Unions:

	1. Influential in domestic climate change politics	2. Gives expert scientific info	3. Influences my org's policy positions	4. Collaborate with regularly
BC Chamber of Commerce	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Canadian Bar Association	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Canadian Council of Chief Executives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Canadian Institute of Chartered Accountants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Canadian Taxpayers Federation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other Business Groups (Please specify by typing below):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<div></div>				

5.07 Businesses:

	1. Influential in domestic climate change politics	2. Gives expert scientific info	3. Influences my org's policy positions	4. Collaborate with regularly
Alliance of Canadian Manufacturers and Exporters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bank of Montreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Canadian Association of Petroleum Producers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Canadian Electricity Association	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Canadian Gas Association	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1. Influential in domestic climate change politics	2. Gives expert scientific info	3. Influences my org's policy positions	4. Collaborate with regularly

Chemistry Industry Association of Canada	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CIBC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EnCana	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Enviroeconomics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environics Group	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forest Products Association of Canada	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Green & Gold Inc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Greenhouse Emissions Management Consortium	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lloyd's Register	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Montreal Exchange	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Norton Rose Canada LLP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shell Canada	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Suncor Energy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TD Bank Financial Group	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TransAlta	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vancity Credit Union	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WDA Consulting Inc	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Zerofootprint	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other Businesses (Please specify by typing below):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5.08 News Media Organizations:

	1. Influential in domestic climate change politics	2. Gives expert scientific info	3. Influences my org's policy positions	4. Collaborate with regularly
Calgary Herald	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CBC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CTV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Global Television Network	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Globe and Mail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Le Devoir	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
National Post	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ottawa Citizen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radio Canada	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reuters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sun News Network	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Toronto Star	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other News Media Organizations (Please specify by typing below):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5.09 Individuals:

These individuals have been involved in climate change policy discussions in various ways, some as members of organizations and some as individuals.

	1. Influential in domestic climate change politics	2. Gives expert scientific info	3. Influences my org's policy positions	4. Collaborate with regularly
Leona Aglukkaq	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rona Ambrose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
John Baird	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tim Ball	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
John Bennett	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tzeporah Berman	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Michael Byers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gordon Campbell	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Andrew Coyne	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nathan Cullen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mike De Souza	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stephane Dion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Roger Gibbins	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stephen Harper	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Kathryn Harrison	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Thomas Homer-Dixon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Matt Horne	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Will Horter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mike Hudema	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mark Jaccard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Peter Kent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Naomi Klein	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Andrew Leach	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Marc Lee	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ezra Levant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	1. Influential in domestic climate change politics	2. Gives expert scientific info	3. Influences my org's policy positions	4. Collaborate with regularly
Preston Manning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ian Mauro	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Elizabeth May	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
David McGuinty	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ross McKittrick	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
David Miller	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
John Miller	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Patrick Moore	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rex Murphy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Andrew Nikiforuk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Joe Oliver	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Matt Price	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gregor Robertson	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Jeff Rubin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Graham Saul	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
David Schindler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Jeffrey Simpson	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lawrence Solomon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
David Suzuki	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lindsay Tefler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Andrew Weaver	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other Individuals (Please specify by typing below):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<div></div>				

Section 6. Development Priorities

Which should take priority for developing countries: reducing greenhouse gas emissions OR adaptation to the damage caused by climate change?

- ☐ Reducing greenhouse gas emissions
- ☐ Adapting to climate change

Section 7. Views on National and International Issues

Next we want to talk about the stance of your organization (or your view, if you are participating as an individual) on important international and national issues regarding anthropogenic climate change.

Please check the column that best reflects the level of agreement/disagreement of you or your organization's typical policy stance with the issue as stated.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Reforestation and strategies to avoid deforestation are central to reducing global GHG emissions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Climate change science is still too uncertain to be a basis for policy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. The IPCC report presents the best science on climate change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Any post-Kyoto international climate change treaty needs to include ALL major emitters	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Anthropogenic climate change cannot be contained as long as developed countries continue their excessive consumption	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. International organizations do not understand the particular climate change circumstances of Canada	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. In Canada, business interests are a major obstacle to reducing GHG emissions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. In Canada, weak government law enforcement is a major obstacle to reducing GHG emissions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. In Canada, lack of public concern is a major obstacle to reducing GHG emissions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
10. In Canada biased media representation is a major obstacle to reducing GHG emissions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Canada should make its own climate change policies and standards rather than relying on international agreements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Reduction of energy use in transport is crucial to lowering GHG emissions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 8. National Policy Debates, Proposals and Decisions

Below are climate-related proposals being discussed in Canada. These proposals may have been accepted and adopted recently, or they may still be under discussion.

8.1. Please indicate your organization's position on this issue, or your position if you are participating as an individual (as stated).

