

Understanding the Need for and Implications of Climate Change Based
Environmental Assessment in Canada

by

Scott Newall

A Thesis submitted to the Faculty of Graduate Studies of
The University of Manitoba
in partial fulfilment of the requirements of the degree of
MASTER OF NATURAL RESOURCES MANAGEMENT

Natural Resources Institute

Clayton H. Riddell Faculty of Environment Earth and Resources

University of Manitoba

Winnipeg, MB

November 25, 2020

Copyright © 2020 by Scott Newall

Abstract

Despite the efforts of the Federal Government to create a new Impact Assessment Act (2019) that included meaningful approaches for assessing the climate change contributions of projects as part of an environmental assessment, many would argue that these efforts fell well short. My thesis attempts to understand the factors that contribute to Canada's inability to develop and implement an effective climate change-based approach to environmental assessment, in addition to conceptualizing the best approaches for including climate change considerations in EA in Canada. To achieve this, I performed a review of relevant literature and conducted interviews with experts in fields related to environmental assessment, climate change, law, industry and politics. Interviews were designed to obtain perspectives on the barriers impeding a successful climate change approach in EA as well as thoughts on ways current processes could be improved.

The results of my work indicate that there are significant barriers to achieving a meaningful climate change-based EA process that stem from economic and political considerations, such as embedded economic inertia and the strength of industrial lobbies. There are also many concerns with how current processes in EA, or lack thereof, are addressing climate change. Additionally, my data reveals that there are several ways we can work to improve the consideration of climate in EA in Canada, such as through a proper strategic assessment of climate considerations that would answer key questions and provide guidance to industries and practitioners as to how our project level EA activities contribute to the achievement of our broader climate change goals in Canada. Additional changes to project assessment, such as determining the proper context through which project GHG emissions are analyzed and performing a thorough assessment of project alternatives 'to', would also help to improve the effectiveness of the of EA process in relation to climate considerations.

Table of Contents

1.0 Introduction	8
1.1 Research Purpose and Objectives	9
1.2 Approach	10
1.3. Contributions to Knowledge	11
1.4 Thesis Organization.....	12
2.0 Understanding EA in Context with Climate Science, Economics and Politics	14
2.1 Environmental Assessment (EA).....	14
2.1.1 The Purpose of Environmental Assessment	14
2.1.2 Environmental Assessment Legislation in Canada.....	16
2.1.3 Types of Environmental Assessment	18
2.1.4 Environmental Assessment Effectiveness	19
2.1.5 Environmental Assessment Discourse	20
2.1.6 Next Generation Environmental Assessment	21
2.2 Climate Change in a Canadian Context	24
2.2.1 The Current State of the Climate Problem	24
2.2.2 The Consequences of Inaction.....	24
2.3 The Economic Considerations of EA	25
2.3.1 Trade-offs & Valuation of the Environment	25
2.3.2 Path Dependency of the Canadian Economy.....	26
2.4 The Political Considerations of EA	28
2.4.1 Problem Denial and Blame Avoidance.....	28
2.4.2 The Influence of Industry	29
2.5 Summary.....	29
3.0 Research Design and Methods	31
3.1 Approach and Design	31
3.2 Data Collection Methods	32
3.2.1 Document Review.....	32
3.2.2 Interviews	33
3.3 Data Analysis	34

3.4 Validity	36
3.5 Ethics	36
4.0 Barriers to Effective Climate Change EA	38
4.1. Economic Considerations	39
4.1.1 Economic Inertia	40
4.1.2 Costs of addressing (or not addressing) Climate Change	42
4.1.3 Institutionalized Uncertainty	45
4.1.4 International Considerations	46
4.1.5 Provincial Variation.....	48
4.2 Political Considerations.....	50
4.2.1 Accountability in Politics.....	50
4.2.2 Electoral System	52
4.2.3 Federal and Provincial Governmental Relations.....	53
4.2.4 Incentives and Policy Development.....	54
4.2.5 Public Understanding and Misleading Information	57
4.2.6 Ideological Differences and Climate Change	60
4.3 Implementation Considerations.....	61
4.3.1 Lack of Context for Emissions	62
4.3.2 Problems with Assessing Alternatives	63
4.3.3 Lack of Clear Decision Criteria	64
4.3.4 Independence issues	65
4.3.5 Lack of Proper Forum for Discussing Climate Policy	66
4.3.6 Reconciling Federal Climate Policy with Energy Policy Decisions	67
4.4 Summary and Discussion	71
5.0 Moving forward with Climate Change EA.....	76
5.1 Connecting our International Climate Commitments to Environmental Assessment	77
5.2 Strategic Environmental Assessment	78
5.2.1 Deliverables of a useful Strategic Assessment of Climate Change Policy.....	80
5.3 Contextualizing Project Emissions	85
5.3.1 Carbon Budgeting	86
5.3.2 Emissions Accounting	91

5.3.3 Significance of Greenhouse Gas figures to Project EA.....	94
5.4 Project Listing and Triggering Approaches.....	96
5.5 Alternatives Assessment.....	100
5.6 Decision Making.....	104
5.7 Environmental Assessments as a GHG Mitigation Tool.....	109
5.8 Summary and Discussion.....	111
6.0 Conclusion and Recommendations.....	119
6.1 Barriers to Integrating Meaningful Climate Change Consideration in EA.....	119
6.1.1 Economics.....	119
6.1.2 Politics.....	122
6.1.3 Implementation.....	125
6.2 Effective Policy Approaches for Considering Climate Change in EA.....	128
6.3 Recommendations.....	131
6.4 Areas for Further Discovery.....	135
Works Cited.....	137
Appendix A - Draft Interview Questions.....	149
Appendix B – Final Participant Categories.....	152
Appendix C – Example Consent Form.....	153

List of Tables

Table 1 – **Barriers to Climate Change Considerations in EA**

Table 1 – **Opportunities to Improve Climate Change Considerations in EA**

Abbreviations and Acronyms

EA = Environmental Assessment

GHG = Greenhouse Gas

SEA = Strategic Environmental Assessment

REA = Regional Environmental Assessment

PPPs = Policies Plans and Programs

1.0 Introduction

In 2015, the Liberal Government of Canada began a nationwide conversation regarding the reform of the Canadian Environmental Assessment Act (CEAA). This was a decision that would stimulate discussions regarding how to create a meaningful, robust, and comprehensive environmental assessment (EA) process that allows for sustainable project development, while safeguarding the nation from significant adverse environmental effects and ensuring adequate participation among the public (Gibson, Doelle, & Sinclair, 2016). The Expert Panel struck by the Minister of Environment and Climate Change to consider next steps in regard to EA in Canada released its report titled *Building Common Ground: A New Vision for Impact Assessment in Canada*, which shows showed further evidence of the government's desire for a reformed process (Expert Panel, 2017). The Federal review of the CEAA provides valuable context for thinking about how we could improve EA processes in Canada, both at the federal level, but also in a general sense of the ancillary ideas that would support EA. The Federal Governments Strategic Assessment of Climate Change indicates that there is an interest in understanding how to incorporate climate change in EA at a more general level, and as such this thesis will explore issues applicable to the Federal EA process, but also general questions that effect how EA is conducted in Canada.

To begin conceptualizing improved EA legislation, it is important to understand the critiques of the existing Act. The CEAA was last revised in 2012 by the Conservative Government and was widely criticized for making EA less effective, less comprehensive, and generally absent of important long-term and holistic considerations (Doelle, 2012). This critique argues that the scope of the CEAA was too narrow, and therefore did not provide for adequate consideration of important factors such as cumulative effects or climate change (Gibson, 2012). An Act too limited in scope risks that it will not adequately achieve its purpose of avoiding adverse effects and achieving more sustainable development since temporal and regional scales do not bound many environmental threats.

Climate change is a perfect example of such a threat as it is an issue that transcends any specific project and embodies the need for a mindset that considers cumulative effects (Sinclair, Doelle, & Duinker, 2017). For these reasons, it is important to explore how climate change considerations should be included in EA because EA is currently the primary decision-making process regarding new major activities, and it is also an important forum for public involvement (Doelle, 2016). An EA process that includes considerations of climate change mitigation and impacts will lead to better informed decision making regarding the kind of activities we pursue and the broader context of their effects. By taking actions, such as this review of the EA process, and through other policy initiatives such as a national carbon tax of \$10 per ton increasing to \$50 per ton in 2022, the Liberal Government of Canada has shown interest in addressing the problem of climate change. Ideally, this interest manifests as substantive and valuable legislative changes that enshrine climate-based EA policies.

Within the review of CEAA 2012, there existed the space for exploration into how to use EA legislation as a tool for preventing significant adverse effects related to climate change. Since climate change is the manifestation of a multifaceted and boundless problem, any investigation into the practical implications of legislation designed to address it will need to be interdisciplinary in its approach and keep a mindset that is focused on the interactions of many different fields such as climate science, economics, policy and law. Understanding these interactions is important for effectively navigating the complexity and conflict surrounding the development of new EA legislation designed to mitigate climate change.

1.1 Research Purpose and Objectives

The central purpose of my master's thesis research is to understand the barriers to, and implications of, developing meaningful EA legislation in Canada designed to address climate change, with a goal of contributing to an understanding of the complexities, contradictions, and conflicts embodied within the subject. In fulfilling the purpose of this research, I have set the following specific objectives:

1. To create an inventory of challenges and barriers to integrating meaningful climate change considerations in EA in Canada.
2. To determine the most effective policy approaches for considering climate change in EA.
3. To establish specific recommendations for the incorporation of climate change in federal environmental assessments given the findings of objectives 1 and 2.

My research findings contribute to the knowledge base by informing answers to questions such as: What would climate change considerations look like in practical terms in the form of EA legislation? Are there any barriers to the acceptance and creation of climate change-based EA principles, and if so, what are they? What are the perspectives that contribute to these barriers, and how can we work to overcome them?

1.2 Approach

I maintained a constructivist worldview while performing my research since the questions posed were best answered by an understanding of how individuals create value and meaning related to climate change and EA, and the context and interactions that shape these judgments (Creswell, 2014). A constructivist worldview was appropriate for my research because the purpose, understanding the implications and barriers of climate change policy in EA, is a topic that is highly influenced by the values and meanings held by individuals and the way they interact in the context of this issue.

To complete my objectives, I used various qualitative data collection methods. My research purpose has a strong exploratory component, and therefore qualitative methods such as interviews and document review were well suited for the task. Literature and document review were an important for understanding barriers to incorporating climate considerations into EA. I used interviews to understand the perspectives of people who work closely with climate change and EA.

To gather the data to fulfill my objectives I performed a review of publications on EA reform, which included submissions made to the Expert Panel on EA reform and

documents produced by Environment and Climate Change Canada. I conducted interviews with individuals possessing expertise in fields such as EA law and policy, natural resource economics or climate science. Expertise was determined by referral from academic advisors, past academic publications, senior positions within the natural resource industry or federal agency related to environment and natural resources, or significant journalistic contributions to the subject. The interviews are intended to provide more detailed accounts of how the policies work in practice and any challenges that policymakers may expect to encounter during implementation.

Data analysis was conducted using Nvivo. Further details regarding my approach are discussed in Chapter 3.

1.3. Contributions to Knowledge

The results of this study contribute to the body of knowledge that helps to shape responsible next generation EA policy. The Impact Assessment Act 2019 is still relatively new and the process of understanding how to interpret the law in the context of project assessments is ongoing, so the findings and conclusions derived from this study will help to form a bank of evidence that can be used to navigate the complexity of the issue and suggest approaches to implementing climate change considerations into existing and new EA process in Canada (Government of Canada, 2019). It is important that EA policy is based on an adequate understanding of the conflict between the ecological reality of climate change and the political and economic systems that govern our society. Climate change will only become a more relevant and immediate concern as we progress, so I believe that the findings from this work are of interest to other jurisdictions considering climate change policies in EA as well as academics with an interest in this subject matter.

Further to this, if we hope to develop a cohesive approach to climate change and to appropriately utilize EA to help achieve our goals in this regard, we need to understand the systemic barriers that impede progress on climate related issues in Canada. This paper outlines many such barriers in the context of how they impede

improvements to climate change considerations in EA, but they are also applicable to many other climate change initiatives nationally. The more informed we can be regarding these barriers, the more we can develop strategies to prepare for them and therefore have more success in advancing progressive climate policies.

This paper also describes the kinds of problems that may need to be addressed alongside our push to improve climate change EA. It encourages thought beyond EA alone and provides insight into what issues may need concurrent resolution as we advance climate considerations in EA. In this way, advancing climate change EA is not considered inside a vacuum but instead together with all the ripple effects that may come from improving our laws in this regard. The process of improving EA is therefore approached by taking a larger lens and identifying socio-economic considerations that may be impacted by decision taking place in the EA sphere.

Finally, this paper describes the ways in which implementation of EA can be improved by discussing the barriers that exist within the process itself that have led to less than desirable outcomes. From this understanding, the paper suggests ways in which we could approach improvements to the process at the project level and explores what the process could look like if improved in this regard. This contributes to the well-established body of work on how EA processes could be improved, and it is valuable to continue adding to this subject as policy makers in charge of EA regulations have yet to sufficiently accept and implement their recommendations.

1.4 Thesis Organization

Following the introduction, in Chapter 2 I discuss literature that encompasses topics such climate science, economics, law and environmental policy to name a few, so that the context and background subject matter that supports my research is clearly defined. I then move into a discussion of my research design and methods in Chapter 3. In this chapter, further detail is provided regarding the documents chosen to review, and the means of selecting and contacting experts interviewed. Chapter 4 includes the results and discussion of my research on the subject of barriers to considering climate

change in EA. Chapter 5 includes the results and discussion on the subject of how to move forward with climate change considerations in EA. The last chapter of my thesis, Chapter 6, summarizes and conclude on the results of my research as they pertain to my objectives.

2.0 Understanding EA in Context with Climate Science, Economics and Politics

To inform my research, I reviewed literature on the subjects of EA, climate science, as well as economics and politics as they relate to climate and EA. I chose these subjects because they are significant in the way that they shape the policy discussions around EA reform. In Chapter 3, the literature review is used to help inform the basic frame for the analysis that I performed with the research data collected. As part of the literature review, I have examined academic publications, government reports, news articles and submissions to the expert panel on EA reform in Canada.

2.1 Environmental Assessment (EA)

2.1.1 The Purpose of Environmental Assessment

To understand the reform of the Canadian Environmental Assessment Act requires knowledge of the fundamental purpose and goals of EA as a policy tool and the process it follows. There are many ways to define EA, but the definition supported by the IAIA (International Association for Impact Assessment) is “The process of identifying, predicting, evaluating and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made” (IAIA & IEA, 1999, p. 2). This means that EA can be thought of as a planning tool used to make informed decisions about whether to permit new activities, and for those that are permitted, under what conditions should they be allowed to proceed (Doelle, 2008). It also ensures that the decision-making process encompasses an understanding and consideration of environmental implications (Doelle, 2008). As a planning tool, EA is about making predictions regarding the future consequences of proposed activities and evaluating the options in the context of the available alternatives to a proposed project (Doelle, 2008). To facilitate planning decision making, EA has a technical focus which seeks to analyze the possible impacts of development, but also a regulatory focus that ensures all procedures are followed and that relevant stakeholders have been consulted (Noble, 2015). In addition to its planning function, EA in Canada

also serves as the primary forum for public discussion of development projects, and therefore plays a role in ensuring that new projects are consistent with Canadian interests (Doelle, 2016). By facilitating informed decision making and encouraging collaboration among stakeholders, EA is a process that aims to strengthen environmental management in Canada (Noble, 2015).

To speak concretely, the objective of the EA process is to come to a decision about a project, policy, plan or program; however, depending on the lens through which EA is viewed, the specific objectives may diverge and sometimes act in conflict (Noble, 2015). Proponents may view EA as a bureaucratic road block to be overcome as quickly and inexpensively as possible, or as a means of improving project designs, whereas local community members may see it as nothing more than a public relations tool to placate the citizenry, or they may see it as a way for them to express their opinions and affect change in their community (Noble, 2015). Each person comes to the EA process with a different perspective and will therefore have different ideas about what the objective should be, in this way, coming to conclusions about the objectives of EA can be thought of as discursive process (Rozema, Bond, Cashmore, & Chilvers, 2012).

Despite differing perspectives, there are objectives of EA that are independent of context and distributions of power, and that can be broadly differentiated as output and outcome objectives for the EA process (Noble, 2015). Output objectives are measurable and attributable directly to the EA process, such as ensuring proponent accountability and compliance, or ensuring adequate public consultation; and outcome objectives relate to the long-term results of an effective EA process, such as protecting ecosystems and improving awareness of environmental concerns (Noble, 2015). Thinking in terms of outputs and outcomes displays the rationalist roots of the EA process, wherein the understanding is that following a certain set of procedures (i.e. gathering information, comparing projections, consulting with the public), that the logical consequence will be the best possible decision (Bond, Morrison-Saunders, & Howitt, 2013; Noble, 2015). Understanding the best possible outcome is itself a philosophical endeavor, and one way to conceptualize the outcome of a good EA process is that it

should be effective in balancing the concerns of stakeholders to promote social and ecological well-being and sustainability (Gibson, Doelle, & Sinclair, 2016).

The ability of EA to achieve desirable outcomes is dependent on the strength of the principles and values that guide it as a process and inform the methods through which it is performed (Hanna, 2015). Deficiencies in the legislation that exists now have been thoroughly discussed by academics (e.g., Doelle, 2012; Gibson, 2012), and one of the aspirations of the current EA reform process is that it will legislatively enshrine principles such as adequate public involvement and follow up, as well as incorporating climate change considerations.

2.1.2 Environmental Assessment Legislation in Canada

Understanding the history behind the Canadian Environmental Assessment Act (CEAA) is an important precursor to conducting my research. The Canadian Environmental Assessment Agency describes EA as a planning and decision-making tool intended to minimize adverse environmental effects (CEAA, 2017). A more detailed description also includes objectives for Canadian EA such as protecting the environment, facilitating the participation of the public and aboriginal communities, promoting cooperation and coordination between the federal and provincial authorities, promoting sustainable development, and encouraging studies of cumulative effects on a region, to name a few (CEAA, 2012). The Federal Act that governed EA in Canada until 2019 was the Canadian Environmental Assessment Act 2012 (CEAA 2012), which was drafted as part of budget implementation Bill C-38 and made significant changes to the CEAA 1995 (Doelle, 2012). Notification of changes to the CEAA 1995 were announced in March of 2012 and passed by the House of Commons in June 2012 (Doelle, 2012). The fact that the changes were implemented so quickly, and that opposition amendments to the bill were not accepted, insinuated that the Majority government in 2012 wanted to avoid debate and public attention as they fundamentally changed the nature of EA in Canada (Doelle, 2012). Changes to important aspects of the Act, such as the triggering process, the scope of considerations within EA, the effects deemed significant, and the timelines allowed for the process, served to undermine the strength of the Act as a tool for preventing adverse environmental effects (Doelle, 2012). EA is

also described as a means of ensuring that we identify, evaluate and incorporate the externalities of a proposed project in the final decision of whether it should be approved (Sinclair & Doelle, 2004). It makes sense that the CEAA was written with an intentionally broad purpose since it needs to encompass many activities and circumstances; however, such wording can serve to limit the potential of the Act. A more ambitious conceptualization of a next generation EA should speak explicitly about its intended overall objectives (Gibson, Doelle, & Sinclair, 2016). It is a positive sign that the Liberal Government in Canada acknowledges the need for an improved EA process and starting in 2016 engaged an expert panel to provide recommendations on how best to reform the CEAA. They have also specified the matter of incorporating climate change considerations into EA as a priority for this review. In 2019, the Federal Government of Canada signed the Impact Assessment Act into law. The Act takes step towards improving climate change considerations by requiring consideration of whether a project hinder or contributes to our climate change goals. New in the Act is that this consideration must be disclosed publicly and included in the Minister's decision statement (IAA, 2019).

In Canada, EAs are applied in multiple jurisdictions, both provincially and federally, and due to the cross-border nature of environmental problems, EAs are often conducted through inter-jurisdictional cooperation (Hanna, 2015). One of major critiques of a multi-jurisdictional system is that there is a risk of duplication of tasks, and to mitigate this, the Federal Government and the Provinces have signed harmonization agreements that facilitate co-operation and ensure that proponents are not presenting the same reports multiple times (Noble, 2015). Despite these harmonization agreements, the risk of task duplication among jurisdiction was used as a justification for one of the major changes as part of the CEAA 2012 legislation. Previously under CEAA 2012, in certain circumstances, a project can be deemed exempt from Federal EA and a provincial EA can instead be substituted and considered equivalent to Federal EA (Gibson, 2012). This is problematic because it is not guaranteed that the scope of a provincial assessment is sufficient to match what would have been covered under a federally conducted EA, and therefore risks the omissions of important national environmental concerns (Gibson, 2012). The scope of what is to be assessed as part of

an EA is an important factor that differentiates EA across federal and provincial jurisdiction. Some jurisdictions take an approach that is more focused on biophysical considerations while others are inclusive of consideration of the cultural and human dimensions of project impacts (Noble, 2015). It is recommended that Canada develop a comprehensive approach to EA and this requires better communication and cooperation among jurisdictions (Gibson, Doelle, & Sinclair, 2015). It is encouraging to see that the government has been willing to implement interim measures for addressing climate change in project EA until the full review is completed (NRC, 2016c). Some of these interim measures include assessing upstream emissions, extending the time frame for making decisions, and increased consultation with the public and first nations, all of which are beneficial in terms of performing an assessment that sufficiently addresses climate change concerns (NRC, 2016c).

2.1.3 Types of Environmental Assessment

There are different types of EA in practice, and common types in Canada are project based environmental impact assessment (EIA) and strategic environmental assessment (SEA). Project based EA was a requirement for projects that fall under the categories listed within the Canadian Environmental Assessment Act of 2012 (CEAA, 2012), and SEA is formally established through a Cabinet Directive brought forth by the Canadian Environmental Assessment Agency (Noble, 2009). SEA is not currently part of the existing Environmental Assessment Act, so it is non-statutory, removed from legislated EA process, and proceeds under a Cabinet Directive (Noble, 2009). In EIA, the assessment targets the environmental impacts of specific project, while SEA is focused on the environmental effects of policies, plans and programs and making decisions informed by knowledge of cumulative impacts (Macintosh, 2010). Regional environmental assessment (REA) is another type of assessment that is not required by CEAA legislation or by the impact assessment act 2019. REA is an assessment that is focused on the past, present and future impacts of a region, and region is best defined as an area that is not delineated by administrative boundaries, but by meaningful ecological considerations (e.g. an area such as a watershed or prairie) (Johnson, 2016; Duinker & Greig, 2006).

Recently, the focus of SEA has started to expand to consider the social and economic aspects of a project, and this shift of focus has led to the development of what are now referred to as sustainability assessments (SA) (Morrison-Saunders & Fischer, 2006). Moving towards an assessment process that is focused on sustainability-based evaluations has been suggested as the most appropriate way to structure future EA processes so that they yield the best long-term outcomes for society (Gibson, Doelle & Sinclair, 2016). Specifically, sustainability based evaluations will need to be based on a generalized set of sustainability criteria which can be conceptualized in terms of the following categories: maintenance of socio-ecological system integrity, commitment to livelihood sufficiency and opportunity, intergenerational equity, resource maintenance and efficiency, socio-ecological civility and democratic governance, precaution and adaptation, and immediate and long-term integration (Gibson, 2016). Sustainability is an inherently difficult concept to pin down and delineate for evaluation purposes, so sustainability assessments are conducted as a process of moving towards a general direction that will bring about the requirements for lasting well-being (Gibson, 2016). Much of the push towards a sustainability-based framework for EA is derived from the fact that EA as practiced now has not been effective in shifting decision making culture towards integration of genuine concern for environmental considerations and adverse effects (Gibson, Doelle & Sinclair, 2016).

2.1.4 Environmental Assessment Effectiveness

Studies of the contributions made by the EA process highlight important information regarding the success of the EA process in substantively influencing the outcomes of project decisions. One of the main themes that emerges from studies of EA effectiveness is that it is regarded as useful in terms of its contribution to knowledge, but it has not been fully integrated into the institutionalized patterns of decision making (Jay, Jones, Slinn & Wood, 2007). Analysis of the outcomes of EAs indicate that rarely does an EA alter the final project decision; however, it often influences stakeholder perceptions or serves to finely tune the parameters within which a project may be implemented (Cashmore, Gwilliam, Morgan, Cobb & Bond, 2004). This evidence insinuates that the “techno-rationalist” conception of EIA as a process that provides the

relevant scientific data to decision makers in order to come to a logically derived, rational and fact based decision is flawed because although stakeholders take in the information, other perspectives will hold greater sway in the final analysis (Jay et al., 2007). As an example, the role of politics in the project decision making process is one such variable that has been demonstrated to diminish the influence of the EIA in determining the project outcome (Leknes, 2001). The decision to approve the Trans Mountain and Line 3 pipelines while rejecting the Northern Gateway pipeline is one possible example of politics influencing the determination of whether projects go forth (Tasker, 2016a). Arguably, the Liberal Government was influenced by the political rationale for needing to approve some pipelines, while still accepting that further pipeline development is not conducive to their overall climate goals.

2.1.5 Environmental Assessment Discourse

What we can also understand from research into the discourses that surround EA is that it is a normative process (Rozema et al., 2012). EA can be interpreted as a means of protecting stakeholder values that are derived from wider social and political processes and enshrined within institutional and cultural norms of the EA process (Rozema et al., 2012). EA exists because we have learned to value certain outcomes over others, (e.g. having a clean environment), but determining where one outcome ranks in relation to another is dependent on many socio-political factors. An example of a discourse that heavily influences the way in which stakeholders view the value and purpose of EA is the differentiation between weak and strong conceptualizations of sustainability (Rozema et al., 2012). Weak sustainability accepts the concept of trade-off between forms of natural capital and socio-economic benefits viewing them as substitutable for one another (Ekins, Simon, Deutsch, Folke & De Groot, 2003). Strong sustainability supports that some forms of natural capital, and the ecosystem services the provided, are non-substitutable (Ekins et al., 2003). Interpreting EA through the lens of weak versus strong sustainability can have a significant impact on the relative balancing of environmental considerations in EA. As an example, in situations where socio-economic considerations are considered as substitutable for the environment, it is often the case that decisions favoring the environment become disadvantaged due to

the institutionalized power of economic and social interests (Morrison-Saunders & Fischer, 2006). This means that outcomes resulting in monetary compensation for environmental harm will be more common since they are considered substitutable.

2.1.6 Next Generation Environmental Assessment

Many suggestions for how to improve existing EA legislation in Canada have been put forth by practitioners and academics alike. The 2016-2017 review of the federal EA process has also led to an exhaustive source of recommendations from different sectors of Canadian society, such as the public, academia, NGO's and industry (Environmental Assessment Expert Panel, 2017). As mentioned previously, a shift towards sustainability-based outcomes has been widely discussed as the appropriate direction for the next generation of Canadian EA (Gibson, Doelle & Sinclair, 2016; EPA Caucus, 2016; WCEL 2017; Expert Panel 2017).

Sustainability based assessments encompass several specific changes to EA, but there are a few that pertain specifically to the ability of EA to appropriately address climate change concerns. Suggested improvements such as a linked and tiered assessment process, enhanced procedures for assessing and monitoring cumulative effects, and specific climate tests based on regional carbon budgets are examples of new ideas that would improve EA as a tool for accurately assessing project effects on climate change (Sinclair, Doelle, & Duinker, 2017; Gibson, Doelle, & Sinclair, 2016; Johnson, 2016a; Johnson, 2016b; Noble, 2010).

A linked and tiered EA process is one that includes strategic and regional level EA and project level EA, and ensures that the outcomes of the assessment processes are linked, and that the decision-making objectives of each assessment are appropriately defined so that big picture issues can be addressed at the appropriate level (Sinclair, Doelle, & Duinker, 2017; Gibson, Doelle, & Sinclair, 2016). Feedback between each level of assessment should go both ways; Project level EA is performed within the broader context of the strategic assessments but should also be used to further identify areas for strategic consideration (Sinclair, Doelle, & Duinker, 2017; Gibson, Doelle, & Sinclair, 2016). Using different tiers of assessments can also improve the triggering of the EA process since strategic and regional information can be used to

identify projects that are of more concern given a strategic and regional context, creating a “traffic light” approach to triggering (Johnson, 2016b). As an example, projects with high GHG emissions may be identified as high risk (red light) given strategic assessment of Canada’s broader commitments to climate change, therefore warranting more thorough assessment and mitigation measures.

The problem of climate change is essentially a cumulative effects problem of the largest scope imaginable, and therefore it should be addressed by a comprehensive SEA program that is guided by national climate change policies (EPA Caucus, 2016). This SEA program should be inclusive of meaningful and periodic cumulative effects assessments (CEA) that are performed on a regional scale (Johnson, 2016b). A meaningful CEA needs to address the problem described by Bram Noble as “the tyranny of small decisions” which refers to the ineptitude of project EA to comprehensively address cumulative effects because of the limited scope of individual assessments and a failure to consider projects in the context of other activities on the landscape (Noble, 2010). Project based EA is regarded as inadequate for addressing broader problems as there is a strong tendency to scope project EA narrowly, and assessments that account for regional and strategic considerations are suggested as an appropriate alternative the results of which then inform project EA. However, the undertaking of a proper regional assessment and most strategic assessments are thought to be beyond the capacity of any one project proponent since they require a large breadth and depth of understanding of a region, or control of a policy area, which would be unreasonable to expect from of any private proponent (Noble, 2010). Proper regional assessment that includes CEA requires input from proponents, regulators, the public, as well as other stakeholders knowledgeable in the effected region, and because of this it necessitates cooperation and sharing of information to a degree beyond that which is currently practiced in project based EA (Noble, 2010). To address these problems, the mindset through which stakeholders address cumulative effects needs to be re-envisioned so that all interactions between human activity and the ecosystem are presumed to have cumulative effects unless demonstrated otherwise (Sinclair, Doelle, & Duinker, 2017). The legal and policy aspects of CEA need to determine who is responsible for gathering the required information needed to perform the assessment

and entrench the requirement for strategic and regional assessments while also outlining how cumulative effects will influence project level decisions (Sinclair, Doelle, & Duinker, 2017). A revised CEA mindset will also encourage and support information sharing, learning and early engagement among the multiple stakeholders involved in a project decision, and this participatory focus is linked to the technical aspects of scoping, analysis and follow-up that form the structural components of CEA (Sinclair, Doelle, & Duinker, 2017). Consideration of cumulative effects in every step of an assessment, as suggested by Sinclair, Doelle, & Duinker (2017) relates directly to how we address the problems of climate change since it is a problem that manifests in every step of project development.

Emission tests based a carbon budgets set by Canada's international climate change commitments are suggested as a means of testing the cumulative effect of greenhouse gas emissions (Johnson, 2016b; Campbell & Pepper-Smith, 2016). According to Johnson (2016b), SEAs should identify and determine regional and sectoral carbon budgets that can then be used as a measure for assessing the cumulative impact of emissions; greenhouse gas emissions being the appropriate proxy for determining adverse climate impacts. Projects should be assessed based on how they contribute towards Canada's international climate goals and a pathway to decarbonization by 2050, this also means that the null option of no project approval at all must be considered as a viable alternative (Johnson, 2016b). The emissions accounting used to determine whether a project will pass or fail a test such as the one proposed is also a contentious in terms of what emissions should be attributed to a project. Currently, project EA is not required to consider the full lifecycle of project emissions, but many submissions to the Expert Panel on Environmental Assessment reform encouraged the inclusion of all emissions directly related to the project.

2.2 Climate Change in a Canadian Context

2.2.1 The Current State of the Climate Problem

The impetus for including climate change in EA comes from the science that shows we are quickly approaching unsafe limits of greenhouse gases in the atmosphere. The International Panel on Climate Change has reported that levels of carbon dioxide, methane and nitrous oxide in the atmosphere are higher than any other point in time in the last 800,000 years (IPCC, 2014a). This has led climate scientists to estimate the total amount of greenhouse gases the atmosphere can contain before we become locked-in to unsafe levels of warming. Scientists believe that to have a greater than 66% chance of maintaining average temperatures below 2 degrees Celsius, a carbon budget of approximately 590 – 1240 GtCO₂ is appropriate. Global emissions in 2014 were 40 GtCO₂ (Le Quere, Moriarty, Andrew, Peters, ...Zeng, et al., 2015), which is equivalent to approximately 15-30 years of current level emissions before we exceed this budget (Rogelj et al., 2016). Canada's emissions as of 2014 were approximately 732 MtCO₂ and although this represents only 1.6% of total global emissions, we are one of the ten highest global emitters (ECCC, 2016a) and our emissions per capita are ranked fourteenth in the world (World Bank, 2013). These facts bring to light that the need to address climate change is urgent, and that there is a strong argument for Canada to play a leading role in reducing its emissions through bold policy implementation.

2.2.2 The Consequences of Inaction

Appreciating why such urgent and comprehensive EA reforms are necessary requires an understanding of the consequences should humanity respond inadequately, or not at all, to the problem of climate change. One of the major concerns is that the frequency of extreme weather events such as extreme heat waves and precipitation will continue to increase as global average temperatures continue to rise (IPCC, 2014a). These events jeopardize the security of food systems and increase the likelihood of property damage or loss of life through devastating flood and hurricane events (Smith, Woodward, Campbell-Lendrum, Chadee, Honda et al., 2014). In addition, these changes can act as conflict multipliers by creating circumstances that increase the

likelihood of human conflict (Kelley, Mohtadi, Cane, Seager & Kushnir, 2015). As an example, the drought that was implicated as a major catalyst for the Syrian conflict of 2012 is thought to have been unusually severe because of recent climactic changes (Kelley et al., 2015). The warming observed prior to the conflict was not consistent with natural causes, rather it was in line with models depicting the influence of anthropogenic GHG emissions (Kelley et al., 2015). Mass-migrations also played a catalytic role in the Syrian conflict (Kelly et al., 2015), and climate change is regarded as having the potential to cause a widespread refugee crisis due to sea level rise.

Sea level rise is another significant consequence of inaction. Hundreds of millions of people from the East, Southeast and South Asia Region are expected to suffer the effects of coastal flooding by 2100, which will in turn force displacement of these populations (Saito, Gattuso, Hinkel, Khattabi, McInnes & Sallenger, 2013). This could lead to another, larger refugee crisis in the future in addition to all the economic and infrastructure losses related to the submergence of coastal settlements.

These are just a few of the many consequences that could result from unmitigated climate change. An important note to make is that these predictions are variable based on assumptions made regarding the level of mitigation, with more mitigation often resulting in a reduction of the severity of predicted impacts. For this reason, it is important that Canada develop an EA process that is effective in mitigating excessive GHG emissions. The implications of not properly addressing climate change are dire, and include increased arctic warming, ocean acidification, extreme weather events, all of which have profound negative effects on our society in terms of things like food security, population displacement, and global conflict (IPCC, 2014b).

2.3 The Economic Considerations of EA

2.3.1 Trade-offs & Valuation of the Environment

The issue of trade-offs is ubiquitous in policy discussions regarding EAs and environmental issues at large because we are always trading some cost for some benefit, or trying to identify the best, or least terrible, of multiple options (Hardisty,

2010). The way in which costs and benefits are measured, and the frame through which they are presented have a major impact on the perception of possible outcomes (Knetsch, 2007). Despite growing acknowledgement of the importance of environmental and social issues, the dominant frame through which environmental decisions are made is one of a quantitative, monetary focus (Hardisty, 2010; Knetsch, 2007). This is problematic because environmental and social issues are inherently hard to value monetarily, and therefore risks favoring short term financial outcomes due inadequate translation of the social and environmental costs into monetary terms (Hardisty, 2010). Tietenberg & Lewis (2012) argue that monetary valuation of the environment is necessary if we want to avoid tradeoff decisions that set a default value of zero dollars, therefore leading to decisions that justify significant degradation. This still leaves room for critiques regarding how an appropriate valuation should be determined, and if monetary valuation can be an accurate and consistent measure. For example, if a tradeoff is framed as an amount an individual would have to pay to fix environmental damage, the valuation will be different than had it been framed as a question of how much an individual would accept as compensation for the damage (Knetsch, 2007). Examples such as this highlight the problems of using monetary valuation as the primary lens through which tradeoffs are assessed. This also illustrates why having clear, legislated trade-off rules in EA is thought to be a requirement of a reformed EA process. Rather than focusing on monetary criteria, Gibson (2016) suggests criteria that focus on contributions to long-term stability. Some key components of Gibson's trade off rules include the requirement to justify trade-offs to all stakeholders, to prove an overall contribution to sustainability despite any adverse effects, and no displacement of adverse effects from the present to the future unless the alternative creates an even larger adverse effect (Gibson, 2016).

2.3.2 Path Dependency of the Canadian Economy

Path dependence in economics is the concept that forces in the economy, after becoming historically entrenched and sufficiently large in scale, tend to stay in place and maintain an advantage over competing ideas, industries, products, etc. (Arthur, 1994). With respect to climate change and the Canadian economy, I refer to path

dependence in the context of Canadian energy development and the prevailing imperative of economic growth.

One of the concerns with energy development is that we have locked-in to a highly energy intensive system which in turn commits us to unsustainable levels of GHG emissions (Fouquet, 2016; Unruh, 2002). In support of this concern we can look at some economic information regarding Canada's energy sector. In 2015, energy production accounted for 7.7% of nominal GDP, and represented 3.9% of employment in Canada (NRC, 2016a). If we look at specific provinces, like Alberta, the numbers are even more significant with energy industries accounting for 21.7% of GDP and 6.9% of employment (NRC, 2016a). In addition to contributions to GDP and employment, as of 2017, the Canadian oil and gas sector represents approximately 19% of the value of the Toronto Stock Exchange (TSX, 2017). Given that the energy sector is significantly entrenched in the Canadian economy, path dependency theory would suggest that there will be significant challenges to implementing policies that may act against increasing returns for the energy sector. Since oil company valuation is leveraged in estimations of probable reserves (Lee & Ellis, 2013), an EA process that calls into question the viability of fossil fuel reserves will consequently challenge the valuation of the Canadian energy sector. This will be an important consideration when thinking about economic barriers to meaningful inclusion of climate change in EA.

As a participant in the global economy, Canada is also beholden to the prevailing economic doctrine of continuous growth and development in service to increasing the national GDP. It is important to understand how this economic reality may influence EA policy decisions. There have been studies that suggest an inverted U-shaped environmental Kuznets curve with respect to GDP growth and environmental pollution (Grossman & Krueger, 1995; Seldon & Song, 1994). This suggests that CO₂ emissions should increase as a country develops, but once it has reached a certain level of development, their emissions should begin drop over the long run (Seldon & Song, 1994). Scholars have debated this conceptualization of the relationship between GDP growth and environmental pollution, and there are questions as to whether it is applicable to CO₂ due to its uniqueness as an environmental pollutant (Huang, Lee, &

Wu, 2008; Moutinho, Varum, & Madaleno, 2017). These studies argue that declines in emissions that come from reaching development thresholds may not be permanent, and increases in emissions related to development can begin again later, which would indicate that the relationship between economic development and emissions is best depicted as an N-shaped curve (Moutinho, Varum, & Madaleno, 2017). Rather than looking at a broad metric such as economic growth, other studies indicate that energy consumption has a stronger relation to GHG emissions since evidence shows that an increase of 1% in energy consumption increases GHG emissions by approximately 0.82% (Hamit-Hagggar, 2012). This discussion is important for EA policy makers because it informs the value of future development in leading towards emissions reductions and provides license to increased development should the agreed upon understanding be that it will ultimately lead to lower levels of emissions.

2.4 The Political Considerations of EA

2.4.1 Problem Denial and Blame Avoidance

Any changes to EA legislation in Canada must navigate through the political system, and in doing so will undoubtedly encounter political barriers due to the highly controversial nature of climate change policy. The concept of blame avoidance and problem denial offer an example of the kind of barrier relevant to climate change that manifests as an inherent part of existing political structures (Howlett, 2014; Weaver, 1986). Due to a negativity bias among constituents, meaning that people react more strongly to perceived losses than gains, public office holders will seek to minimize blame for making changes that yield undesirable outcomes (Weaver, 1986; Hood, 2010). Therefore, the degree to which the public will attribute a problem to an intentional government action, or lack thereof, and the intensity of the problem are important factors in determining the likelihood that a politician will use blame avoidance or problem denial strategies (Howlett, 2014; Hood, 2010). Climate change is characterized as a low visibility and high scope problem to which the intentionality of government involvement in the problem and the intensity of public concern is

considered low (Howlett, 2014). Visibility is low because those who are not living on the margins of where changes are occurring do not easily see its impacts, and it is seen by many as a problem beyond the control of government action (Howlett, 2014). Because of this, governments are more inclined towards negative policy strategies of denial or dismissal of the more severe estimations of climate change effects (Howlett, 2014). This is an important framework for considering how the Canadian government may respond to climate change-based reforms to the EA process. According to this framework, it would be reasonable to expect that changes to the EA Act will not deviate significantly from the status quo. If there were to be a significant change to EA, it would be highly visible and highly intentional, and any resulting failure would be easily blamed on the government responsible but retaining the status quo would not expose politicians to the risk of being blamed for immediate policy failures.

2.4.2 The Influence of Industry

It is common knowledge that industry groups lobby politicians to benefit from favorable legislation, and this has taken place in the past with respect to Canadian environmental policy. As an example of this, after sending a letter to Peter Kent, former Minister of the Environment, and Joe Oliver, former Minister of Natural Resources, Canadian energy producer associations seemed to get exactly what they had asked for out of the subsequent CEAA 2012 legislation (Paris, 2013). Between 2008 and 2012, there were more communications between energy associations and designated public office holders than any other industry group or NGO (Cayley-Daoust & Girard, 2012). During this time frame, CAPP and CEPA logged 734 communications with public office holders; in comparison, the largest Environmental NGO, Climate Action Network, had only logged six meetings with public office holders (Cayley-Daoust & Girard, 2012). There is evidence of the significant influence that the energy industry has over politicians, and with respect to EA reform, industry associations may be able to use this influence to shape the EA reform process in their favor.

2.5 Summary

Climate change is an unbounded problem that forces us to consider solutions from many different perspectives. Despite 25 years of EA legislation in Canada, the

current iteration of the Canadian Environmental Assessment Act does not provide adequate guidance or legal support for EA policies that would help address Canada's contributions to climate change, nor do provincial processes. Understanding the requirements and implications of meaningful climate change policies in EA requires a diverse scope of investigation that includes consideration of scientific, economic and political information. Scientific information about climate change provides the basis for appreciating the dire need for improved climate change policies. Economic considerations help to understand competing ideas that may attenuate climate-based EA policies that result from ongoing reform process. Consideration of the current political milieu will give context to the motivations and desired outcomes of politicians as they move towards a comprehensive reform of the EA act in Canada. Bringing together these pieces will be a central part of my research project as I attempt to derive an understanding of what an effective and meaningful climate change approach would look like in Canadian EA.

3.0 Research Design and Methods

In this chapter I explain in greater detail the research design, methods and data analysis procedures that were introduced in chapter 1.

3.1 Approach and Design

I followed a qualitative approach since the purpose of my research was to obtain an understanding of the implications and complexities of meaningful climate change-based EA policy, and this understanding is largely derived from the meaning and value that individuals ascribe to proposed policy solutions and predicted outcomes. A qualitative approach was best suited for this type of purpose since it favors an inductive style that focuses on individual meaning and seeks to draw connections from the complexity of the subject matter (Creswell, 2014). My research had an exploratory component since an EA process with a robust climate change component is something that has yet to be implemented; however, the Federal Government is currently examining such policy. Analyzing the themes and connections of the data gathered through the Federal Expert Panel Review of EA will be an important component of my research and this will be a qualitative process. The approach I followed for my research also considered the possibility of emergent ideas that result as I conduct my procedures and these ideas may influence the direction I follow going forward.