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. National reduction of GHG emissions by 30% below 2005 levels by 2030	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Coal-fired power plant emissions performance standards (implemented in summer of 2015)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Transportation emissions standards for greenhouse gas emissions from vehicles.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Canada's withdrawal from the Kyoto protocol	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Creating a price on carbon at a Federal level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8.2. Which of the following activities did you or your organization undertake to try to influence the outcome of each policy issue? Please put a check by all that apply for each debate/policy category. If items are not applicable please leave them blank or check 'Not applicable'. Multiple responses per row are applicable if appropriate.

	National reduction target	Coal power plant standards	Transport standards	Withdrawal from Kyoto protocol	Federal carbon pricing	Not applicable
1. Lobbying: Informal contacts with political parties, government officials to advocate for your position.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Policy-making: Formal testimony at hearings, participation on government advisory committee, draft legislation proposals or text.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Technical analysis: Distribution of data analysis, policy analysis, research documents.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Discussion forums: Exchange ideas and preferences with other interested groups.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	National reduction target	Coal power plant standards	Transport standards	Withdrawal from Kyoto protocol	Federal carbon pricing	Not applicable
5. Media and publicity: Press releases, press conferences, advertising to publicize your position.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Activation: Collect signatures on petitions, call or send letters or emails to politicians or officials.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Mobilization: Street demonstrations, mass meetings, non- violent direct action to bring attention to the issue.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Networking and coalition-building: Building new relationships with or among organizations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Other activity: (Please specify your own response below):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section 9. International Negotiations

9.1. What is your organization's position (or your position if you are participating as an individual) on each of the following issues? Multiple responses per row are applicable if appropriate.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. There should be an international binding commitment on all nations to reduce GHG emissions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. There should be an international GHG trading system in a global carbon market based on NAMAs (National Appropriate Mitigation Actions).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. The Clean Development Mechanism program should expand to include support for nuclear power facilities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. The REDD plus mechanism is a good policy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9.2. Are you or your organization active within international negotiations or with international coalitions on these issues?

- ☐ Yes
- ☐ No

9.3. Which of the following activities did you or your organization undertake to try to influence the outcome of these proposals? (Listed at the top of the columns below) Multiple responses per row are applicable if appropriate.

	International binding commitment	GHG trading based on NAMAs	Expansion of CDM to include nuclear	REDD plus mechanism
1. Lobbying: Informal contacts with political parties, government officials to advocate for your position.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Policy-making: Formal testimony at hearings, participation on government advisory committee, draft legislation proposals or text.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Technical analysis: Distribution of data analysis, policy analysis, research documents.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Discussion forums: Exchange ideas and preferences with other interested groups.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Media and publicity: Press releases, press conferences, advertising to publicize your position.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	International binding commitment	GHG trading based on NAMAs	Expansion of CDM to include nuclear	REDD plus mechanism
6. Activation: Collect signatures on petitions, call or send letters or emails to politicians or officials.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Mobilization: Street demonstrations, mass meetings, non-violent direct action to bring attention to the issue.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Networking and coalition-building: Building new relationships with or among organizations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Other (please specify by typing below):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<div></div>				

Section 10. Additional Comments

1. Is there anything else you would like to tell us about with regards to your/your organization's views and involvement in climate change issues that we have not asked you about?

Submit your questionnaire?

By selecting "YES" you will submit your responses to the questionnaire. By selecting 'YES' and submitting your responses you are providing your consent to participate in this study. Submit your questionnaire?

- ☐ Yes
- ☐ No

Thank you for your participation in this survey.

If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study, contact the Research Participant Complaint Line in the UBC Office of Research Ethics at 604-822-8598 or if long distance e-mail RSIL@ors.ubc.ca or call toll free 1-877-822-8598 (Toll Free: 1-877-822-8598).

Appendix C Core membership tables

Table 5.1 Summary of communities in interaction networks, detected using Leiden algorithm

Collaboration		Communication		Source for scientific information	
Substantive Community	List of actors	Substantive Community	List of actors	Substantive Community	List of actors
Environmental	Enviro_org01	Environmental	Enviro_org01	Environmental	Bus_Org05
	Enviro_org02		Enviro_org02		Enviro_org01
	Enviro_org03		Enviro_org03		Enviro_org05
	Enviro_org05		Enviro_org05		Enviro_Org08
	Enviro_Org08		Enviro_Org06		Fnc_Co01
	Enviro_Org09		Enviro_Org08		Uni07
	Fed_Pol_Pty01		Enviro_Org09		
	Munic_Gov01		Fed_Pol_Pty01		
			Prov_Gov_Org01		
			Uni02		
			Uni11		
Government	Bus_Org03	Government	Fed_Gov_Dept01	Government / think-tank	Enviro_org04
	Lgl_Org01		Munic_Gov01		Fed_Gov_Dept01
	Prov_Gov_Org01		Prov_Territ_Gov02		Prov_Gov_Org01
	Prov_Gov_Org02		Prov_Territ_Gov03		Prov_Gov_Org02
	Prov_Gov_Org03				Prov_Territ_Gov01
	Prov_Territ_Gov01				Prov_Territ_Gov02
	Prov_Territ_Gov03				TT02
	Uni05				TT03
	Uni11				TT04
					Uni11