The data required to fulfill my objectives were obtained through document review and through interviews with experts in the field of EA policy, climate change, and economics. These methods are well suited for my objectives because document review and interviews with experts are effective tools for gaining an in-depth understanding of a subject, and an in-depth understanding of climate change-based EA is required to address each of my research objectives. My goal is to gather the requisite data to answer objectives 1 – 2 and to gain a depth of understanding of the data so that the conclusions I draw as part of objective 3 are sufficiently informed. Since the intent of my research was to explore the subject matter, draw conclusions from a holistic analysis of complex subject matter, and to allow for emergent research designs, a qualitative research approach is justified.

3.2 Data Collection Methods

3.2.1 Document Review

I began my data collection with a review of pertinent documents. I found that the document review was an efficient and unobtrusive method that is useful for providing relevant context to the research, identifying interesting questions to be asked of experts during interviews, and for corroborating and comparing multiple forms of evidence, as suggested in the literature (Bowen, 2009). Qualitative document analysis is also an emergent methodology as it allows for findings to dictate the future directions of investigation, and it is also concerned primarily with exploration of available data to identify themes and patterns (Altheide, Coyle, DeVriese, & Schneider, 2010). The purpose of performing a review and analysis of available documentation is to address objectives 1, 2, and 3, but also informed the interviews I conducted.

Documents were obtained from government websites, industry or NGO websites, the database of submissions to the Expert Panel on EA reform, academic libraries, and credible journalistic sources. The types of documents that were reviewed included government publications, academic publications, written submissions and transcripts related to the EA reform process, conference proceedings, and publications from NGO's and industry association. Subject areas covered as part of my document analysis included: climate science, economic considerations of EA policy, political considerations related to EA policy, suggested frameworks for working climate-based EA policy and jurisdictional examples of climate-based EA policy. I categorized documents per their source at the outset to understand whether there are emergent themes coming from a particular group or sector. As themes emerge, I altered the direction of the document review to seek further clarification and understanding. This type of approach to document review focuses on constant discovery and comparison of the relative meanings, situations and nuances communicated by the author (Altheide, Coyle, DeVriese, & Schneider, 2010). As I reviewed each document, I ensured it is appropriately coded so that it can be analyzed in aggregate with the other documents reviewed as part of my research.

As I performed my document review, I used NVivo data analysis software to track the notes I make related to each document. After gathering enough data, I used NVivo to analyze the data as explained in section 3.3.

3.2.2 Interviews

I used a semi-structured interview format since there were recurring questions designed to provide a deeper understanding of EA climate change policy. I also utilized the flexibility of a semi-structured interview so that interviewees can expand into other areas of conversation that they deem relevant, and to allow them to express their opinions on other areas related to the subject matter (Merriam & Tisdell, 2015). Since participants had varying backgrounds and levels of understanding of specific issues, questions were tailored from a bank of possible options based on the expertise of the participant. As an example, political scientists were asked questions about Canadian politics that were not asked of those with strong assessment backgrounds, in fact I was looking for the views of people outside of the EA community.

Interviews were conducted with academics, policy makers, scientists, and economists who have expertise related to the field of EA policy and climate change. Expertise was also drawn from those who are removed from the institutions that support EA but have published academic papers critical of EA as a process. I used the database of submissions to the Expert Panel and my committee as a source for finding a sample of experts in the subject matter. I used a stratified sampling design, whereby distinct groups of individuals are identified (as noted below), and then individuals were selected within each group as participants (Creswell, 2013). Groups that were identified include non-governmental organizations, regulators, EA practitioners, industry, political scientists and environmental academics. I asked selected expert participants if they know of anyone else in their field that may be willing and interested in being interviewed, this is considered snowball sampling (Creswell, 2013). Expertise was defined by academic credentials, years of experience in a position related to EA policy or subject relevant to the discussion of climate-based EA policy, or other experience deemed worthy of inclusion in my sample. In the end I interviewed 18 participants and the interviews ranged in length from 45 minutes to an hour and 20 minutes.

My interview questions as established in Appendix A obtained the perspectives of participants on viable pathways forward for integrating climate change into EA, the challenges that they would expect in implementation, and how to overcome these challenges and any others that I have identified throughout my research. Additional questions were added as new themes emerged. New questions regarding the politics of climate change were added as it became clear that I needed to interview individuals with expertise in the politics of climate change in Canada. As information was gathered from interviews, questions continued to be adapted to reflect new information. The interviews facilitated discussions that explored each participant's understanding of climate change, EA policy, and how the two could come together in a reformed EA process. Semi-structured interviews were used to gather data from experts because they are a useful tool for filling gaps in knowledge and understanding complex motivations (Dunn, 2005). As revealed in the interview schedule Appendix A, a section of the interview is devoted to allowing the participant to explore climate change EA policy from their own perspective and to speculate on what kind of policy they think would be most effective. Subsequent questions then ask them to envision some of the challenges that would need to be overcome to implement effective EA policy. As anticipated, there were conflicts involving economic and climate considerations, as well as political and scientific conflicts among others, that hinder our ability to move forward with climate change-based EA reform.

The interviews were recorded electronically using voice recorder and then transcribed into NVivo for further analysis. All interviews were conducted over the telephone and recorded using a voice recorder. The written transcripts were combined with information obtained from my document review and then analyzed to determine themes and conclusions based on the aggregate of collected information.

3.3 Data Analysis

I used NVivo data analysis software to assist with content analysis so that important inferences could be drawn from my data (Cope, 2005). By performing an analysis of the information obtained, I was able to report on the instances of conflicting

data and viewpoints within the literature reviewed. I also looked for themes that follow the responses of experts and from different disciplinary and occupational backgrounds to see if background has an influence on the way in which they judge the merits of potential climate change considerations in EA. Data were analyzed to determine if there was a recurring convergence of issues related to EA (e.g. a recurrence of carbon budgets referenced in the context of limiting GDP growth).

I used codes to analyze the data because they are an effective means of describing the data in terms of categories and themes and making it easier to see the interconnectedness of the information I obtained (Creswell, 2013). In the first cut, codes were developed around either barriers to climate change consideration in EA or as ways to improve climate change consideration in EA. These were the two main categories of themes that emerged from my literature since it indicated factors that either stood in the way of realizing a meaningful climate change process for EA, or ways that we could work to achieve one. Much of what I read indicated the political and economic considerations have an impact on our ability to produce climate change laws that effectively address the problem of climate change and so those became the main themes of chapter 4. Literature from the submissions to the expert panel on climate change also provided a source for ideas that structured the main themes in chapter 5.

After I coded the data, connections between code families were identified and described to ascertain their significance with respect to my research objectives. The goal of the coding is to identify relevant connections between the data that will help fulfill my research purpose.

As part of objective 3, the analysis of my data included the synthesis of ideas into a framework for understanding how the process of climate change in EA could be improved. The framework sets out the important aspects of a successful process for considering climate change as part of EA. The goal of this analysis was to provide insight into how climate change EA could look as a process that could be implemented on future projects within Canada. As part of this framework, key components of a successful climate change EA process were identified and procedural elements that may not be present at the legislative level but are nonetheless important for a

successful climate change EA process were also included. I designed this framework to be applicable for assessing all projects in the context of climate change in Canada, so therefore it will not be structured around the specific considerations of one type of project.

3.4 Validity

Validity is an important consideration for my research as it is a determination of whether my methods are accurately describing and explaining the themes and relationships as intended by my research (Long & Johnson, 2000). I focused on using triangulation, and advisor debriefing as a means of providing validity to my research results. I also was given permission to record all my interviews, so I had verbatim transcripts as well as my own notes to work with.

Triangulation involved checking the data obtained from one source against other forms of data to mitigate the chance of relying on invalid single source information as I have described above (Long & Johnson, 2000). My interview transcripts were checked back to documentation, and findings from document review were corroborated with documents from different sources or through expert interviews. Transcripts were reviewed multiple times to verify that transcripts matched the audio recordings of participants. There were no instances of confusing language or meaning that required follow up with participants for greater clarity. Advisor debriefing included discussions with my advisor and committee through the research process to ensure that the sorts of data I was obtaining which helped me to approach the objectives posed, or to implement any modifications to help with this.

3.5 Ethics

My research includes participant interviews, so ensured that I followed the appropriate ethics review procedures as outlined by the University of Manitoba Office of Research Ethics and Compliance. I submitted my research plan along with my final

interview questions to the Research Ethics Board before conducting any work with participants. Only after receiving approval did I reach out to participants and conduct interviews. Each participant had the opportunity to refuse answering any of the questions, or to end the interview at any point in time. Participants were able to request to have their answers excluded from the research should they change their mind after having been interviewed.

Participants were provided with an explanation of the intent of my research and the purpose of my interview with them specifically. I asked them to provide consent by requesting that they sign a consent form prior to the interview. The consent form (Appendix B) outlined the intent of my research project and ask for their permission to quote them and to record the interview using a voice recorder. Some participants requested that their email response be sufficient to certify consent and did not wish to have to return the signed consent form. The consent form also explained that transcripts of the interview were to be recorded in Nvivo and used for analysis with other participant interviews and documents. Signed consent forms were kept in a locked cabinet at the Natural Resource Institute.

4.0 Barriers to Effective Climate Change EA

In the subsequent sections of this chapter I discuss the results of my research as they pertain to issues that were highlighted as significant barriers to achieving an effective process for incorporating climate change considerations in EA. I have chosen to present the identified barriers to climate change EA practices prior to my discussion of the data related to best practices because it provides important context for understanding why the subsequently discussed best practices are necessary. The data was primarily obtained through interviews with 18 participants and the results presented are a synthesis of their ideas and perspectives on the issues relating to barriers to effective climate change EA. The main themes used to present the data in this section emerged from consideration of the literature and while reflecting commonly known sources of opposition to climate change action. The sub-themes noted are grounded in the data and emerged through conversations with participants and as part of the discussion. I also look for areas where these themes overlap and are supported by literature.

These main themes provide the framework for the following chapter and the sequence of discussion of each theme was influenced by an understanding obtained through review of my data. In short, that understanding includes the notion that economic considerations strongly influence politics, which then strongly influence the way EA policies emerge and are then implemented. The main themes of economic considerations and political considerations emerged from my literature review while implementation concerns emerged as a result of my discussions with participants. Likewise, most of the sub-themes in political and economic considerations were determined through review of the literature though there were some that emerged through my discussions with participants as outlined in Table 1.

Table 1 - Barriers to Climate Change Considerations in EA	
Main Theme	Sub-Theme
Economic Considerations	Economic Inertia
	Cost of Addressing (or not addressing) Climate Change
	Institutionalized Uncertainty
	International Considerations
	Provincial Variation
Political Considerations	Accountability in Politics
	Electoral System
	Federal/Provincial Government Relations
	Incentives and Policy Development
	Public Understanding and Misleading Information
	Ideology in Relation to Climate Change
Implementation Considerations	Lack of Context for Emissions
	Problems with Assessing Alternatives
	Lack of Clear Decision Criteria
	Independence Issues
	Lack for Proper Forum for Discussing Climate Policy
	Reconciling Federal Climate Policy with Energy Policy Decisions

4.1. Economic Considerations

Data related to this theme reveals how certain beliefs and/or realities about the Canadian and global economy present a significant impediment to achieving effective climate change EA. It is worth stating that the barriers identified here are very likely unsolvable through any proposed changes in EA law in Canada; however, understanding the nature of these issues provides important context for thinking about

what needs to be overcome, what areas to focus future thinking, and how these broader issues may feed into and influence decisions made at the policy level that do have a material impact on the resulting EA regime in Canada. In subsequent sections, I will draw some connections to these questions.

4.1.1 Economic Inertia

In regard to the sub-theme of economic inertia data revolved around how economic considerations may influence climate change-based EA policy, with participants noting that there is indeed a dramatic relationship between certain economic factors and the strength of our policies and laws designed to address climate change. One such factor was that much of Canadian economic productivity is still predicated on continuous expansion of resource development and that economic productivity in general has strong relationship with fossil fuel use. This notion is supported in the literature which indicates there is a unidirectional relationship between GDP and CO2 emissions for developed and developing countries (Mbarek, Saidi, & Amamri, 2018). If politicians perceive climate mitigation efforts as weakening GDP growth, they may act in opposition to those efforts. This logic would reflect the traditionally held notion of climate action as a short-term burden on economic productivity (Stern, 2015).

It's going to be really tough for a government, for example, to put a threshold on fuel combustion, fuel combustion generally because that has about a 90% correlation with economic activity. That's just the way the physics of our civilization work at the moment. It may be quite different in 50 years, but in the interim, everything from plowing to planting every scrap of food that comes into every city is moved by rail or truck. Ships are burning fossil fuels. An ambitious scenario might see personal light vehicle transportation transformed say within 25 years to 50% electric, that would be an ambitious scenario, but it's not changing the heavy haulers which run on diesel. Really when you get down to it, civilization runs on diesel because all the big machinery run on diesel. -(Participant 17)

This participant clearly feels that there are some unignorable realities to balancing economic activity and climate action, and this seems to be because, as discussed more

in section 4.2, our politics have been entirely infused with economic activity and the influences of major economic industries so that no government could reasonably justify slowing down the economy even if it gave us a reasonable chance at preventing a climate catastrophe. At a more specific level, participants mentioned that this impediment has an even more application when considering the economies of Alberta and Saskatchewan. This is due to the entrenchment of oil and gas resource development as a major employer and component of the economy in those provinces. This is reflected when considering data on emissions growth in Canada which shows most of Canada's growth in emissions, and projected future growth, coming for those two provinces (Harrison, 2013). This was also more broadly illustrated by general sentiment among participants that the strength of the oil and gas industry in Canada is significant, and that fossil fuel use by Canadian citizens is something that we are reluctant to curtail in any impactful way.

So you know, there's a lot of, there's a lot of things going on but specific to Canada, we have an extremely fossil fuel intensive economy, so we were one of the countries that needs to change the most and ironically, that makes it especially hard for us to change because we have entrenched fossil fuel interests, and that is also evident about industry and for households. Canadian families are heavily dependent on motor vehicles. We tend to commute in motor vehicles to work or school, relatively long distances. We live in big houses in sprawling cities and industry. We have significant fossil fuel production. We also have a lot of other sectors that are heavily dependent on cheap energy from fossil fuels. So, you know, there's a lot of losses to be had in pursuit of long term gains in the Canadian economy. -(Participant 10)

This participant's comments show us that our inability to react effectively to the climate crisis is in many ways tied to the lifestyle expectations that we have cultivated over the years and was provided to us by our fossil fuel driven, consumer economy. Further to this, the inherent difficulty of moving away from the status quo was mentioned by participants as a challenge. This was in the context of climate change-based EA acting as a possible catalyst that would force a shift in our economy towards a more sustainable model of renewables in opposition to oil and gas production.

I think, though, that you're gonna, you're still gonna get negative reactions in places like Alberta and Saskatchewan because there's always a reluctance to move away from the status quo, and the status quo there is oil and gas development and so there'll sort of be a reluctance to move into something else. Why? Because you know what? If I have my oil and gas job, I know what I've got. I've got some certainty in that regard. If I then go to the green economy and my oil and gas job disappears, I don't really know if I'm gonna be capable of being re-skilled and will I end up with one of those renewable jobs or not. –(Participant 5)

As these quotes show, participants acknowledge that there are considerations pushing us towards maintenance of the economic status quo that would impede our ability to implement meaningful climate change-based EA policy, they also indicate that much of this impediment is self-derived in the sense that we have built and grown our economy and culture in such a way that we are unable to muster the wherewithal to address an existential crisis like climate change.

4.1.2 Costs of addressing (or not addressing) Climate Change

On a more specific level, beyond generalized economic inertia, and using our conversation regarding climate change based EA as proxy for meaningful measures to address climate change, participants spoke about the costs of these measures and also the loss of opportunity or potential future costs of not undertaking more meaningful measures to address our GHG emissions now. The consensus among participant responses was that there would be significant upfront costs to parts of our economy and certain industries, particularly heavy emitting industries; however, five participants went on to then emphasize the potential benefits associated with taking initiative now rather than later. One possible reason that fewer participants spoke about the potential economic benefits could be that literature that frames climate change policies as primarily being an economic cost has been circulated for longer than the more recent articles discussing the potential for economic co-benefits (Stern, 2015). It could also reflect differences in background and attention to this issue. Participants who highlighted the potential for economic benefits came from backgrounds in environmental

academia or NGOs, whereas those who focused more on costs came from an industry or regulator background.

It's a transformation of a key sector of the economy and activities that are spread through most other sectors. Any transformation of that kind is going to be disruptive and difficult. And it's going to be especially disruptive and difficult if we have to do it really fast as it will certainly become once it becomes more disastrous. Unless the climate science is all wrong, which would seem to be denying reality, then you do it now or you do it later when you've got less resources and more panic. So, is it going to be disruptive, inevitably, will it be more disruptive now than later, no, the opposite is the case, the longer you wait the more erratic it will be. The exception to that is, that if you do things now and other countries don't, they will maybe have some advantages in the short run that you don't have. -(Participant 3)

This participant's comments cut to the core of the problem as it pertains to the economic impediments to climate action. The tension and discomfort many feel when considering that to save the planet, we may have to give something up, it will not go away and in all likelihood, it will get worse as time goes on and the costs of inaction increase. As a cost of addressing climate change, participants mentioned that there would inevitably be questions around what to do with workers in heavy emitting industries if production were to stop as a result of new climate change based laws, and they noted that we should be preemptive in planning for that. Participants also mentioned that costs of addressing climate change through new laws are not spread evenly across the country, they are unevenly distributed across provinces and sectors. Workers in Alberta were singled out as a group at risk of potential economic loss from stronger climate change-based laws. This seems to be a reasonable suggestion given that mining, and oil and gas extraction accounted for 27% of Alberta's GDP in 2018 (Alberta Government, 2018)

It's not only the industry that's putting the pressure on the politicians, it's also the people who have jobs in those sectors. If you look at Alberta, you know, uh, that gas industry is an incredibly important employer and uh, there's actually been a very sizable loss of jobs in Alberta in the last 3-4 years as a result of the price of oil going down, you've heard it. And so now you know, you've got this really, uh, strong reaction to any further decline in the oil and gas industry because there's actually been a tremendous loss of jobs already. -(Participant 5)

I guess it's understandable when people's livelihoods are connected to that (heavy emitting industry), so there's a separate set of issues around that in terms of thinking through, you know, what a just transition is to help Alberta move into other sectors and to lessen the blow as there's a shift away from fossil fuels. –(Participant 1)

It was one participant's opinion that the projects that could be lost under a more stringent EA process fund programs with many social benefits. The rationale for the loss being that Canada would not be attractive for investment when compared globally with other regions, so Canada would lose out on the investment for these projects and therefore the funding for the social programs.

The economic implications of doing this (climate-based EA) are all these major projects that one, have the potential to have improved global outcomes and deliver economic benefit to Canadians, you know, each project is billions and billions of dollars of capital investment. You know, if we're losing those projects we're not only losing the initial investment but also the operational benefits that communities are seeing from those projects. – (Participant 14)

Another participant echoed this sentiment to the extent that they did not want to see EA adding unnecessary or burdensome extra costs to the process of project development citing that there's an affordability issue that needs to be considered even if we'd like to do the best we can for the environment.

Yeah, I don't want EA to be saying, well you've done so much but I'd like to understand a little bit better, what you're doing with the three vehicles on site. There's got to be a materiality test at some point. You say you've already moved the world but you still want us to move these three pebbles. I think that's the kind of lens that we would have. No, that's our lens and other people would say, the more the better, if you can do more then do more. I think I would say well, no, because there's an affordability issue as well. –(Participant 18)

In opposition to this line of reasoning, one participant mentioned that failure to develop a system that leads us to a more resilient future economy will have its own set of costs. When asked about the economic costs of climate change-based EA, they highlighted

that knowing the impacts is an important part in moving us in the right direction and that failure to fully comprehend the costs can leave us in a damaged future position.

I mean if the game is that they don't want to know what the impacts are, then there's a big problem with that. And I think the opposite is quite true, like if we want our economy to be resilient in the future, in a world that will fight climate change, if we want it to survive, the economic argument is in favor of really trying to discourage the projects that lead us the wrong way and we'll end up in, and already are, stranded assets. [...] So the economic argument should be how do we build a climate-resilient economy and that requires us to look at all the impacts, it requires us to favor projects that have lower impacts. –(Participant 9)

Other participants also mentioned that disproportion attention has been placed on laws as the source of economic pain for specific industries like oil and gas production when in actuality, the majority of the problem is related to factors outside of law and policy, such as declining oil prices and increases in domestic production in the USA.

From the data gathered, there are conflicting perspectives in terms of how we should structure our thinking regarding the cost of policies that would meaningfully address climate change. There are legitimate concerns regarding how these policies may affect the livelihood and well-being of people employed in heavy emitting industries, but there are also many reasons that these policies can be useful in preventing more drastic costs in the future. This seems to point to a need for more clarity as to how we can transition away from heavy emitting industries in a manner that is fair to those who are most vulnerable now as a result of any changes, but also keeps us firmly on track to meet our emission reduction goals.

4.1.3 Institutionalized Uncertainty

Participants mentioned uncertainty as a byproduct of the Federal EA reform discussion and the potential effect that it can have on investment in infrastructure in Canada. Uncertainty here relates to investors and proponents not having confidence that they can get projects passed through the process, or that the process is at risk of changing with a change in government. In recent years, this line of criticism was frequently repeated in the media in opposition to the potential reforms of the Impact

Assessment Act 2019 (Elliot, 2019). Participants specifically mentioned that a lack of clear regulatory framework has a negative effect on industry because it effects their ability to plan and make future decisions with a reasonable degree of certainty. As a result of this, participants mentioned that Canada can lose out on the foreign investment required to build its infrastructure.

So, it has gotten kind of out of hand and then we see now three times the legislation flipping back and forth so the uncertainty for Canada, and of course Canada simply doesn't have enough money to build its own infrastructure, it all comes from foreign investment in capital. It's all gotten sufficiently unpredictable that were in a bit of a pickle, and even if the major federal impact assessment legislation does stabilize for one more election cycle, it'll be a couple more before anyone actually believes that they know what the federal assessment regime looks like, and so capital of course is fleeing. -(Participant 17)

This participant felt that there has been a tendency for large policy debates to play out within project EA, and that this contributes to the uncertainty of project approvals because these larger policy debates are often unsolvable by any process within an individual project assessment.

I think with the Impact Assessment Act a lot of the concerns and challenges around this, in terms of the climate piece, is the potential for an ongoing climate debate to be embedded in any given project review. So I think that's a concern and, you know, the ramification of that is really just increased uncertainty in timeline for any given project. – (Participant 14)

This argument was brought up when discussing whether climate change considerations should be included in EA, and it is interesting to note that industry and regulators would stop at saying it should not be included because of uncertainty, but not that we should work to make the process more certain in terms of how climate change is considered.

4.1.4 International Considerations

In addition to the discussion of foreign investment, participants also discussed that Canada's oil and gas sector is trade exposed. In the context of EA, this means that any regulations that are deemed too costly or burdensome have the potential to shift

production to more favorable jurisdictions. The discussion did not include judgements of whether Impact Assessment Act 2019 is having this effect, rather that this is a concern when trying to think about the development of climate change approaches to EA.

Yeah, so one of the things that comes along with Alberta having a large oil and gas industry and Saskatchewan as well, um, that a lot of their economy is trade exposed and energy intensive, which means essentially, that it's high in emissions and their products compete with other products globally. Therefore, there is the issue of leakage where you create new costs or environmental regulations for the industry in Alberta, it means production may just shift to other jurisdictions that so you have the double whammy of number one losing economic activity in Alberta, but number two, you don't actually reduce any emissions because they will occur just in another jurisdiction. –(Participant 4)

Another point that was made was how our export dependence puts us in a position of future vulnerability. One participant mentioned that we export 80% of our oil and gas production and that the economies of some provinces are dependent on that. This dependence then creates a situation wherein as time passes, if the countries that import our resources decide to transition to renewables, they can potential force our oil and gas sector out of business.

There's an additional economic argument in that we are especially vulnerable to climate action that may be undertaken by other countries, the countries to which we are currently or expected future to be exporting our oil. And so, even if, I mean basically those other countries can put our oil industry out of business for us. –(Participant 10)

In the context of climate change approaches to EA, this would be an argument in favor of a process that directs us towards a more sustainable future economy that moves concurrently with the international community on climate action.

One participant mentioned that when conducting an EA, from a climate change perspective we should be considering the project from the context of what the alternatives are globally for a similar project. The assumption being that Canada has some of the best technology and we should not deny ourselves the project only to have

a less efficient one take its place. Also, we should consider the potential for less intensive resources to supplant dirtier international sources of energy.

I think, you know, as we look to the new technology and things, if emissions are the key component, like if there's nothing, no other considered impact other than emissions, you know, I think we really need to consider emissions intensity and how does this project compare globally? Because again, a project in Canada could be outperforming globally, but by the nature of the project it's going to increase domestic emissions. –(Participant 14)

Other participants debated whether this sort of international consideration was value adding, noting several possible questions that would undermine the premise of international consideration within EA of this sort.

There's been lots of comment from industry supporters saying "well, our ethical oil.." - questionable claim - "is going to supplant other oil from other places that are worse," - and I think that argument is at best a stretch, almost in any application. Secondly, there are arguments about natural gas, Canadian Natural Gas supplanting coal-based electricity generation someplace beyond Canada and that is more plausible but also less guaranteed. Is it really supplanting coal? And is it supplanting coal in a way that'll make it harder for a transition to Renewables? – (Participant 3)

4.1.5 Provincial Variation

Returning to domestic considerations, four participants noted that the differences among provinces in Canada in terms of their energy sources, economies and lifestyles mean that climate policies will have a disparate effect depending on the province. Some provinces, such as Alberta and Saskatchewan, will struggle more with climate change mitigation laws, but are also emitting significantly more than other provinces in Canada. The following quotes reveal just how wide the chasm is in terms of emissions among provinces in Canada.

So, if you look at Canada as a whole, its average emissions are quite high compared to other high-income countries that we usually compare ourselves to, but if you look, say, at the province of Quebec, it's per

capita emissions are similar to the European average, much lower than the Canadian average. If you look at Alberta and Saskatchewan, their emissions are, if they were countries, they would be right at the top of the world, like, they're above the emissions of Qatar and all the other Middle East and Gulf States.–(Participant 1)

Canada has tremendous regional diversity in terms of the fossil fuel intensity, our economies, and in fact, differences among Canadian province are greater than the differences among any countries in the world in terms of per capita greenhouse gas emissions.. –(Participant 10)

Understanding these differences also helps to understand why opposition to climate change is more prominent in Alberta and Saskatchewan. One participant made the point of mentioning that the provinces least likely to support climate policies are the ones with the highest emissions per capita.

...there's some good data from the University of Montreal which looks at different questions about whether people think climate change is happening, their views on policy, and whether they think it's going to affect them and it's quite interesting given the regional distribution and you can see it maps very closely to, you know, Alberta and Saskatchewan are the least supportive of action and other places are more supportive, but also, you know, wide agreement that it's happening but less of an agreement that it'll affect people personally. – (Participant 1)

This underscores how climate policy in Canada is challenged by stark regional differences in opinion that played out clearly during discussions leading up to the passing of the IAA 2019. As a supporting example, the current Alberta premier frequently referred to the IAA 2019 as the “no pipelines bill”. There seems to be a relationship between opinions that are less supportive of climate change policy and provinces that have high emissions intensity, which is problematic because if Canada is looking to reduce emissions in order to meet our reduction targets, buy-in from high emitting provinces will certainly be important for achieving these targets.

4.2 Political Considerations

Political considerations were identified as a possible theme prior to collecting my data, but as I spoke with participants about barriers to an effective climate change approach for EA, it became clear that this was a significant issue for them as well. As such, I included 4 participants with a background in political science in my study in order to obtain perspectives from people who have expertise in the field. As with economic considerations, many of the barriers discussed transcend any reasonable solution that could come from an improved EA process, but nonetheless, it is important to understand how these barriers may influence any framework for inclusion of climate change in EA that I attempted to develop.

4.2.1 Accountability in Politics

This subsection presents the data that relates to issues of accountability that are built into our electoral system. It was frequently mentioned by participants that there is an incongruence between the nature of laws designed to help address climate change and our election cycle. Laws designed to address climate change are seen as something that requires a long-term perspective to fully appreciate their value, whereas politicians are accountable to what they have done within a 4-year election cycle. The quotes below reveal how the incentive of re-election and risk aversion act in opposition to the bold actions we need to address a major, long-term crisis like climate change.

We always tell politicians they have to be more courageous and long term in their thinking and do strategic planning and govern with foresight and all of those good slogans. [...] And it's exceedingly difficult to do because of the constraints imposed by the need to get re-elected. And politicians are risk averse, there are risks involved in trying things in an experimental way, on climate change or in any other policy field. – (Participant 15)

Exactly, because they're (climate change goals) often long-term and governments last for 4 years so they're always pushing the puck to the next government, and this just happened in Quebec, we just have a new government now and our targets for 2020 are not going to be met, but the new governments like, "well, the last government didn't do anything and now we can't meet them, it's impossible, so we're just going to disregard them."-(Participant 9)

Participants mentioned environmental commissioners or a legislated climate accountability body with real power to hold politicians accountable to their long-term climate goals as possible solutions to this problem. Canada currently has a Commissioner of the Environment and Sustainable Development who reports to the Audit General of Canada. The commissioner reports on the federal governments sustainable development strategy and audits the information provided by the federal government, but they are limited to their reporting and there is no mechanism for them to compel action in law or by politicians – only moral suasion.

Another point that was brought up by participants was that politicians tend to view themselves as accountable to economic performance measures more so than the environment. This also seems to play out in the public discourse as economic changes and economic performance often overshadows discussion of the environment.

Well, I think the thing that gets in the way the most is our political system. You know, politicians see themselves as being mostly responsible for managing the economy. There's a whole bunch of things that they do with regards to health regulations in various other regulations, but if you look now, we're at the beginning of an election cycle, and when you look now at what everybody's talking about oh, they're talking about all the economic changes they're making. I haven't heard much talk about climate change. It's the biggest threat we face and they're silent on it. –(Participant 12)

While this may be true historically, it's worth noting that post Canada's 2019 election, it is a commonly held opinion that climate change was one of the leading issues of importance in the election, which does show a growing understanding of the severity of this issue. However, the general point that economic issues often overshadow climate change in importance is not invalidated by this, especially considering the Federal Government approved a huge LNG project after the 2019 federal election. It can play out in other ways, not just in terms of what's discussed prior to elections. One Participant mentioned that it tends to manifest as deference to big industries who get privileged access because they speak for large sectors of the

economy and large employers of Canadians. They highlighted the example of SNC Lavalin and what it can tell us about the access that industry has to our politicians.

...one of many fascinating things about the SNC Lavalin scandal is what it revealed about how influential big companies still are at the very highest levels of politics, of Canadian politics. The access that that company had, I mean its not an oil and gas company but just as a large company, what kind of access they had to the prime minister, the prime minister's closest advisors and how much they were willing to do to try accommodating the interest of that company. I mean, I cannot imagine, it's laughable to try and think of a similar scandal with Green Peace access in the corridors of power in Canada. –(Participant 10)

This ties in to points made earlier regarding how infused large economic interests have become with our political system and our political philosophies. Big industry access within the halls of power has become a norm in the Canadian political landscape. In general, participants acknowledged that there are barriers related to how we hold our politicians accountable and to whom they view themselves as primarily accountable. Participants spoke of this on many occasions while discussing barriers to establishing effective climate change EA practices.

4.2.2 Electoral System

Another barrier that was raised by participants was our electoral system. This barrier is beyond the capacity of any solution from with EA but understanding the role it plays in our inability to address climate change through strong laws and regulations, in the minds of some, is nonetheless relevant to the discussion here. As reveal in the quotes below, participants with a background in political science mentioned that our electoral system presents challenges with respect to climate change issues, so although EA cannot solve this problem, the theme was very prevalent among those with expertise related to political issues. Specific issues mentioned were the limitations of first past the post for yielding coalition governments with a significant Green party component, as well as increasing partisanship leading to polarization on issues like climate change.

I think the other thing I would add is that we have an electoral system, which is based on first past the post in individual ridings, has meant that we haven't had a significant Green party presence. And we haven't had, uh, coalition government where in some countries the biggest leaps forward in climate policy have been made during periods when the Green Party is in a coalition government. –(Participant 10)

...The partisan divide that exists in Canada, you know, political life in Canada, in our parliamentary system, is organized into teams, I think you could think of it in a sports analogy the way that the competition that goes on in political life is between organized teams of players, they almost should enter the arena of politics with uniforms on with their team name and logos on because competitive discipline political parties are the way parliament's get organized, it's the way people get recruited into Political life. –(Participant 15)

4.2.3 Federal and Provincial Governmental Relations

A significant barrier mentioned by all participants with political science expertise, but also by many other participants from other backgrounds, was the relationship between the Federal Government and the Provinces in terms of their jurisdictional powers relevant to climate change. Participants mentioned the inherent conflict between the Federal Governments jurisdiction over environmental issues and the Provinces jurisdiction over resource development within their province. Resource development inevitably creates significant environmental effects so within that space the conflict emerges in determining what the Federal Government is lawfully allowable to do in managing those effects. Opponents of federal intervention make the case that attempts to address these effects are examples of federal overreach on provincial rights to develop their resources. The following quotes highlight the challenges presented by our federalist political system as they pertain to resource development.

The other factor on top of that, in addition to the regional differences and the economic natural resource differences is that our political system is a very decentralized Federation and in fact, provinces actually do retain control over their natural resources and so they do have a big role to play. It's not just a simple as the federal government snapping fingers or passing legislation and saying, OK, we're gonna address all aspects of climate change.–(Participant 4)

The Provinces are very keen on holding on to their powers and not seeing the federal government intervene and ways that erode provincial powers and, so that's sort of key background and the federal government does have the right to regulate environmental matters and to regulate matters of pollution but the provinces have the right to develop their natural resources and they, so in the case of particularly Alberta, they don't want to see any federal measures that would impinge on their ability to develop the oil sands as a province would like to do. –(Participant 1)

Further to this, the longstanding notion of “western alienation” was mentioned in the context of this conflict having played out for many decades within Canada. One participant mentioned that this tension between the Federal Government and Alberta has developed into a narrative that presupposes opposition to any environmental regulation. This then has the effect of bolstering political parties that stand in opposition to attempts to mitigate climate change through changes to federal law.

In Alberta, it's a long story of Western Canadians being exploited, ripped off, or just ignored by the political and economic powers in central Canada, and there's some real truth to that historically, but it leads to this narrative today where any kind of attempts to regulate environmental policy in a way that impacts the ambitions, particularly of Alberta, to develop its energy resources, you know, it gets very closely caught up in that and so, western alienation and resistance to any kind of central control. –(Participant 1)

4.2.4 Incentives and Policy Development

Participants also spoke about how the inherent qualities of the climate change problem create incentives or disincentives for politicians in terms of the policies they choose to pursue. Some responses also help to explain the incentives that lead politicians to pursue policies that are often much different than the advice and guidance they receive from experts on a particular topic.

When discussing barriers to climate change-based laws in EA, participants mentioned that climate change presents a unique challenge for politicians due to its nature. Politicians are often incentivized to pursue policies that can yield an immediate

and upfront, easily recognizable benefit for their constituents, but climate change policies do not typically fit that description. The benefits of climate policies are longer term, they represent the avoidance of future harm and they are diffuse across the entire globe. All of these qualities are not inherently attractive for politicians whose objectives are primarily short term and local in nature.

Climate change is obviously one that's very difficult to address... you know, we're required sort of investment in costs now and of course, we don't necessarily see the benefits until later, and you don't necessarily even see the benefits at all in the sense that they were avoided costs, right. [...] But the other thing is, you have to keep in mind that it's not just that benefits and costs are unequally distributed over time, but they're also unequally distributed over space, and by that I mean different people. And so, you know, the benefits of climate change policies tend to be spread fairly broadly, so you can't control really true benefits from climate change policy.... –(Participant 4)

One participant I spoke with talked specifically about the concept of political symbolism with respect to climate change, noting that politicians are interested in the announcement or the press release, but then things fall apart during implementation when the issue leaves the spotlight because it is the event or the imagery that mobilizes voters.

One of them is called the symbolic uses of politics, and the main message of all his work is that politicians have been quite adept at manipulating symbols. And when you have a disinterested public and they're not attached to political parties anymore, so they don't take their cues from that, they can be moved, they can be aroused or and mobilized, perhaps, by very short term events and very vivid images and emotional appeals and so on, be and they don't go beyond that in terms of looking for more in depth knowledge about what's at stake. – (Participant 15)

In developing policies to address climate change politicians enlist the advice of experts and one of the questions that emerged during my interviews was to ask why it is that often the expert advice is not significantly reflected in resulting laws, as was the case for the recent EA reform process with respect to climate change recommendations.

Participants with a background in political science noted the difference between good policy from an expert perspective and good policy from a political perspective. Good policy from a political perspective has not been salable to a broader public.

My point is this, I guess, that often you listen to the experts in the field and they have, um, they're in depth professional knowledge, but it's kind of blinkered knowledge in a way, they think within the parameters of their discipline...[...]...So you get a group of people together and they're all serious and they're right minded, they want to do the right thing and they want to think longer term on the issues, but what may be missing, and what I've tried to add when I've written reports is the element of including political feasibility. –(Participant 15)

This participant emphasized that there are several administrative and political questions, discussed above as “political feasibility”, that can provide insight as to how technical solutions coming from experts in their field can end up as watered-down version of the original recommendation. The essential point is that when developing solutions to a problem like climate change, one which is highly technical and scientific in nature, it still must go through the considerations of political feasibility and many of those considerations are limited by factors such as public support and administrative capacity. Another participant echoed this sentiment in the following quote.

So what we mean when we say good policy and a lot of times, you know, people who are experts in the field will think about sort of good from a technical standpoint that, you know, it includes the best empirical evidence and models from economics or includes the best environmental monitoring standard based on the best environmental science. So, a lot of people to find good policy narrowly in that context, but when you're a political scientist, you also include the acceptability, the political acceptability or the democratic legitimacy of a policy as well when you think about good policy. So, it must be technically efficient, but it also has to be broadly, politically acceptable... –(Participant 4)

This also relates to the previous discussion of political accountability. Politicians are incentivized to think in terms of who they are primarily accountable to and therefore policies will reflect that reality. As discussed, climate change solutions benefit groups outside of the scope of political accountability in Canada, so the incentives are not as

strong to push policies that would be outside the limitations of political feasibility. This is an unfortunate consequence of not enough urgency among the voting public with respect to climate change, and not understanding enough of the problem to identify and support policies based on the advice of experts.

4.2.5 Public Understanding and Misleading Information

If we are to understand what is politically feasible in Canada, we must understand how the voting public weighs the significance of an issue. In the context of EA reform, the more the public understands the urgency of the climate problem and the solutions that a climate change-based lens for EA can provide, the more likely it is to pass considerations of political feasibility. When discussing barriers to climate change reforms in EA, participants mentioned a general lack of public understanding, such as that described above. Discussion of this was followed by a question asking participants about the influence of misinformation. In this regard most participants acknowledged that it has had a role in shaping public perception of climate change and climate change laws such as Bill C-69.

On the other hand, considered broadly, there has to be public understanding and a basis for informed judgment of what party or policy to support, and so often that happens through some sort of political debate. We need much more public understanding of what climate change entails and what's the positive and negative elements of the important transition are and so forth. There's very little sign that there's much public understanding of that. –(Participant 3)

This participant highlights the lack of public understanding of what climate change entails and that this lack of understanding then effects their judgement of who to support. Another participant mentioned this lack of understanding but attributed it to the inherent complexity of understanding climate change noting it in the context of trying to build the kind of understanding and support for laws that would seek to address climate change.

Climate information is by far the most complicated scientific endeavor of the history of humanity so it's really hard to grasp, even I totally struggle trying to understand, especially the modeling, like it's very, very

*complicated stuff. So there is a communication challenge there. –
(Participant 9)*

Another interesting point mentioned by a participant was that there are incentives for people to avoid understanding climate change and to avoid understanding how we might be able to solve it through proposed legislative changes.

*I think there's also, there's a challenge in Al Gore's inconvenient truth, he makes a statement about how it's very hard to get someone to understand something when their salary is dependent on them not understanding it and so, I think it is tougher to get people to accept the implications of the science, when science is basically saying that we need to scale back fossil fuel-burning fairly rapidly, and so that's, that's a hard one for a lot of people in Alberta to come to terms with. –
(Participant 1)*

The link drawn here by this participant is that understanding climate change can create some uncomfortable realizations for people and that would push them towards perspectives that tell them the status quo is acceptable. This was further echoed by another participant who referenced messaging that has told the public we can maintain our current lifestyles and address climate change without having to sacrifice, which participant believes to be farcical.

... the rhetorical argument that one hears all the time, including from the prime minister, that we don't have to choose between jobs and the economy is actually used as a smoke screen to continue to expand jobs in the fossil fuel industry. You think about the context in which we have heard Justin Trudeau saying Canadians understand that we don't have to choose between the environment and the economy, and it is generally being used when he is approving a pipeline, buying a pipeline, defending approval of LNG facilities and so on.[.... I think we do have to choose. We have really difficult and fundamental choices that Canada needs to be making right now between jobs and the environment, and we need to stop pretending that there aren't trade offs because we are creating the wrong kind of jobs. –(Participant 10)

What can be ascertained from the responses gathered from participants on this issue is that public understanding and messaging around climate change, and the solutions to address it, has been insufficient and misleading in many ways. One participant added

specificity in noting that public understanding of the function of EA has also been inadequate and this has led to apathy when it comes to support for EA reform.

I think a lot of individuals don't understand that, yes, a mine can literally be built in their backyard or nuclear waste put there and if there weren't an EA there wouldn't be a process for feedback. And yes you can always write to your elected Member of Parliament or your municipal government but there isn't a mechanism to hear those complaints or concerns unless you have an EA and that's not general knowledge so I think people think, especially in today's era of red tape reduction, I think people think "oh it's just another bureaucratic hurdle" and they don't understand the importance of or the need for EAs. –(Participant 11)

In thinking about how these issues have developed, participants cited that misinformation has been a contributor. Specifically, the actions taken by oil and gas interests to suppress climate change information and to mislead the public were mentioned on more than one occasion during my conversations.

Massive misinformation. Bill C-69, everything we've heard about it since the fall in the media, most of it is just absolute crap. It's misinformation from the oil and gas industry, from a group called suits and boots as well. It's very hard to counter that misinformation. The environmentalists have been trying to write op-eds in response to the garbage that's being put out and they don't get published, so it's very one-sided. And it's not surprising, most of the big Canadian fortunes, most of the big Canadian banks, most of the big everything are still very invested in this resource, so it's no surprise. –(Participant 9)

We're all to blame. Some people have more blame, you know, the oil industry that funded a campaign of misinformation and obstruction of even minimally ambitious climate policies, you know, deserves a lot of blame. –(Participant 10)

The link between media access and economic power was drawn by participant 10 in the quote above, and this serves as another example how large industries can advance their agenda through influencing the public on matters related to climate.

Other interesting points made by participants include the link between public concern for the environment during times of economic strength or weakness. One

participant noted that when people feel like they are struggling to get by financially, concern for environmental matters tends to decline.