Research	Fed_Gov_Dept01	Research	Fnc_Co01	Research	Bus_Org01
	Prov_Territ_Gov02		Lgl_Org01		Bus_Org02
	Uni02		Non-Uni_Rsrch_NGO01		Bus_Org03
	Uni03		TT01		Enviro_org03
	Uni04		Uni01		Enviro_Org09
	Uni06		Uni04		Fed_Pol_Pty01
	Uni08		Uni06		Uni01
	Uni10		Uni10		Uni02
	Uni12		Uni12		Uni03
	Uni13		Uni13		Uni04
					Uni05
					Uni06
					Uni08
					Uni09
					Uni12
					Uni13

Table 5.2 Summary of communities in interaction networks, detected using Leiden algorithm

Infl. domestic policy		Infl. on organization	
Substantive Community	List of actors	Substantive Community	List of actors
Environmental	Enviro_org01	Environmental	Enviro_org01
	Enviro_org02		Enviro_org02
	Enviro_org03		Enviro_org03
	Enviro_org04		Enviro_org05
	Enviro_Org06		Lgl_Org01
	Enviro_Org09		Munic_Gov01
	Munic_Gov01		Non-
	Non-		Uni_Rsrch_NGO01
	Uni_Rsrch_NGO0		Uni10
	Prov_Territ_Gov0		Uni13
	Uni03		
	Uni05		
	Uni11		
Government	Fed_Gov_Dept01	Government / business	Bus_Org02
	Fnc_Co01		Bus_Org03
	Munic_Gov02		Bus_Org04
	Prov_Gov_Org01		Bus_Org05
	Prov_Territ_Gov01		Fnc_Co01
	Prov_Territ_Gov03		Prov_Territ_Gov01
	Uni08		Prov_Territ_Gov02
			Prov_Territ_Gov03
			TT01
			TT04
			Uni07
			Uni08

Business	Bus_Org02	Other 1, Other 2, & Other 3	Bus_Org01
	Bus_Org03		Enviro_Org08
	Bus_Org04		Fed_Gov_Dept01
	Bus_Org05		Fed_Pol_Pty01
	Fed_Pol_Pty01		Munic_Gov02
	Lgl_Org01		Prov_Gov_Org01
	TT04		Prov_Gov_Org03
	Uni01		TT02
	Uni12		TT03
			Uni09
			Uni11
			Uni12

Table 5.3 Summary of membership of k -cores for all five networks.

Collaboration network	Communication network	Network of scientific info.	Network of domestic infl.	Network of infl. on organization
Bus_Org02			Bus_Org02	Bus_Org02
Bus_Org03		Bus_Org03	Bus_Org03	Bus_Org03
Bus_Org05			Bus_Org05	Bus_Org05
Enviro_org01	Enviro_org01		Enviro_org01	Enviro_org01
Enviro_org02				
Enviro_org03	Enviro_org03	Enviro_org03	Enviro_org03	Enviro_org03
Enviro_org05	Enviro_org05		Enviro_org05	Enviro_org05
Enviro_Org08	Enviro_Org08		Enviro_Org08	
Fed_Gov_Dept01		Fed_Gov_Dept01		
Fed_Pol_Pty01	Fed_Pol_Pty01	Fed_Pol_Pty01	Fed_Pol_Pty01	Fed_Pol_Pty01
Fnc_Co01			Fnc_Co01	Fnc_Co01
Lgl_Org01	Lgl_Org01		Lgl_Org01	Lgl_Org01
			Munic_Gov01	Munic_Gov01
			Prov_Gov_Org03	
Prov_Territ_Gov01	Prov_Territ_Gov01		Prov_Territ_Gov01	Prov_Territ_Gov01
Prov_Territ_Gov02	Prov_Territ_Gov02	Prov_Territ_Gov02	Prov_Territ_Gov02	Prov_Territ_Gov02
				Prov_Territ_Gov03
	TT01		TT01	
			TT02	
			TT03	
TT04	TT04	TT04	TT04	TT04
		Uni01		
		Uni02		
		Uni03		
		Uni04		
		Uni05		
		Uni07		
		Uni08		
Uni10	Uni10	Uni10		
Uni11	Uni11	Uni11		
Uni12	Uni12	Uni12		
Uni13	Uni13	Uni13		