The other thing, too, is looking at it more from a just priority or agenda standpoint, you know, issues like you said, issues like health care, issues like the economy, issues like, you know, whether it's a natural disaster or whatever, tend to take governments attention so climate change and environmental issues tend to peak in terms of government and public attention when everything else is going fairly well and then it tends to dip when other issues like sort of main issues like health care and the economy, those types of things, are going poorly, and we felt that with 2008. –(Participant 4)

This suggests that the best chance for making advances in climate change-based EA would be at times when the public feels like higher priority issues, like the economy, are fine; however, this seems to misunderstand the urgency of the climate problem because short term economic pain is weighted more heavily than the potential for long term civilization altering consequences. Further to this line of reasoning, another participant mentioned the same relationship but then highlighted the contradiction by pointing out that economic activity is responsible for environmental damage.

Yeah that's the interesting thing, if you can get the economy right you have a lot more support for the environmental stuff, it's bizarre. At the same time, the economy is causing environmental damage so figure that one out. –(Participant 5)

4.2.6 Ideological Differences and Climate Change

It was not uncommon for participants with backgrounds in NGOs/environmental activism or political science to mention that the politics of the Conservative Party of Canada was itself a barrier to achieving an effect climate change approach within EA. The Conservative Party was referenced as representing the interests of the oil and gas industry in Canada and some members were singled out as sources of misinformation on climate change.

Well, I think what's evident from the debate on Bill c-69, the great political furor about this, the bet, I suppose, by the conservatives that they can stir up opposition to other parties through stirring up opposition to action on climate change. That certainly does suggest a judgment on

their part, perhaps based on polling data, that there is profound public misunderstanding or unwillingness to face the issues. –(Participant 3)

What happens, you know, I'm not speaking as a partisan but in terms of what, in terms of climate policy a conservative government is going to be very bad for Canada's action on climate change. I just have no question about that. [...] This election is about holding an inadequate line so that things don't get worse rather than, you know, I mean there's been some good stuff in the Pan-Canadian Framework, for sure, its just not enough. –(Participant 10)

Another participant spoke of how ideological differences about the role of government influence how we approach a solution to climate change. Participant 5 noted that there are those who are philosophically opposed to increased government intervention in society, and since strategies for addressing climate change are often seen as the responsibility of government, one such example being consideration of climate change within federal EA, this ideological belief about the role of government obstructs progress on climate change initiatives within government.

When we talk about climate change...[...]... a lot of cases you'll find that you have people who are not climate change deniers, and yet they're opposed to climate change. It's an interesting thing. What it is, what they don't like about climate change is the fact that you're going to require major mitigation in order to deal with the greenhouse gas emission issue and major mitigation requires major government intervention and they are fundamentally opposed to government intervention. [...]. That's a significant barrier, it is the reluctance to allow for significant government involvement in the area of mitigating emissions. –(Participant 5).

4.3 Implementation Considerations

In addition to the barriers mentioned above, which are broad in scope and speak to macro issues that have a material effect on support for considerations of climate change within EA, participants also identified more specific issues related to the implementation of EA that would affect climate change. These issues are critiques of EA as it currently operates, and they identify areas for improvement necessary to ensure climate change considerations can be implemented in EA.

4.3.1 Lack of Context for Emissions

Participants with a background as EA practitioners mentioned a specific issue related to the lack of usefulness of emissions figures in the EA context. Their concern was that in the absence of any meaningful standard of comparison, emissions figures for projects have no value. The following quote tells the story of one participant's frustration with the lack of guidance as to how to interpret the emissions figures in projects under assessment and how those emissions figures should impact the assessment.

So, Environment Canada came out with that document, various forms of guidance, at least those that currently exist don't move the ball forward much. Certainly the agency is currently attempting to formulate improved guidance on this matter, and we have yet to see you know what that means. But what I as a practitioner have no choice at the moment to do, lacking any other form of guidance, any meaningful thresholds, pretty much anything other than counting up the numbers and saying "Here they are." It's furthermore utterly preposterous to quote out of hand, the thresholds, in terms of global CO₂, in any shape or form, would be of any value in the regulatory EA for a specific project. There's absolutely nothing I can do with that, absolutely nothing except mention that as an aside. What is the worth of that? If I put forward evidence and information and if I will admit well, many things that float out there and come from various forms of literature in terms of global version thresholds, that that's fine, I've done my job, I've provided some interesting information, but there's absolutely nothing I can do with that. The reason I can do nothing with it, is because what do we do with that information? What will I do with those numbers when it comes to my specific project? I would challenge anyone to answer the question. I would believe, that at the moment the answer is "you're right, we have absolutely no idea what to do with them". –(Participant 6).

This participant's perspective highlights their perceived problem with the way data is understood within EA. In this context, the data is only valuable if it can tell us something useful about a project's contribution to Canada's GHG emissions, but depending on which point of reference used, the contribution can be made to look small or large. Participant 12 mentioned this issue when describing how GHG data can be minimized while at the same time economic data is exaggerated.

One of the things that proponents do, and there's a new paper that just came out in IAIA by Chris Joseph, and Chris sent me a copy I could pass on to you, but what he was writing on is the strategy that environmental assessors use with proponents, is one of minimization. So they'll look at an effect and they'll try to minimize it by comparing it to something larger and say "Well this is really small so it doesn't matter", and on the other side of that coin, what they do when they're doing EA is they don't minimize any of the economic benefits of the project, they just talk them up as if they're all huge. –(Participant 12).

These comments suggest that one barrier to meaningfully considering climate change within EA would be the lack of a consistent context through which to understand the emissions figures of a project and lack of understanding as to what to do with that information.

4.3.2 Problems with Assessing Alternatives

Participants mentioned that alternative assessments have long been a part of good EA process, but that there are problems in terms of the way alternatives are proposed and considered. Specifically, it has fallen on proponents to perform the alternatives assessment, but this has often led to a very narrow consideration of alternatives since proponents typically only have knowledge and expertise in their particular industry and lack the requisite expertise to do a robust assessment of alternatives. In addition, they are incentivized to push for the project that they are proposing above any alternative.

The alternatives to is very perplexing because what it basically asks the proponents to do is if you're in the business, if you want to proposed a project which does a certain thing, we would like you to think of and consider projects which you have absolutely no knowledge of, no experience in and do, by some arguments, an equivalent fulsome assessment on what that all means. What do you do with this picture? – (Participant 6)

This picture becomes further complicated with a climate focus as consideration of alternatives will need to include an analysis of climate impacts of each alternative. Some felt this could present a barrier in terms of figuring out the appropriate party responsible for performing a robust alternative assessment that includes an analysis of the climate factors.

4.3.3 Lack of Clear Decision Criteria

Participants mentioned that the lack of clear decision criteria for ministerial approval of a project presents a problem for effective consideration of climate change in EA. For example, section 63e of the Impact Assessment Act says that the minister must consider whether a project hinders or contributes to Canada's ability to meet its climate change obligations, but there is no guidance as to the criteria against which this determination is made or how project level information should influence this decision. Participants spoke of the lack of discussion of how information will be evaluated when determining whether a project hinders or contributes to our climate change obligations.

What has been in the Impact Assessment Act in Bill c-69 is in section 22.1 and section 63, in particular section 63e, a requirement for decision-makers to consider the extent to which the project in question hinders or contributes to Canada meeting its climate commitments, so what we've suggested is, what does it mean to do that? How do you figure out whether a project is going to hinder or contribute, and that turns out to be a variety of steps and also a variety of different tools that will be more or less useful for making the determination...[...]... When you're trying to make the other step, which is how much influence these emissions will have on hindering or contributing, there's a virtual silence. –(Participant 3)

This participant spoke in context of how there is much debate over what emissions should be considered and attributed to a project as part of an assessment, but there is very little discussion of the connection between emissions information and how that will affect final project decisions. Another participant highlighted the problem presented by a lack of clear criteria for applying climate change information to decision making. In the absence of any clear criteria for decision making, the minister can superficially consider climate information when determining whether a project hinders or contributes to our climate goals.

Of course we would have preferred something that left less discretion, we would have preferred a climate factor that would actually require substantive compliance with the Paris agreement and our targets and all that stuff but that's not what we have, we just have the consideration of them. So it is still possible that a project that harms our climate

change commitments goes forward with the government saying “ ah don't worry, we'll compensate somewhere else in the economy”, without there necessarily being a robust process for ensuring that we do compensate somewhere else. –(Participant 9)

4.3.4 Independence issues

Another barrier mentioned by participants was related to the accountability structure of EAs. For example, two participants spoke about how in their opinion, EA practitioners are hired and paid by the proponent and therefore have an implicit bias towards reporting favorably to a client's agenda.

What we have is an environmental assessment process based on what's called self-assessment, and the new act and even the current flavor of environmental assessment under CEAA 2012, kind of moves as a little bit away from that but is still fundamentally the same. The first science brought to the table an environmental assessment, and sometimes the only science brought to the table, is generated by consultants working for the proponent, and if the proponent holds the pen, because the proponent is the client, then we will see only stuff the proponent is willing to divulge and you can bet that lawyers control that process way more than scientifically minded people do. –(Participant 16).

Further to this, another participant mentioned that a barrier to effective consideration of climate change is that the process is proponent managed and their motivation is getting projects approved, which has acted in conflict with the objective of protecting the environment.

With regard to climate change, when we're talking about EA, we're talking about a process that's managed by, that has been managed by, proponents who want to get projects approved and I don't want climate change, and what we do with climate change, to rest on the outcome of that kind of process, historically it's been bogus. –(Participant 12)

4.3.5 Lack of Proper Forum for Discussing Climate Policy

A barrier that participants mentioned frequently, and often tangentially, was the issue of project EA acting as a sounding board for policy issues that are much bigger than the scope of consideration of the project itself. In the past, big projects have become spaces for conflict over questions such as, should Canada continue to build pipelines or produce fossil fuels? Proponents recognized that questions such as this are beyond the scope of project assessment and they can often create a barrier to an effective process for considering climate change as discussion and consultations breakdown over ideological divides. The following participant responses provide necessary context for understanding how the large, divisive issues that have found their way into project level discussions, can negatively influence the outcomes of the EA process.

So all that to say that public hearings for infrastructure projects have become federal focus groups where the politics of global climate concern, climate management, national greenhouse gas emissions, are debated in addition to things that a public hearing for infrastructure are actually good at, such as identifying design shortfalls, hearing how affected parties can be protected better, and the evidence for the need for the project in terms of economics and markets. –(Participant 17)

I think with the impact Assessment Act a lot of the concerns and challenges around this, in terms of the climate piece, is the potential for an ongoing climate debate to be embedded in any given project review. –(Participant 14)

My fear is that by attempting to resolve and the big question, by kind of piling it on the Impact Assessment Act, you could potentially destroy impact assessment and environmental assessment, and yet it is a very important tool. It is a very important process for, um, and remembering the original purpose, which somehow we lost in 2012, the original purpose of CEAA was to improve decision making to ensure that our decisions are well informed. –(Participant 8)

The concern here is that EA processes can become the space for discussion of problems that are bigger than the scope of one particular project, and these debates detract from the ability of EA to do what it is designed to do. Without a proper forum for these larger discussions, or clear direction in law, regulations and guidance, the ability

of EA to find meaningful solutions to project specific problems is compromised by the amount of time spent debating issues larger than the project itself.

4.3.6 Reconciling Federal Climate Policy with Energy Policy Decisions

It was common for participants, when discussing topics such as strategic assessment or our international climate commitments, to segue into a conversation that seemed much broader than the specifics of the subject. Since interviews were semi-structured, I followed the discussion and found that there was a shared sentiment among participants that the Federal Government needs to be clearer in terms of how it plans to reconcile its specific policies and actions to address climate change with energy policy and our climate change commitments. The absence of a plan in this regard has been fundamental to many of the problems that have hindered climate change considerations in EA. This has resulted in energy policy disputes playing out within project assessments (as noted in the previous section) and has left many questions to be answered with respect to how climate change considerations of major energy projects will be weighted in decision making. The quote below is from a participant who is of the opinion that this absence of direction and the hypocrisy that results from it is a problem that is effecting EA.

Federal energy policy has played out in project assessment hearings and there's pros and cons in that. I think the pros are that you have a project catalyzing interest, strongly for or strongly against in the case of, particularly crude oil pipelines in the last 10 years, but what you don't have is thoughtful clarity and signaling from the federal government on whether Canada really wants infrastructure, wants to invest in infrastructure for fossil fuel...[...]. I mean, it's a global plus national plus regional, technical and environmental, economic maelstrom all rolled up into one, so all that to say that EA is a lousy place to test your energy policy, and it's mainly because governments don't have the guts to be honest about their priorities. They really, ever since greenhouse gas emissions as a tool to manage climate change became mainstream, starting about 1990 Canada, I think, endorsed the Kyoto Accord, governments have been hypocritical about it, so we're just kind of seeing some of those consequences play out. –(Participant 17)

Participants highlighted that this issue is most obvious when reflecting on the intense debate and argument that has accompanied proposed oil and gas infrastructure projects in Canada. More than one participant mentioned that at the core of the problem, there's a question that has no policy answer at the highest level, the questions being, does Canada want to continue producing fossil fuels? The following sequence of quotes tell the story of how this contradiction between energy and climate policy plays out on the ground when it comes to EA, and why this unresolved issue serves a substantial barrier towards making meaningful steps forward on addressing climate change.

You have to have the policy. So the big decision in terms of, that's being debated politically right now of, how would you put it, should Canada's contribution be viewed from a global perspective or domestic perspective and the real question there is, should Canada continue to produce fossil fuels or not?...[...]... And you can't use impact assessment as an end run on not resolving that question. Right. Which is what some people would like to do. They kind of argue, well, if you did the impact assessment right, and if you assume that Canada is going to achieve the Paris targets, therefore you shouldn't build pipelines. Well, if the government and society as a whole has decided that yes, we are going to build pipelines, we're going to continue to produce oil and gas. You can't say yeah, but we're going to use impact assessment, but you know what I mean? –(Participant 8)

Right now the view is that we don't want oil and gas projects based on party. Why are we having the question? You shouldn't even have it. And so how do you get beyond that point? Um, we're in a transitional period that's going to roll out for a few decades and there's many reasons for that transition to happen, many which many people are not even talking about, strangely. But obviously the one that's dominating that argument is climate change, understandable. So, during this transitional period, what do we do with those from some point of view, annoying, nasty, uh, oil and gas projects. What do we do with them? They're not illegal, so they have to be given a procedurally fair chance. –(Participant 6).

Yeah, I think that's a good point, like, all of the protests over the pipelines, I'm not certain if all of protests, like with TMX, are really about the pipeline or more about, there's just a lot of people that do not want that oil out of the ground and by approving the pipeline you're approving oil extraction. So it seems like there's a gap in our countries, there's no policy exactly on what we're going to do to contribute managing climate change. So, you know, they can use as leverage new

projects that are going through an impact assessment or environmental assessment because those are the projects that gain headlines. – (Participant 13)

The quotes above highlight that climate change considerations in EA essentially force clarity on our energy and resources future, but without any meaningful indication from the Federal Government as to what their intentions are in this regard. So, in absence of any direction from Federal Government, national energy policy decisions are left to play out in an EA process that has not been designed to address questions of that scope and caliber. Further to that, without any meaningful guidance as to Canada's plan for reconciling how climate change considerations in EA align with our energy policy goals, we end up with inconsistent and contradictory results that seem to be in direct opposition to our climate change commitments. One such example being the Teck Frontier Oil Sands expansion that recently received a positive recommendation from the joint federal/provincial review panel despite concluding that it would have significant adverse effects and hinder our ability to meet our climate change commitments (Riley, 2019).

Participants mentioned that it would be ideal if the Federal Government could be transparent about how their plans and policies will achieve our climate change goals, and the steps required to reach them. Within their plan, understanding how climate change considerations in EA are part of the broader strategy will help provide clarity as to what the actual purpose of the process is, and how it contributes to our overall strategy for meeting our climate change objectives. The following participants expressed that we need more guidance as to the mechanism through which we will achieve our Paris goals and some of the possible components of a plan that would take us there.

I think Canada needs to have a variety of mechanisms by which it pushes the kind of transition that you need. So you need carbon pricing, you need a plan for transformation, associated programs for transitioning people who are employed and so forth, you need to have education going on, you need to have some sense of what is the cost of an action, which could be reflected in the social cost of carbon which

you implied or I implied. Impact assessment is just one venue where this takes place, and the extent to which emissions are addressed effectively outside the Assessment Act will affect what you have to insure you cover under the assessment rules. –(Participant 3)

I think right now there's a really big gap between the policies and the climate targets we've come out with Under Paris and our project level decision-making. [...] I also just doubt that in fact, the government will meet our goals without some kind of a framework for contextualizing emissions within our nationally determined contributions and our 2050 net neutrality goals. –(Participant 2)

What we can tell from this is that there is a sentiment among participants that there is far more work to be done at the strategic level to explain how the totality of our actions to address climate change takes us to our stated goals on this issue. In the context of climate change considerations in EA, without understanding how it fits into some overall strategy that can be reconciled to the final achievement of our goals, it is hard to understand what is grounding the process and the decisions made as a result. As an example, it is difficult to understand how recently approved or recommended projects like Kitimat BC LNG project or the Teck Frontier Oil Sands expansion were shown not to hinder our ability to achieve our climate change commitments. Perhaps it should not be assumed, a priori, that they do, but without any cohesive policy framework that shows how projects such as these reconcile with our climate commitments, it appears, by their nature, that they would violate section 63 of the Impact Assessment Act and if that is the case, it undermines confidence that climate change component of the Act is yielding any substantive results.

One interesting point noted by a participant was that often people who are sympathetic to industry make the argument that climate change considerations should not be in project level assessment, rather they should be dealt with entirely at the policy level. It was noted further however that then at the policy level, industry uses its massive financial and political resources to lobby politicians so that serious policies designed to address climate change never become a reality.

I think one of the big hypocrisies that you see and hear is the oil and gas industry saying “policy questions have no place in EA and should

be dealt with at the policy level” but then you get to the policy level and they send an army of lobbyists that have better means of approaching government and leverage and all that stuff, to make sure that the policies that do come out of the government are pretty much toothless and don’t address the problem of fossil fuels.-(Participant 9)

The quote above shows a link between the barriers noted in sections 4.1 and 4.2, and the complaint in this section related to our lack of clear strategy and plan for achieving our climate change commitments. Moving forward, there should be mechanisms to ensure that at the highest levels of policy development, the government is held accountable not just to those with the most resources and powerful connections, however, this obviously presents a problem beyond the scope of what could be achieved within the topic of how to improve climate change EA.

So what we can see from this discussion is that there are legitimate reasons for needing the Federal Government to produce a more extensive and detailed strategy, policy, plan, or framework, that clearly sets out how our high level commitments on climate change filter down into specific actions taken or decisions made. In the context of EA, this plan would tell us how to interpret the climate change information gathered as part of the assessment so that the decisions made are clearly justifiable and grounded in the context provided by the plan. It would also need to be honest about how we reconcile projects that are inherently fossil fuel intensive and with a sole purpose to extract fossil fuel resources, with our plan for achieving our climate change goals.

4.4 Summary and Discussion

The results of chapter 4 tell us about the existing barriers that have hindered the development of a process for adequately considering climate change as part of EA from the perspective of my participants. As the data has shown, there are economic arguments against a more rigorous approach to climate change in EA, and although project EA is not a suitable avenue for addressing large scale challenges, such as the Federal budget, well beyond its scope, the nature of these challenges have interesting

implications when thinking about the development of an overall framework for moving forward with climate change considerations in EA.

My discussion of economic considerations shows that there is certainly a prevalent sense of economic anxiety surrounding the idea of strengthening the climate change component of EA and what is interesting is how this relates to the political considerations. Economic arguments regarding loss of jobs, decreases in GDP and investment, etc. become the fuel behind political arguments against improved climate change EA laws, as my data shows. The data also shows how we have, in a sense, created our own barriers by cultivating lifestyles and an economy that is driven by resource exploitation that also fuels an existential threat to civilization. We are now at a point where solutions that are perceived as harming the economy are, to many, synonymous with harming humanity and society even if the economy, in its current form, is driving us towards a massive crisis. We can also see this in media coverage and rhetoric that surrounded the Impact Assessment Act 2019. Articles with titles such as “This Liberal Bill Will Hurt Canada and Canadian Workers” written by Bloomberg et al. (2018) are examples of how opponents used economic arguments to create political opposition to aspects of Bill C-69 that they perceived as unfavorable. Notably, the authors of this article were all members of various petroleum and energy associations, and this highlights a complimentary issue that was shown in my results, the strength of pro-industry messaging in the media and in the halls of government in terms of what is possible regarding climate considerations in EA.

My results show that industry groups are known to use their influence to persuade politicians and the public towards favorable outcomes for themselves and that this has certainly been a barrier in terms moving forward with improved climate change considerations in EA. This also seems to be confirmed in literature which documents the strategies employed by industries within Canada to influence public perception and minimize their perceived role in the climate crisis (Talbot & Boiral, 2014). They exert their influence through their access to politicians and through use of their vast financial resources in conventional media campaigns, but increasingly they are also utilizing social media to fund groups that have the character of being grassroots community

organizations (Laville & Pegg, 2019). With social media becoming a primary source of news for many people, this is problematic when we consider other data from my results which showed that climate misinformation is a barrier to moving forward with improved climate change EA. Information from community groups on social media platforms is not held to any journalistic standard, and therefore it can easily spread false and misleading information that would attempt to persuade members of the public against climate change action. This disparity in resources between the powers that are critical of moves to meaningfully incorporate climate change in EA and groups that support such moves further exacerbates this problem since bad ideas will flourish when left unchallenged, which leads to another interesting finding from my results.

The disparity of resources and political access between industry and pro-environmental groups was mentioned in my results and is supported by literature, which indicates that associations related to the fossil fuel industry were the most active group of lobbyists during the 2011-2018 time period (Graham, William, & Chen, 2019). So not only do industry groups have more resources to spread their ideas, they also have greater access to politicians, so the balance between conflicting ideas is skewed towards opposition to considerations of climate change in EA.

If the Federal Government were serious about its climate change ambitions, it has the resources and power to counterbalance narratives that oppose climate action. Specifically, as mentioned earlier, economic arguments are often weaponized against climate action and spread to the public. My results indicated that there is an absence of government direction as to how it plans to reconcile energy agenda and climate policies, and this is problematic when we consider that in the absence of a plan that shows how we get from our current situation to our climate goals with minimal economic duress for the average Canadian worker, opposing narratives are left largely unchallenged. This notion can also be seen in contemporary media reports, Canada is spoken of as going through an “existential crisis” as we “bicker over the country’s energy policy and how it agrees with a national commitment to lower greenhouse gas emissions”, (Tasker, 2020) and this shows the severity and scale of the barrier presented. From this I infer that it would be useful for the government to be clear and comprehensive in explaining how

we transition our economy from a reliance on extractive industries to one that is compatible without climate goals and this is something I discuss more in chapter 6 with data from participants. In understanding why the Federal Government has not made more of effort to chart a course that reconciles our energy and climate future, literature tells us that governments are incentivized against policy innovations they perceive as risky and more towards outcomes that favour the status quo (Howlett, 2014). It is certain that the Federal Government knows that truly reconciling energy development with climate change action is an incredibly challenging political quagmire and is attempting to walk a fine line rather than come out with an explicit plan showing the necessary steps in transitioning to a sustainable economy.

Section 4.3 of my results discussed some of the barriers to climate change in EA from an implementation perspective. Part of the Federal Government's plan for reconciling energy development with climate change could reasonably include further direction on some of the issues noted in my results. One such example would be providing further guidance as to the context through which the emissions of a project are assessed. My findings regarding implementation indicate a key issue is that climate change assessments are hampered without an evidentiary standard of comparison for emissions figures. This is supported in literature that shows that EAs in Canada have been inconsistent in the way that they interpret and report on the significance of their projects GHG emissions (Ohsawa & Duinker, 2014). There are several reasons why this is problematic, one being that without a standard, a project GHG emissions can be minimized by comparison to different baselines, like national emissions as noted in a paper by Chris Joseph (2019). Without understanding the appropriate context for emissions, decisions regarding the degree to which a project hinders or contributes to our climate goals become ungrounded. There is no basis for that determination unless we understand how to interpret GHG figures against other grounded criteria such as an overall carbon budget, disaggregated emissions thresholds by industry, etc. Further discussion on this topic is presented in chapter 6.

Similar to the above, my results show that a standardized approach for alternative assessments and drawing conclusions about whether a project is significant

in terms of section 63e of the Impact Assessment Act 2019 would be beneficial for improving climate change considerations in EA. The focus here is more on ‘alternatives to’ a project, meaning a process for figuring out what other options are available for filling the demand that the original project was supposed to address. My results show that there are concerns about the effectiveness of this process given that proponent paid consultants are asked to make conclusions on the projects the proponents paying them are pursuing and there is an implicit bias inherent in that sort of structure.

Participants felt that those preparing the EA are incentivized to favor the project they are advocating for in the same way they are incentivized to show no significant effect from the project the proponent they are working for is proposing. There is literature that supports the idea that the relationship between proponent and consultant creates an inherent risk that the conclusions drawn from EA are minimized and subjective determinations of significance are biased towards no significant effect (Enríquez-De-Salamanca, 2018). If this is taken to be a serious concern, along with the inability of proponents to conduct a fulsome assessment of alternatives, it seems to imply that an improved EA process that meaningfully considers climate impacts would need stricter guidelines for how we report on the significance of a project and how to consider alternatives ‘to’. Alternatively, a more interventionist approach to this barrier could include consideration of reassigning responsibility for consultant selection from proponents to government, or having alternative assessments be performed by government or an independent panel with varied expertise.

5.0 Moving forward with Climate Change EA

In this chapter I discuss the results of my research as they pertain to ways that we could improve the capacity of EA to consider climate change. Many of the barriers discussed in the previous chapter could only be addressed through the creation of a comprehensive and detailed strategic plan for addressing climate change, and in this chapter I discuss the need for such action, but I also focus on ways that we can improve EA despite this lack of strategic plan. So, in this chapter there is discuss of the high-level policy changes, but also new practices that could be implemented in the absence of a sweeping change in the governments approach to climate change. The data I collected fell along the themes presented in Table 5.1 and each represent a separate component of EA. Main themes emerged from a mixture of my literature review and through discussions with participants, so are therefore grounded in the data. Sub-themes that fall under a larger umbrella of a main theme, were grouped accordingly to help understand their relations in a broader scope and were also grounded in the data.

Main Themes	Sub-Themes
Connecting EA to our International Commitments	
Strategic Environmental Assessment	Deliverables of a useful SEA
Contextualizing Project Emissions	Carbon Budgeting
	Emissions Accounting
	Significance of GHG figures
Project Listing and Triggering	
Alternatives Assessment	
Project Decision Making	
Environmental Assessment as a GHG Mitigation Tool	

5.1 Connecting our International Climate Commitments to Environmental Assessment

Participants were asked whether EA should be used as a primary policy tool for achieving Canada's broader climate change goals, like our international commitments, and if/how they see Canada's climate goals shaping our approach to EA policy. On this topic, nine participants mentioned that it was important for Canada to have an overarching framework, whether it is international commitments under Paris or the Pan-Canadian framework or something entirely new, that acts as the lens through which we approach and make decisions about future projects. The link between a chosen framework and how it influences decisions made at the project level was noted as a gap in current assessment policy as outlined above. Participants expressed that there should be a clear understanding as to how the information provided in a project level assessment contributes to approval decision making in the context of a broader framework. The participant quoted below noted that there is inadequate guidance as far translating how we plan to reach our goal of a 30% reduction in emissions by 2030.

I think the most important component of a strategic assessment is how do high level policy commitments inform project level assessments, and so like the, you know, the most important outcome of it is translating those commitments to even the 30% right, like even the insufficiency associated with the current carbon targets, um, would be important to have translated into, you know, what that means for individual project level assessment. –(Participant 7)

Four participants also mentioned that EA should not be a primary tool for helping achieve our broader climate change obligations. They cited the idea that climate change is too broad of an issue to be addressed primarily through the assessment process and that climate change in the assessment process should be considered through the lens of what other policies are in place to address emissions. The following quotes express their opinions on the matter, and it should be noted that these participants primary held backgrounds industry.

...I think the belief that I hear a lot that it (EA) is the vital number one tool, is wrong. I don't think, however you stretch, divide, multiply your environmental assessment or impact assessment, it is not going to deliver on climate change policy. You need the framework. It's too big an issue and too broad an issue and involves a lot of things that will not, they definitely will not be captured under the impact assessment act and even if you revised it in some other way, you still would not have a tool. So it can contribute to our climate change goals. The contribution will be small, it can't deliver and it's not a substitute for the policy. – (Participant 8)

My answer to that (should EA be used to address broad mitigation goals) is yes and no. It's a big enough topic that there's no question that we have to do something about it and to ignore the possibility of considering it for, you know, projects large enough to be environmentally assessed would seem irresponsible. But the qualifications is that I think it depends on how much has already been addressed relative to that project. –(Participant 18)

The general sentiment of the responses seems to indicate support for considering climate change through EA, and to some degree using our broader climate change goals as a framework for that consideration, but currently there is a gap in understanding as to how EA considerations of climate change fit within Canada's strategy for addressing climate, especially within the context of other climate change policies.

5.2 Strategic Environmental Assessment

Strategic assessment was often mentioned by participants in our discussion of the potential for EA to address our broader climate change mitigation goals, as one method for parsing the connections between high-level policies and project level assessment. Participants spoke about strategic assessment when discussing how we could reasonably begin to address some of the gaps between climate commitments and the assessment process.

What strategic assessments are supposed to do and what this one (The Federal Government's strategic assessment in 2019) should do is identify those policy gaps and fill them. You know, provide us with the

kind of policy direction that we need in order for us to meet our Paris obligations. The strategic assessment, beyond the things I just said, should also just start with a question, what are the gaps? What are the issues that haven't been addressed through government law & policy and decision-making that, you know, we need the strategic assessment to do, and then how do we make sure that the outcomes of it are binding? -(Participant 2)

Participants made specific mention that the strategic assessment recently conducted by the Federal Government was insufficient in delivering any meaningful guidance, more that it was a technical guidance document on how to account for emissions and the results would likely be of no use for the purpose of providing guidance on policy gaps noted previously. Ideally the SEA would have been less focused on the technical component of assessing emissions and more focused on bridging gaps between our climate commitments and project EA with more specific guidance and regulations. As the quotes below describe, participants felt that Governments SEA on climate change did not produce results that bridge gaps between policy and practice.

Yeah, well, there's nothing strategic about it (The Federal strategic assessment). I mean, you can expect a bunch of garbage to come out of it. It's terrible. it's a terrible process and it should not be the precedent for anything else going forward after that. So that's where the guidelines should be coming out. I'm sure we'll try to comment on their draft but, you know, we expect it to be so bad, not sure what kind of engagement we're going to have. -(Participant 9)

Of course, the government has just floated a draft strategic assessment for greenhouse gas or climate change, I'd have to look it up on the CEAA website. The language is being mangled, I think deliberately to create confusion, so the document that has been released as a strategic assessment is really just guidelines for how to, it's like a filing manual for greenhouse gas emissions for major projects, it's not a strategic assessment of the ability of Canada's greenhouse gas policy or energy policy to improve global atmosphere in terms of carbon dioxide. -(Participant 17)

On the topic of strategic assessment, participants were asked to consider how they envision a successful strategic assessment of climate change policy in Canada. This conversation gave way to two main types of discussion, one specifically about the deliverables of such a process and the kinds of information and solutions we may be

able to expect from it. The other conversation was broader in nature and related to the Federal Government's inability to produce a coherent strategy for addressing climate change with policies that reconcile with its other objectives, such as federal energy policy objectives.

5.2.1 Deliverables of a useful Strategic Assessment of Climate Change Policy.

When discussing the components and deliverables of an effective strategic assessment of climate policy, participants had many suggestions for what should be included. One of the main focal points was on the issue of delivering guidance on how project level information collected during an SEA influences decision making on project approval in the context of Canada's climate commitments. Participants also mentioned that strategic assessment could provide guidance on which emissions should be included in an assessment, and on how to interpret the meaning of those emissions in the context of broader climate goals. The following quote from participant 3 speaks about two important components for an SEA of climate change to deliver on.

Well, the two big things are, determining what emissions to attribute to a project, and that includes things like negative emissions as well. If they're sequestering carbon through some major activity, I don't know maybe rebuilding soils throughout the prairies, then they're contributing to the budget available. So, if you're permanently sequestering more greenhouse gasses, more power to you. So, the negatives of emissions there's also the positive ones. You need to determine what are attributable to a project. Secondly, you need to figure out how to interpret the implications of those emissions for meeting the greenhouse gas elimination commitments. –(Participant 3)

Another possible outcome mentioned was the determination of an evidentiary standard or threshold in SEA for understanding the significance of the emissions of an individual project. This came in the context of a strategic assessment as a process for delivering carbon budgets as a means of interpreting emissions information.

You need to figure out how to interpret the implications of those emissions for meeting the greenhouse gas elimination commitments, so you have to establish the basis for those tests, that's us doing a strategic assessment, it means setting up carbon budgeting, it means

determining the social price of carbon. As I suggest I think that's harder, more demanding, and probably more controversial but if you don't do that then you're just making arbitrary decisions on the basis of no agreed-upon methodology or overall standard of expectations so nothing's defensible. –(Participant 3)

The quote above shows that there is the opportunity for a strategic assessment to provide this point of comparison, and this participant would like to see it in the form of a quantifiable methodology that can be applied to the results of project assessment. Another interesting point to highlight was the participants acknowledgement that without such a basis for comparison, decisions are not grounded in anything concrete that is tied back to the overall strategy. Reflecting on this point we can see that this would be an avenue for future work in finding ways to tie our project level activities to high level policy goals.

Further to interpreting the emissions of project assessments, one participant noted that its vital that there is a clear link between strategic, regional and project level assessments. The results of these assessments should inform one another and there should be a legislative foundation to ensure that results of strategic and regional assessments are binding to subordinate project level assessments, assuming they are done well and meaningfully incorporate climate commitments. It is also important that information from project level assessment flows up the hierarchy so that strategic level considerations are further informed by project level findings. The following quote describes how participant 2 would envision a functional process for how the different levels of assessment would influence one another.

Yeah, I think that it's critical that regional and strategic and project level assessment, and land-use planning, even things like the species at risk act recovery strategies, those all need to be tiered, ideally, to legislation so that you're not doing strategic or regional assessment just to have the report sit on the shelf and only be considered a project assessment. They need to be binding on the outcomes regional and strategic assessment. They need to be binding on project level assessment and project level assessment needs to feed up to regional and strategic assessment. So let's say you've done a strategic assessment of climate and then a few years go by and you do a bunch of assessments of

projects, GHG emitting projects, you need to feed all that information about how those assessments went, what works, what didn't, what emissions have been approved, back into the strategic assessment and periodically update it based on that information so that the policy direction it provides or the regulatory direction it provides is helpful. – (Participant 2)

Key to what the participant above is saying is that they envision strategic and regional assessment as a regularly occurring and evolving process. As we approve projects, the landscape and environment changes and we can learn from those changes, and so too should the strategic assessment be updated to reflect changes in the environment and our understanding of it.

Other possible outcomes of a proper strategic assessment that participants mentioned included the determination of the scope of alternatives to be considered when performing an alternatives assessment for a proposed project. One of the issues noted in the previous chapter was the problem of properly considering alternatives due to the narrowness of consideration that has historically taken place within assessments. Two participants mentioned that consideration of the types of alternatives should first be determined at the strategic level rather than at the project level. This would then filter down to the project level and provide guidance as to what the appropriate 'alternatives to' are for a given project and how the assessment should be performed. Further to this, these participants noted that this type of undertaking is best done as a collaborative process between government and proponents, and that having it fully in the hands of proponents is not appropriate for an effective process.

One of the big difficulties with assessment is how do you get reasonable alternatives beyond the proponent's interest considered, who does that? Generally, it should be done at the strategic level where that stuff is worked out in overall policy thinking, energy policy, economic policy and so forth, and generally speaking we don't have that. –(Participant 3)

Participants also mentioned that strategic assessment should set out, in the context of project assessments, which emissions have appropriately been considered

through other policies so that projects are not burdened by having to consider things already deemed to be addressed. The quote below describes this concern regarding the possibility for duplication to waste time and resources.

And so, our company is subject to both the equivalency agreement and the cap and trade requirement, and quite frankly, if we achieve those and we bring a project forward that we think is consistent with those and is within those numbers, in our opinion, cause that will have already cost us hundreds of millions of dollars, we're done. We've done what we're supposed to do, maybe even more. And so, under that circumstance, this exercise that the federal government has under way with strategic assessment climate change, we would say, sure, but build some off ramps for situations where it is already significantly been addressed. –(Participant 18)

This participant understands the value of the strategic assessment but is concerned that it needs to account for all that has been required through other emissions reduction regulations. This seems to be a concern related to cost and a worry that a lack of cohesion in federal climate change policy will result in time and money spent to address issues that have already substantively been addressed. From the conversation with Participant 18, the hope was that strategic assessment could determine what project EA should consider in the context of all the other policies designed to address climate change that would affect projects. This would appear to be something that could be examined in a proper strategic assessment, holistic consideration of what the government is doing to reduce specific sources of emissions.

Contrary to the sentiments expressed above, one participant was highly skeptical of the ability for strategic assessment to yield anything of value. This participant provided a rich and detailed account of how they saw the flaws in SEAs as they have been performed in the past, and from this description I was able to find many interesting points regarding weaknesses to consider for future SEAs.

What I've actually observed when Canada actually convinced the Agency to try to do strategic assessments, they've kind of failed. One for the Beaufort Sea became sort of a science review, you know, the science part of it worked fairly well, but strategic assessments are a bit of a red herring for a variety of reasons. One is that they're generally an

attempt by the federal government to step into provincial natural resource areas, and they're often not well-received by provinces, environment being, of course, a key area that is shared in the Constitution between provinces and the Federal Government, but when they attempt to do a strategic assessment on energy or bitumen or anything like that, they will be treading very heavily on provincial views of their ability to do land use planning based on democratic principles, etc. So that is fraught. The Feds never provide enough money to do it [SEA], so it tends not to work out well, and then I think a potentially really fatal flaw is say, even if in the Northwest Territories where you have a bit more flexibility in terms of territoriality, or in Nunavut where they're going on right now, they tend to be a general review of pros and cons and potential effects of an activity such as offshore oil and gas exploration. They're not associated with a specific project, and the conclusions that come out of these strategic EAs are basically just bureaucrats' opinions or somehow the report has been rolled up by federal employees, typically, or co-authored by the territorial people, but they go stale very quickly. So if 3 years later, arctic oil and gas exploration is probably a lousy example because of the moratorium that has just been imposed, but if there is a project coming up, no one will put any weight on conclusions that are 5 years old based on a somewhat fuzzy, often poorly managed and underfunded process, and you start all over again, partly because the information may have changed, often because the personalities have changed, people have moved on and no one has any ownership or stake in the document, the document is fairly vague and full of good ideas that have no actual weight in law or regulation. So the strategic EA has tended to get a reputation for being the stalling tactic or diffusing tactic, or a way of advancing the Federal focus group process where they want to test policy ideas. – (Participant 17)

This quote is interesting for what it says about the implementation issues that have plagued past strategic assessments. Previous quotes and discussion have talked about all the potential deliverables of an effective strategic assessment, but if it suffers from the same flaws mentioned in the above quote, it could significantly undermine the results. Going forward, it will be important for effective strategic assessments of policy in particular to be regularly updated to stay relevant, adequately funded, and supported by a department that maintains continuity of the process and staff as best possible.

5.3 Contextualizing Project Emissions

One of the most common topics to come out of my discussions with participants was the need to contextualize emissions. This was noted as a barrier in section 4.3 and in my interviews, I explored ideas for how tracking and contextualizing emissions as a solution to this problem. Developing a system for contextualizing emissions appears to be a fundamental requirement for improving climate change considerations within EA because without some sort of method for doing so, emissions figures reported within EA have no basis for understanding their significance. This would also be an area where improvements could be made to project EA in the absence of further policy direction coming from an idealized SEA process. Taking action to provide more informed context for emissions is something that can be implemented as a best practice guide for practitioners and would not need to be derived from an SEA. The quote below describes what one participant felt is the key value in determining an overall strategy for contextualizing emissions.

The first step is the equivalent of a national accounting process and importantly, along with the recognition of existing frameworks, opportunities, policy, plans, programs, whether it's the Pan-Canadian framework, whether it's I don't care what it is but there's something, what is the something that individually when you line them up together, constitute the evidentiary point of comparison that I may then use and inform the information requirements for a specific project to then provide the basis of comparison, analysis, assessment and discretionary interpretation in the context of the individual project and in other words, what I'm working with here. What do I have to provide you? Government, so you can make your right decisions. –(Participant 6)

As this quote shows, emissions figures gathered in EA need to be given context so how they are relevant to decision makers is easily understandable. We can use existing policies and plans, like the Pan-Canadian Framework, to derive this context so it is something we can do despite the lack of strategic guidance. In the sections that follow I elaborate on some key participant responses for how to account for and contextualize emissions from a project.

5.3.1 Carbon Budgeting

Carbon budgeting was discussed as one of the methods of contextualizing emissions. Participants were asked about their thoughts on the usefulness of carbon budgeting and they expressed support for the idea noting that it would be useful if done properly. Carbon budgeting was discussed loosely with participants meaning that we addressed the idea as a regulated and enforceable limit on emissions, but also in terms of a useful tool for assessing the impact of emissions and not necessarily something enforceable by law. Of those asked, 2 more were not familiar enough with the concept to comment, and another 2 focused their responses on the problems that would be encountered when trying to develop such a budget for Canada. From my perspective the results revealed strong support for the idea of carbon budgeting as tool for contextualizing emissions.

If you're serious about actually reducing emissions to 0 by 2050, or whatever date you choose, if you're serious about meeting your obligations then you have to figure out what that actually means, what sectors and so forth have to do, there's no talk of that so far as I can tell, any regulation development or with the strategic assessment, so-called, that they're doing. –(Participant 3)

One participant explained exactly why it is important to have a carbon budget for different sectors and regions, and then also went on to explain why it is important we update these budgets incrementally all the way towards our goal of decarbonization by 2050.

Yeah, I think they (carbon budgets) can be quite useful. I think one of the biggest problems that we found in assessment is trying to contextualize emissions, right, even when you're using Paris as a proxy, which hasn't, I don't think been done very much if at all in assessments, it's still going to be very difficult to say that, you know, 2% of Canada's emissions portfolio is a significant amount. So, but when you begin to break down, so take one of the BC LNG Pipelines, you know, they may be emitting somewhere between 2 to 5% Canada's overall emissions portfolio, but in the BC context, that figure is going to be exponentially higher, and then if you look at the energy industry within British Columbia, all of a sudden then one LNG project is probably over the threshold. The other thing I think we need to look at is

we need to be taking those thresholds and applying them into the future over the lifespan of the project, because if we're going to have declining emissions until 2050 then we're going to need incremental budgets. Those budgets may need to be updated every 5 years or so, we should at least be setting out, you know, like interim budgets for five-year increments to 2050 so that we can be looking at, you know, the pipeline that will be online in 2045 it's going to have a much different, taking up a much different piece of the carbon budget in 2045 than it is now. – (Participant 2)

This quote clearly explains why having the proper context for emissions is important and shows that there is support for using them even if they are not going to be regulated as a limitation on emissions. Without having a something like a budget to compare emissions to, emissions figures can be made to seem insignificant or significant depending on the standard of comparison. This participant also ties the budgeting method into a future oriented strategy of considering not only the emissions taking place now, but the emissions levels required in the future and then considering current day projects against where we need to be within the time horizon of the project. Further to this, enacting carbon budgets allows us a means of holding ourselves accountable to the goals we set as the budgets provide a metric for assessing whether we have achieved what we have set out to accomplish.

While carbon budgeting was strongly supported by participants, many also did express the concern that although it would be ideal to do in theory, in practice they were skeptical that the political will existed to do such a thing, or that the federal government would be able to cooperate with all the required parties, the Provinces, industry sectors, etc. in order to develop a budget for the nation.

Of course it would be the gold standard, but to arrive at sectorial or regional carbon budgets that are anchored in science and fair share would require a level of political and social debate in this country that I honestly find impossible. Given the state that were in right now, I don't see how we get to a good outcome on that, so I guess the best we can hope for is independent analysis of what fair and technically feasible carbon budgets would look like and try to include that in EA, but I don't think the governments going to adopt that approach like it's been done in the UK or... I mean that would be lovely, but this is a country that's

barely governable as it is so I don't see that happening, but I would love for it to happen. –(Participant 9)

More than one participant expressed a concern that politics would be the main issue to confront when trying to implement a carbon budget approach to climate change EA. In these discussions, carbon budgets were discussed as regulated limitations on GHG emissions and thus one of the main concerns was achieving the political support to enact regulations that would bind sectors to a budgeted amount of emissions. Another participant specifically mentioned a concern regarding how the budget gets decided and how emissions are allocated.

I think there's a significant opportunity or role for carbon budgeting, but the way things are allocated and decided on is where the magic happens. So I could agree one day, yes, then the next day find out the way it's getting decided... so I could decide in a baseball game, I was watching one last night, that I'm going to abide by whatever the umpire's calls a ball or strike, but halfway through the game if I think that you're calling a lot of things that aren't going across the plate, a strike, I might have questions as they sometimes do, and get thrown out of the game. –(Participant 18)

This participant's analogy shows how concerns about the way in which budgeting decisions are made might cause the process to breakdown if the parties involved do not feel there is any consistency of fairness to the way the budget is determined year to year. This suggests that a carbon budget approach would need to be a collaborative process that achieves its legitimacy from consultation and agreement among those industry sectors to which the budget would apply, however based on findings in chapter 4, it is unlikely that this process would be without significant conflict. Further to this sentiment, another participant, when discussing carbon budgets, expressed fairness concerns over Canada's current attempts at GHG mitigation and noted Canada needs a framework to understand that totality of what is being achieved by its reduction efforts. Without some a proper framework, like a carbon budget, it is impossible to fully appreciate the reductions made by one industry and the increases in emissions by

another. One participant expressed frustration that there is no process for considering the overall emissions picture.

Yeah. I mean, right now, our national climate change sort of framework, when you add it all up, it's just a giant cluster..., and I won't say the other word cause you're young and I don't want to shock you. Right, like and you could only apply that kind of methodology (Carbon budgeting) in an assessment if you're applying, if you have a sort of the overall, but you can't just use it in assessment, because it doesn't make sense. This is one of our frustrations under CEAA 2012 and its approach to addressing cumulative effects and greenhouse gases and climate change are essentially a cumulative effects question where the proponent of a project could, you know, mitigate, reduce and provide off sets and have a net positive contribution, and yet have to be considered to have significant cumulative adverse effects. In the meantime, other sectors are just blithely continuing the destruction. So, you're kind of going, what the heck, you know, we're planting trees and they're logging them. –(Participant 8)

What we can tell from this is that carbon budgeting is one possible solution that could be used to bring context to the entire picture of Canada's GHG mitigation strategy. This would be a benefit of an approach to carbon budgeting as informative tool for showing the emissions context of an entire sector or region to figure out sources of emissions and better identify areas for reductions. It could provide an opportunity to ensure the strategy is fair and consistent, and that reductions effort are targeted towards projects and activities that are shown to consume proportionally significant amounts of the budget.

In addition to fairness considerations, one participant made an important point that a carbon budgeting approach would need to include a process that considers the accumulated emissions of smaller operations.

It should not allow for, because it requires monitoring about budget, a lot of the smaller players to escape being looked at. Generally, that's one of my concerns, right from the beginning when I said I'm not sure the impact assessment is the right tool because it only looks at a subset of projects. Similarly, I think you want to make sure that there is something there that the carbon budget would get, that there's accounting for industries at-large and that that allocation occurs sort of

appropriately throughout these various industries so that you don't allow some players that are many, but small, to escape. –(Participant 13)

The concern here appears to be one of cumulative effects, and a carbon budget is itself an attempt to mitigate cumulative effects by specifying a cumulative budget for an entire sector. Here the participant seems to be advocating for a means of ensuring that small emitters are expected to work to reduce emissions rather than getting by based on their relatively small contribution to the entire sector. For a regulated limitation perspective, this would imply the need for a process to ensure that smaller emitters are still held accountable to any carbon budget because of their combined cumulative effect. Additionally, tracking information on smaller projects and inputting their emissions figures into a carbon budget would provide a valuable source of information they could be instrumental in designing policies to reduce the emissions of smaller projects.

If a participant seemed to have an extensive knowledge of carbon budgeting, a further question was asked regarding how a carbon budget might affect the approval of projects and how we would decide, given a fixed budget, which projects should be prioritized for approval.

Oh yeah, I think definitely a clear compatibility with decarbonization pathways should be the project that goes forward and also sort of the projects that are life-sustaining, you know, like agriculture, even if it's admitting we need to eat. So I would prioritize agriculture over consumption based and luxury based definitely. There's also a social equity aspect to it and also like emissions that occurred, let's say in the North or indigenous communities, they may not have alternatives and, you know, they're the foremost victims of climate change and they have not contributed mostly to it. –(Participant 9)

The response above indicates that given a fixed emissions budget, greater effort would need to be made in determining which projects add the most life sustaining value to Canadians. The logic behind this obviously being that given the constraints imposed by climate change, it would no longer make sense to pursue luxury items over those that are necessary. Certainly, this type of endeavor would be very controversial for the fact

that within it comes many social and economic consequences should some industries no longer be prioritized. This type of decision-making framework would come right into conflict with the political and economic barriers mentioned in chapter 4. It is important to be aware, however, that it is likely that climate constraints will necessitate a decision-making framework or logic that needs to be informed by the relative life sustaining value of certain types of production.

5.3.2 Emissions Accounting

Whatever method or framework is chosen for contextualizing emissions, participants agreed that a standardized method for reporting on the emissions of a project will be required. Without an agreed upon format for reporting emissions, results cannot be meaningfully compared and analyzed within the chosen context.

One of the contentious issues on the topic of emissions accounting was whether to include and consider the downstream emissions of a project in the final project assessment and decision. The topic is very complicated, so the participant responses were not as clear cut as, “yes, include vs. no, do not include”. One point of view that seemed to be shared among some participants was that downstream emissions domestically should certainly be included in consideration, but the matter becomes very complicated and challenging when we consider emissions from Canadian products burned internationally.

What you attribute is, broadly speaking, everything that will have an effect on the world and so it may be that you've got useful controls in other areas, however, Canada certainly has responsibility for the emissions it has domestically. All upstream and downstream consequences of projects that will have domestic effects, should be covered. That should be a no-brainer. How do you deal with downstream effects offshore is more difficult, in part because you may not necessarily know where offshore they are going. –(Participant 3)

Another point of agreement among this group of participants was that whether or not internationally burned emissions are considered, there should at least be an attempt to

gather and analyze the best information possible on those emissions so we can inform other decisions about how to structure climate policy.

So downstream emissions within Canada absolutely need to be included, if it's a Canadian EA, if the project is being done in Canada, if it's like an energy production, oil or gas or bitumen or whatever that they're burning in Canada that needs to be accounted for here. When they're being exported, I'm not sure where that happens but that needs to be, my own personal view is that that should be revealed and be part of the analysis because ultimately it's a global problem, it's a global cumulative effect and it matters regardless of where you burn it. – (Participant 12)

Maybe it's not appropriate that we consider downstream emissions when we actually finally make the decision but should we just be gathering that information to get a comprehensive picture. –(Participant 2)

When it came to downstream emissions, participants noted the uncertainty around getting reliable emissions figures as part of their hesitancy to say that it should be included and fully considered in the decision-making process of an EA. Specifically, the high level of variability of projects that would be assessed would make it more difficult to determine downstream emissions for some projects versus others. As an example, the downstream emissions from a nuclear powerplant would be easier to determine as it does not produce a product that is shipped and consumed off site, whereas a mine or an oil and gas facility produces products with a wide range of uses that travel to many different sites and would therefore be harder to estimate.

Life cycle would be good and there's undoubtedly going to be some uncertainty because, for instance if we use the mine as an example, what will the end products be? Or what will the end uses be? And that can be uncertain at the time of the assessment, and so of course we're not asking that it be so hypothetical as to be not even practical in that moment but I think if we're to achieve greenhouse gas emissions reductions we have to be able to quantify what we'll call the upstream and downstream effects as best as possible. –(Participant 11)

One participant noted that it would be very challenging for one institution to be able to determine or to assess the validity of downstream quantifications for every type of project that would fall within federal jurisdiction for this reason.

I think if Environment Canada was charged with doing this (Life cycle analysis) as a regulator, they would have a very hard time regulating that kind of approach. –(Participant 13)

One participant with a background in performing EAs was less optimistic about the value of quantifying and including downstream emissions. Their concern stemmed from the highly conjectural nature of downstream emissions numbers and they questioned the value of such an exercise.

It is so easy to talk about upstream and downstream emissions from a theoretical academic point of view. [...] however you don't see it until you do it, which is, that I have to cobble together conjectural based information of such a heightened state of uncertainty, that were that state uncertainty applied to anything else in the assessment it would be out of hand rejected by the very same people who want upstream and downstream. –(Participant 6)

As a possible solution to this issue, one participant suggested was disclosing uncertainty ranges along with the quantification of emissions so that decision makers can weight those emissions in the context of the uncertainty, similar to what the IPCC does with its reporting on climate change.

I think what we need is the accounting of the potential for that (upstream and downstream emissions) and the uncertainty range, and that needs to be available to the national carbon accounting mechanism that is established and it needs to be consistent with whatever standards they set. –(Participant 12)

Another participant suggested that the methods and models used to estimate downstream emissions of a project should be open source so that they can be tested independently. Making the methods of quantifications transparent would add legitimacy

to the outcomes since they can be independently verified. It could also improve the methodology by allowing outside feedback that would strengthen the process.

I think that's an overarching issue that's super important, like, every model that gets used to attribute emissions, to forecast future markets, should be open source and transparent and everyone should be able to test the assumptions and do their own independent testing. In California those models are open source for everyone to check, in Canada for some reason all of these models are proprietary so you just get told what the outcome is, you can't test the methodology of how it was arrived at and that's a massive flaw. –(Participant 9)

Participants who were not in favor of considering downstream emissions noted the lack of controllability of those emissions on the part of the proponent as a reason for why they should not be included.

Well, I think a standard accounting for upstream, yes. In my view, expanding any projects to the downstream emissions is impractical and has really resulted in a great deal of uncertainty for a number of projects because a lot of those downstream demands are out of control of any proponent, and that's where we get into a little bit of the public policy debate being imbedded into a given project. –(Participant 14)

What can be said from the responses on emissions accounting is that there is strong support for a standardized framework or methodology for tracking and comparing emissions in Canada. On the matter of which emissions get counted, there is less agreement as to whether downstream emissions outside of Canada should be counted and attributed to a project, but there seems to be a recurring theme that at the very least, we should be trying to quantify downstream emissions to improve our knowledge of the overall emissions picture. This information, while perhaps not used in the final project decision, could be useful in figuring out how to structure other climate policies that could address these emissions.

5.3.3 Significance of Greenhouse Gas figures to Project EA

After discussing which emissions should be accounted for, participants often spoke about how the next relevant question that needed to be answered is what do

these emissions numbers mean in terms of significance for project decision making. This is separate from the topic of contextualizing emissions in that it was a conversation focused on understanding how all the information provided, the total emissions of a project properly contextualized, will influence the final decision of whether a project has significant effect on climate change and therefore whether it should proceed.

So all that to say, we need good numbers, they're not hard to do. There's people who can do it. There are consulting firms who can do the p-stream scenario modelling so that's not a problem at all. What is a little difficult for me to get my head around is, what do you do with those numbers? And people who want to block a project will use them one way, people who argue that we need a project will use them another way, so it's just well, kind of just hot air to be used, again, as part of the national focus group exercise of whether we want to have these projects or not. –(Participant 17)

Typically, the approach in EA is to provide a statement of whether the project is deemed to have significant adverse environmental effects, and one participant pointed out the failure of the current approach to significance determinations by referencing how we have had years of projects with no significant effect yet environmental degradation persists on a massive scale.

Yep, yep, you get this vague answer that doesn't tell you anything and if you knew effect size from all the various projects that were being developed you could integrate that up to actually see where you were going. Becky Smith from EPA sort of summarized this beautifully at a workshop in 2003 where she said "EPA is interested in cumulative effects except we've had decades of projects with no significant effect yet we continue to lose our biodiversity and those two facts aren't reconcilable". –(Participant 12)

As a solution to this, this participant suggested that statements of significance are replaced by a statement of the quantifiable effect size of the project.

So we need really clear and unambiguous decision criteria, and we need a requirement that people will be reporting on the effect size, not their opinion of significance which can be fudged. –(Participant 12)

The sentiment among the participants who spoke about significance of emissions was that the government needs to provide more information as to how it will interpret the emissions figures presented within an EA. Ideally, there would be a clear path to understanding how the emissions of a project are deemed as justifiably insignificant or significant based on the overarching framework that provides the context for Canada's emissions reduction strategy.

And so for the climate change file, you first need to have that framework, whether it's a carbon budget, carbon pricing, an intensity based, whatever it is that you do, it has to be a coherent framework, and then you can slot the impact assessment within that framework. If you don't have the framework, you then in the impact assessment, you simply consider what's the mitigation what's the overall, um, impact and a whole bunch of things that you have to balance. –(Participant 8)

Again, this participant has emphasized the need for a framework through which decisions made in impact assessment can be understood. This seems to be the prevailing sentiment on this subject; there is a need to have decisions about the significance of a projects effect grounded within an overarching strategy for emissions reduction.

5.4 Project Listing and Triggering Approaches

The Federal Government's Physical Activities Regulations, under the IAA, also known as the project list, came into force on August 28, 2019, and could be characterized as a project listing approach based on types of projects and project outputs, but it is absent of any climate specific trigger for assessing projects. Six participants specifically mentioned that it was very important that there be a climate change-based criterion for adding a project to the designated project list.

That's one of the failures is not having a climate related category in the assessment process or in current project list. Why would you, you know, if you're considering it as a factor to be considered, if you're considering it like a review-to-review panel in section 36, and if you're considering it as part of the public interest in 63, why wouldn't it be a

part of your designation process in the project list? There's a definite lack of foresight. (-Participant 7)

One of the proposed solutions for incorporating climate change into project list considerations participants offered was to use an emissions-based threshold. Any projects over the threshold would be included for assessment and over time, the threshold should decline in order to reflect our need to rapidly decarbonize by 2050. The following quote from Participant 2 explains the approach.

I think in terms of triggers, one really obvious one is that we need to have some kind of a greenhouse gas trigger for impact assessment. So since the government, in their infinite wisdom, went with a project list approach for CEAA 2012 and the proposed Impact Assessment Act, what that would look like is having an entry on that project list that says, you know, "any project that will emit over 50000 tons of greenhouse gas emissions per year", and then you also probably need to have a declining threshold since we have this 2050 net neutrality goal, so you know, up until say 2030 we have an emissions threshold of 50,000 tons and then 2030 rolls around and we're down to 25000 let's say, and then by 50,000 any project that's going to propose to emit GHG emissions beyond 2050 with automatically have to be assessed. -(Participant 2)

A second participant repeated the same suggestion and made note of the fact that this is not where the government has chosen to go with their Impact Assessment Act legislation.

So we propose a climate based trigger to put projects on the list based on emissions per year that will decline and that's really not where the governments going, actually their latest documents on which projects will be on the list does not contain a climate trigger and does not contain a climate lens in the sense there doesn't seem to be a rational connection between what projects are on the list and whether they are climate important or not, like cement factories aren't on the list, things like that. -(Participant 9)

Another participant drew a connection between project listing decisions and the need for consideration at the strategic level of whether or not EA would be the best approach to address the emissions of the project. The response below indicates that it is important

to have a climate relevant consideration for the project list, but there should also be strategic thinking as to what the best way to mitigate the projects emissions. Consideration of whether the project needs an assessment based on climate relevant factors should take into account all the other options available in terms of mitigating GHG emissions.

Well, from a climate perspective I think it's sensible to have categories of undertakings that are going to be reasonably important for hindering or contributing to climate change. Some of those issues, initially, may be best addressed at the Strategic level to determine generally what the implications are for projects. Just because your project has some climate implications doesn't mean that assessment is the best way to deal with it, maybe the best way to deal with it is a carbon price? - (Participant 3)

In addition to the absence of climate-based criterion for classification, one participant pointed out problems with the project size thresholds set out in the project list regulations. Their complaint stemmed from the fact that the approaches is easily circumvented by proponents who limit the size of their projects to just under the threshold, and then in the future, apply for permits to expand the operation, again coming in under the thresholds for the expansion.

When you have a project list, just by the very nature of having a list you are going to forget some things on that list and then when you're itemizing the list, they've introduced thresholds, so nuclear reactors under 200 megawatts don't get an environmental assessment, and similarly mines that don't produce a certain amount of ore per day, they're exempt from environmental assessment law. -(Participant 11)

This participant touched on another interesting point about the project list, that by nature of the process, itemizing projects, some things will be missed. This seems to be indicative of a flaw in the overall approach, and it was also noted by another participant that the project list approach is likely to miss a substantial subset of the projects that are contributing to climate change.

I think what the government has done, with those two, with the project list regulation and with the Act itself, is to come up with a very comprehensive, somewhat onerous, process and an Act that would only apply to those very large projects, and very large resource projects that fall within federal mandate. So it's a very small subset of the type of projects that pose impacts to climate change and if we rely simply on that act, we will miss, I don't know, 95% or more of the industry's posing problems for climate change. –(Participant 13)

As a solution to the issues of proponents skirting under output thresholds and projects being missed entirely, two participants suggested that it would be beneficial to have an approach that treated all projects as having significant adverse effects unless proven otherwise.

The problem with project list is that it's taking the approach that we know everything that's going on in the world, not really taking into account the whole unknown unknowns, so at the very least an approach that would say "anything that is potentially adverse to the environment gets assessed, unless we can prove that it doesn't carry any significant impact," would be better, you know, like putting the onus on proponents to show that there is no impact rather than the public having to demonstrate that there's a risk to add a project to the list, would probably be better. –(Participant 9)

This type of approach was opposite to the concerns of participants with a background in industry who were concerned with an approach to triggering assessments that does not place onerous requirements on projects that, in their opinion, do not warrant assessment. These participants mentioned that there are issues with production as the metric for triggering an assessment because it is not a fixed relationship between production and emissions therefore greater consideration should be placed on the desired outcomes, and they mentioned that expansions for projects should not need assessment if there is not a material increase in emissions.

One thing that it doesn't necessarily do is enable very high performing environmental projects to advance underneath so again, if I have a facility that's producing a certain amount of emissions at a certain production rate and then I go and have the exact same facility that's producing with zero emissions, they still have to go under an

assessment, right [...] given the limited resources of both government and the proponents and if we really want to ensure that we're spending our time on those projects that do have the potential, we have to make sure they're able to be evaluated in a fulsome manner and evaluating projects that have very little environmental impact or are primarily within provincial jurisdiction might not be well used time.-(Participant 14)

5.5 Alternatives Assessment

Participants were asked for their views on performing alternatives assessment within EA and how they would envision an appropriate process for conducting such an assessment in the context of climate considerations. Participants with a background in activism or academia were very supportive of the notion of alternatives assessment and had specific comments on how it could be done properly.

...we really need to be looking at the broad spectrum of alternatives like demand side management, you know, whether or not renewables could fulfill those energy needs, you know. I think with any kind of project that proposes to ship bitumen across the country and it will generate jobs and help the economy, that we need to be looking more broadly at what other ways we have that we could meet those broader public goals of you know, jobs and money.-(Participant 2)

One of their main suggestions was that their needs to be agreed upon criteria for how to properly compare the pros and cons of any proposed alternative 'to' and these criteria need to be based upon shared values and a link to our broader sustainability goals.

What we have proposed is the use of decision-making criteria which we've already talked about, right, so coming up with metrics, you look at all of the values that apply environmental assessment, you know, our ability to meet Paris is just one of them, there's sustainability, there's the broader socio-economic well-being of Canadians and in particular effected communities, there is upholding indigenous rights. When you start to take all of those values and goals, you need to factor them into the decision-making somehow. -(Participant 2)

Another participant conceptualized this type of analysis as a consideration of the trade-offs inherent in each type of project under consideration as an alternative. Rules for

consideration of trade-offs have been written about and discussed, and application of them to a federal alternatives assessment process was supported by the following participants who lays out three components for successfully considering trade-offs in an alternatives assessment.

First I have always argued that in assessments, quite aside from climate change, we should be comparing the reasonable alternatives and some of those alternatives are things that a proponent can do and can't, you can have pipelines of various sizes for example, there's all kinds of things you can do with projects to increase decrease the likelihood of significant adverse effects various kinds. So comparing your options to avoid the ones that have the worst trade-offs is a good idea. Secondly, it is possible set up trade off rules. The first book I did on sustainability assessment that I did 15 years ago or so, how to chapter on trade-offs rules that would apply anywhere in the world to any kind of project. Turns out there's not very many of them, mostly you want to require proponents to justify the trade-off as being unavoidable or less bad than other options. Secondly, you want to ensure that it's all an open argument with people can weigh in on their analysis. Thirdly, we thought a general rule was there could never be justification for a trade-off that displaces significant adverse effects to Future Generations unless all the other options were worse for future Generations, on the grounds that those interests cannot now be at the table, because you're they're born yet, so as a general rule I think that applies in Spades to climate change. –(Participant 3)

It was also suggested that alternatives assessment should focus on the intended purpose of the proposed project. Considering the intended purpose helps to reframe the decision so that the alternative that can best achieve the desired outcome is selected.

I think part and parcel with the alternatives assessment is um, there's a consideration that requires you to consider the purpose of the project and so the decision maker can look at the project and say " well what's the purpose of this, is the purpose because we don't have enough energy supply or is the purpose just for economic gain?" And so it kind of goes together, and so if you know what your purpose is, what are you trying to achieve, you're trying to help First Nations communities be connected to the grid let's say. Well, there's many ways you could accomplish that, so having the purpose set out is really helpful when then you move onto your alternatives analysis you actually know what you're trying to accomplish. –(Participant 11)

The choice of alternative should then be justified against the intended purpose.

One of the challenges of alternatives assessment is that the scope of the possible alternatives is often much broader than the expertise of the proponent proposing the project. In the past, this has led to criticisms that the process is ineffective at meaningfully considering alternatives 'to'. This participant provides their perspective which illustrates some of the trouble of proponent led consideration of alternatives.

The alternatives to is very perplexing, because what it basically asks the proponents to do is if you're in the business, if you want to propose a project which does a certain thing, we would like you to think of and consider projects which you have absolutely no knowledge of, no experience in and do, by some arguments, an equivalent fulsome assessment on what that all means. What do you do with this picture? I don't think it's the place for regulatory EA to do that, in fact, right now it is, I will admit, and understandably so, it is minimized. –(Participant 6)

The above quote expresses this participant's opinion of the problems with alternatives assessment. The issue appears to be that determining what should be considered an alternative is quite a challenging exercise when it comes to highly technical projects, and that for some projects, if the main consideration is emissions, we can already assume the outcome, that fossil fuel projects will have more emissions than their alternative options. This would seem to return us to a previously discussed problem whereby alternative assessment could bring us back to that challenging question for which the government has yet to provide an answer, does Canada want to continue producing fossil fuels? As I discuss further in Chapter 6, a good strategic assessment could help alleviate the issues this participant has mentioned. Proper guidance as to what constitutes an alternative 'to' classes of project could help bound the alternative assessment so that those who perform it know exactly what range of alternatives they are expected to consider. In response to the problem of proponents having insufficient expertise to be responsible for performing the alternatives analysis, one participant suggested that it be a joint process conducted by the government and with public

involvement. This type of process would need to be handled at a strategic level, the participant compared it to how provinces conduct their energy system planning.

Comparison of alternatives has been in assessment law since the American law in 1969 so it's not as if it's brand new, it's just that it's hard for proponents to think of things beyond what they do themselves and so usually a serious consideration of alternatives is done through some kind of public process with some public government involvement to look at the various options, and we look at various options, we do that in urban planning all the time, we do it in energy system planning n electricity in beautiful downtown Manitoba, you've done that with Manitoba Hydro and their system and whether they're going to build more stuff on the watersheds, whether they're going to export more stuff to the Americans. So it's not as if we haven't done that before, so I think the short answer is, we're going to have to do more strategic level assessments comparing options. –(Participant 3)

Strategic level comparison of alternatives 'to' seems to be a pragmatic solution for the issue of proponent led alternative analysis. Another participant raised a concern related to energy projects that may also require a strategic level solution. The concern stems from the fact the energy planning is a matter of provincial jurisdiction, and often they have decided on the kind of energy mix they want for their province long before any a project assessment takes place. The following quote is illustrative of the problem of current energy planning programs and how the ability for assessments to determine and dictate optimal energy solutions is hindered by delegation of energy planning to the provincial level.

So that's a tricky one for energy projects because energy policies are provincial jurisdiction. So for example, the province of Ontario, in the development of their energy policy we could probably comment and say whether it was well-done or not, but they did travel around the province, they consulted other energy policies and they came up through that consultation process with what they would say is a public informed energy mix which they're going to go forward with, and a part of that is to include nuclear. Then they come and apply, let's say for a new nuclear reactor, so the policy decision was already made and so when we look at the Alternatives in the EA, it doesn't really have the same sort of leverage then if energy policy were at the federal level for example. The province has already made the decision and our role as a regulator is to make sure at that facility is optimized, so we look at

alternatives in terms of how they do, how they would propose to do nuclear, but we wouldn't necessarily, and you know, the EA would include it, you know, what if they used oil, what if they use gas, or what if they built more windmills, but it's almost like a narrative as opposed to a quantitative analysis, and in the end it's not a federal responsibility to make that decision, the decisions already made provincially. So it's weakened because of that. It would still go through the motions and it's still part of the EA report and perhaps the impact assessment report in the future, but it doesn't have the same power that you would want it to have. –(Participant 13)

In developing a process for effectively considering alternatives 'to', it might be value adding to engage with provinces when they are planning their energy policies to see if their planning process includes consideration of alternatives from a climate change perspective, or if project level alternative assessments can feed upwards in to energy planning decisions at the strategic level.

5.6 Decision Making

One of the topics discussed with participants was regarding how final project decisions should be made, and further to that, how the decision maker would determine whether the project contributes to, or hinders, our progress towards our climate goals. Similar to the discussion of alternatives assessments, participants indicated that it was important to have decisions justified against criteria rooted in principles related to sustainability. This could be criteria specifically based in sustainability, the hinder vs. contribute distinction, or our Paris goals more broadly. These participants felt that the final project decisions needed to have a transparent justification against well-established criteria.

It's really hard, you know, that's kind of the million-dollar question, and I don't know if I have a really strong answer either way. I think whoever makes the decision we need to have very clear criteria that they have to apply to the project in order to approve it. Right, so whether we have an independent tribunal, whether we have cabinet or the Minister of Environment or a NRCAN, whoever, the Prime Minister himself can approve the project as long as the legislation sets out in making

framework that helps us ensure the project will only be approved if the proponent has adequately demonstrated that the project is consistent with our Paris obligations and our reduction targets under the Paris agreement. So there's some merit to an independent body making that decision, like it ostensibly depoliticizes the process, they may be a little less interested in how the public votes for example. –(Participant 2)

Yes, transparency is critical and it's not acceptable anymore for key people to go behind close doors and come out with the presto answer. I think it's incumbent upon those decision makers to lay out the basis on which they made their decision and make that public.–(Participant 16)

As to the specific criteria, one participant suggested that decisions be made through reference to sustainability criteria as set out in the literature regarding next generation EA (Gibson, Doelle, & Sinclair, 2016). Through applying a sustainability lens to decision making, we can address the requirement in the Impact Assessment Act to consider the projects contribution to sustainability.

So that for sustainability, applying a sustainability lens is particularly needed because climate change, yes there's immediate effects, but in many ways it is still very much protection of future generations, and by applying a sustainability assessment within EA law, then you are required to look at intergenerational effects and so that would be one way to get at the climate change question as a process and we're seeing that, there is a little bit of hope in bill C-69, there is a requirement that a project "contribution to sustainability" be measure, and although it's just a short line and it says you know, you have consider the contribution of the project to sustainability, sustainability when you unpack that, includes principles like the precautionary principle, polluter pays principle, intergenerational equity, and so that would be the way you get at climate change. –(Participant 11)

Other participants suggested EA decisions should be rooted in the Paris agreement but with the requirement that any approval of a project that is clearly non-compliant with Paris have a sufficient justification. One problem this participant noted was that often projects can be approved that are not in the best interests of our climate goals, but then

rationale for doing so is weak or how the government plans to offset their impact is vague and non-committal.

Of course, we would have preferred something that left less discretion, we would have preferred a climate factor that would actually require substantive compliance with the Paris agreement and our targets and all that stuff but that's not what we have, we just have the consideration of them. So it is still possible that a project that harms our climate change commitments goes forward with the government saying " ah don't worry, we'll compensate somewhere else in the economy", without there necessarily being a robust process for ensuring that we do compensate somewhere else. –(Participant 9)

This participant also eluded to the fact that they were displeased that in the Impact Assessment Act, the minister retained a significant amount of discretion to make final project decisions. On the subject of who should have the authority to make the final decisions, there was support for politicians to retain their discretion and there were participants who would have preferred to see authority move to an independent panel.

Those who supported the minister retaining power cited that it is ultimately a political decision whether a project should go forward or not, and the minister is the representative of the people given power through democracy. One participant expressed their view that it is also much simpler from an administrative perspective since spreading decision making power among all those with a stake in a project will very likely break the process all together.

I think it's 100% appropriate (ministerial decision making). There is no way that one could solve some of kind compensatory decision process where everybody who has an interest in a project has their hand on the tiller that would be thousands on the tiller and it would break rather than point in a consistent direction. –(Participant 16)

Another justification given for ministerial discretion over the final project decision was that for these types of decisions, they're often far more complicated than what we can expect an algorithm or scientifically designed set of criteria to help us solve.

I guess the other thing is, science isn't particularly helpful on these things. You are typically well beyond the kinds of useful generalizations that science can provide at this point. You're into predicting the future. You're into predicting the future of society and economics states, and you're way past the point where anything resembling science or technology is going to be the cutter on those things. You're purely into politics. –(Participant 17)

I don't think you could reduce it to a formula. I really think that, I understand where it comes from, but I don't think you could reduce it to that kind of mathematical formula of, you know, well, you know, you must need all threshold. You know, that kind of thing, I don't think it's, at least for mining project, it is mushy, it's much more mushy and a lot of the difficult issues are subjective, cultural community derived, they're not easily captured in those kinds of criteria. Um, and the more you pile on what sounds like objective criteria, the more you push it towards box ticking and frankly, lies –(Participant 8)

Those in support of ministerial discretion over project decisions seem to be insinuating that it's the best system for handling what they believe is, essentially, a political decision, and administratively it is the most expedient. Though what these responses seem to exclude is that decisions on political matters can and should be influenced heavily by scientific data, and there could be value in standardizing the way in which that data is reported and weighted in decision making.

Other participants expressed concern over the amount of discretion the minister maintained over project approval decisions. The proposed solutions to this ranged from legislating criteria to which decisions makers must justify their decisions to shifting authority to an independent body that is apolitical.

So what the gold standard model is for Canada now that we're not doing but we should be doing is, legislating really generic criteria or metrics that have to be applied in decision-making, but then also in the assessment identifying like, project-specific or assessment specific criteria that are relevant to that particular assessment or to the community and Indigenous needs of affected groups. So, it's only by applying this criteria that you know whether or not a project is actually, first of all going to help or hinder our ability to meet Paris, but then also if it's going to hurt a little bit, maybe not kill our ability but maybe it's not going to help, it might still be justified because, I don't know, it's helping in the broader transition or whatever. –(Participant 2)

Again, the idea of using criteria was mentioned but with the specific caveat that it is legislated that decision makers apply the criteria in making their decisions. Here the discussion of using criteria relates to more specific measures for holding the minister accountable to their decision under the section 63 of the Impact Assessment Act 2019. These criteria would have to be met in order to prove that the factors for consideration under section 63 have been sufficiently considered. Rather than using criteria, another participant mentioned using numeric emissions thresholds to structure how decisions are made.

I think what we need is really clear decision criteria that are based on, preferably, thresholds but a lot of thresholds we don't know where they are, so what you need to do is define what you think is a threshold using some degree of caution when you set it. And then what we need in the EA is good quantification of what we think the effect size will be so that it can be compared to those thresholds. –(Participant 12)

These participants seem to support a model that requires any decision to be justified against an agreed upon set of values, be they sustainability criteria or number representations of impact size.

One participant suggested that the power to make decisions be divorced entirely from politicians and embedded directly in the assessment process itself. When asked specifically what this would entail, they explained that the decision would come from the review panel in charge of overseeing the assessment.

one of the things I was very unhappy about was the fact that there was so much ministerial discretionary power still in the new act. Okay, so I would much for preferred to see the amount of ministerial involvement to be very minimal and to have most of the decision making actually reside in the assessment process itself... Any panel processes, the recommendations would in fact become enforceable (Participant 5).

Putting the decision in the hands of EA panels would ostensibly solve the issue of political ideology influencing the final project decision, but it would seem to open itself

up to new criticism regarding how the panels are selected and whether the panels member have the democratic authority to make such decisions.

5.7 Environmental Assessments as a GHG Mitigation Tool

One theme that emerge while conducting my interviews challenged the conceptualization of EA as a decision-making tool that should culminate in the yes or no approval of a project. Instead, participants suggested that EA should focus more on becoming a process for ensuring that proponents are using the best available technology for mitigating their GHG emissions.

My own view is that we should be operating not on an environmental assessment basis but on a best available technology bases for all new projects, that they should be seeking to absolutely minimize their CO2 or greenhouse gas emissions. –(Participant 12)

This participant spoke about how we need to get our emissions to net zero by mid-century, and the best way to do that would be to ensure all projects are pursued using the best technology from a mitigation standpoint. This would include using EA to prioritize renewables for energy projects since they are the best available technology from an emissions standpoint.

We're likely going to be at 11 billion by the end of the century, so there is going to be more development whether we like it or not, what we need is development that is not adding CO2 to the atmosphere which means finding other energy sources, be they solar, wind or hydrogen or nuclear, which is where we probably need to go in order to get, to be able to enable certain developments while we're minimizing our impact on CO2. –(Participant 12)

Along a similar line of thinking, another participant highlighted the fact that we already understand GHGs to be a serious environmental pollutant and we understand we need to minimize them by mid-century, but we should be considering whether EA is the best tool for this sort of mitigation. This participant suggested using a different act, possibly

one like the Canadian Environmental Protection Act 1999, to legislate GHG emissions in a similar manner to other environmental pollutants like selenium. The following quote is illustrative of the logic behind using another act to mitigate project emissions rather than just the Impact Assessment Act.

I guess my point related more to the reliance or the idea of relying on the impact assessment legislation as your tool, because I think that on the one hand the project list was well-thought-out in terms of identifying those sorts of projects that are controversial and really require public engagement to make sure that these are the kinds of projects that society needs or wants, you know, and look at the pros and cons. I think that's really what the impact assessment legislation is all about, but to apply it to something more like climate change I think you need another act, and we have one it's called the Canadian Environmental Protection Act 1999. If you look at that act as an example, you know, they made a determination recently that selenium is CEPA toxic, CEPA meaning the Canadian Environmental Protection Act, so if it's CEPA toxic then any industry whatsoever who releases selenium has to have a plan in place that's accepted that minimizes or eliminates that release. So if you could imagine, if you put that same sort of philosophy towards climate change, any industry out there that is releasing carbon must report and find ways to minimize that, and that would include existing industries, that would include new industries, so it's a general requirement and a process that already exists under another act. I think that would address emissions in general regardless of the discussion the impact Assessment Act might bring forward of that based on the pros and cons and the consultation indigenous, is this a project that we should go ahead with or not. It just seems to be the wrong tool to solve the problem we have. –(Participant 13)

This would require that proponents show that they are doing all they possibly can to minimize their GHG emissions, but it would extend beyond new projects and also enforce these requirements on existing projects which is where most of Canada's emissions are coming from.

This same participant suggested that a policy used in radiation mitigation could be useful if applied to carbon releases. The policy described was referred to as “ALARA”, as low as reasonably achievable.

We call it ALARA it means “as low as reasonably achievable”, and it's a requirement in law for radiation and the purpose of it is, ok, any individual activity may result in a radiation dose that is well below

regulatory and safe levels, nevertheless, there's a requirement for the industry to make it smaller, to minimize it. So they have to have a program in place that, regardless of the safe level, let's say the regulatory level was one and they're at 1% of that, they don't get a pass at that just because they're almost a hundred times below the limit, they have to have an active program in place that further optimizes their processes to minimize the dose. The same thing could be held for carbon releases in that, despite the fact that any particular facility is small, and it doesn't have a substantial impact, they have to minimize it and they have to demonstrate that they're minimizing it. And that's important because there's probably a million such facilities that are giving a small release but cumulatively it's a really big release. So, you know, I'm more talking about the kind of policies that could be put in place by governments, but I would see those be described in a strategic assessment and then looking at what those impacts would be, impacts both to industry but also on the reduced releases that would be a consequence of that. –(Participant 13)

What is interesting about an approach such as this is that it would capture all projects regardless of size. This would help mitigate the problem of smaller projects slipping under the thresholds of assessment. An approach to tackle this problem would be value adding since even small projects, in larger enough numbers, can have a significant impact if they are not held to science-based emissions standards.

5.8 Summary and Discussion

In this chapter I have presented results regarding some of the proposed ways my participants felt we could improve EA processes so that they more meaningfully consider a projects contribution to climate change. Many of the proposed ideas are interlinked and related back to barriers discussed in the previous chapter, so as I discuss the findings in this chapter, I will highlight those relationships where they exist. Also, as was evident in some of the data I presented above, views regarding the feasibility and usefulness of certain ideas discussed tended to change depending on participant background and I will make note of any topic that tended to diverge along that divide.

One of the first observations from this chapter is that participants strongly support more action at the strategic level to help interpret and understand the governments

specific intentions when it comes to addressing climate. Participants of all backgrounds spoke about the need for more instruction at the strategic level in terms of how climate EA policies reconcile to Canada's climate goals and its energy policy objectives. This theme is well discussed in the literature as well; much has been written on the need for strategic level planning to provide the overarching framework for how to approach important EA considerations such as how to interpret our climate obligations and cumulative effects at the project level (Gibson et al., 2019; Gibson, Doelle & Sinclair, 2016).

When thinking about how strategic assessment of climate change might be useful, participants identified applications both in terms of how it could be useful for improving the EA process, but also for structuring high-level policy decisions regarding Canada's approach to addressing climate change. This seems to reflect recent literature on the evolution of SEA thinking; SEA has historically been regarded from an EA perspective as tool for assessing policy, plans and programs (PPPs); however, Noble and Nwanekezie (2017) suggest that there has been shift towards understanding SEA as an approach for "better understanding of the complex institutional arena and governance conditions of strategic decision processes; ensures the creation and implementation of strategic actions that lead to more informed, and influential PPPs and development decisions; and facilitates strategic transitions toward more sustainable futures" (p.166). As it applies to my thinking here, both conceptualizations of SEA seem to have value. Participants suggest that we need strategic guidance on how to improve EA policies by informing how to contextualize emissions, how to perform adequate assessment of alternatives, and how to add projects to the project based on climate specific criteria. This objective would be more aligned with the traditional understanding of SEA as a process for assessing proposed or existing policies, plans or programs in order to understand their impacts and to facilitate better decision making to improve their effectiveness (Noble, 2000). But participant responses also indicate that there are many future oriented questions that need to be answered regarding how Canada charts a path forward towards its climate goals. Here, there is space for a different conceptualization of SEA. Noble and Nwanekezie (2017) have written about SEA based on "strategic transitions" that focuses less on PPPs and more on understanding how the

institutional environment, governance structures, and decision-making cultures set the conditions for success of strategic initiatives. The objective of this conceptualization of SEA is to understand the complexity of decision-making environments in order to facilitate innovation or changes to existing governance or decision-making cultures towards more sustainable outcomes (Partidario, 2015; Noble & Nwanekezie, 2017). Understanding SEA in this way, we can envision it as a useful tool for addressing some of the political and economic barriers discussed in Chapter 4. The information gathered from an SEA of this type could inform the development of a plan for Canada that would answer some of the biggest questions mentioned by participants, namely, how do we reconcile energy policy with climate policy and how do we move forward in light of the conflict embodied between them.

The SEA of climate change produced by ECCC in 2019 was an attempt at doing SEA, but fell short in many dimensions. There was no attempt to bridge the gap between our climate obligations and projects assessments in a way that clarified how the two are, or should be, connected. The SEA provided technical information on how to account for emissions, excluding downstream, and attempted to provide an emissions context (i.e. emissions intensity calculation) but this technical information does not solve the issue around linking our approach to EA with our broader goals in Paris or our transition to net zero emissions by 2050. The governments SEA of climate was also absent of answers to some higher order questions regarding how to interpret and bridge climate change policies within the context of project level decisions. The SEA does provide clear guidelines as to how decisions makers should undertake the decision regarding whether a project contributes to or hinders our climate change goals. Critics of the SEA suggest that there needs to be clearer instruction as to how projects demonstrate their compatibility with our plan for decarbonization by 2050, either through use of regularly maintained carbon budgeting reviews or some other reasonable standard for holding projects accountable to this goal (Johnston, 2020). The concern is that in the absence of these guidelines on decision making, there is no means for holding decision makers accountable to their project approval decision since there are no measures for objectively assessing the defensibility of a decision. This lack of transparency increases the likelihood that projects with a detrimental climate effect can

be approved and the public's ability to scrutinize and identify such instances is compromised by the lack of instruction as to what should be considered and how it should be weighted.

While some good has also come out of the SEA on climate, like the recommendation that projects with operational horizons beyond 2050 needing to show their compatibility with a decarbonized Canada, there are still large gaps in the short term as projects that end before 2050 are exempt from these requirements. This outcome seems to coincide with the literature in the political barriers section of this thesis, noting that politicians will seek to defer taking bold and risky policy maneuvers, instead preferring to delay action into the future. Results of the current SEA of climate seem to be indicative of measures that are lacking substance but designed to create the appearance of action on this issue. The government's SEA of climate also does not provide any guidance as to the direction it wants the country to move in with respect to its ideal future energy mix and how it will be incentivizing our move towards that end. Ideally, some sort of determination regarding whether Canada continues to support fossil fuel production or how it plans to shift its attention and funding to renewables would have been instrumental in beginning to undo some of the intractable conflicts playing out in project EA currently.

On the subject of contextualizing emissions, the responses I received from participants also depict a chain of interconnected issues surrounding emissions accounting. Broadly speaking, we need to determine which emissions should be attributed to a project, the standard of analysis and comparison for those emissions, and how the results of the analysis translate into a decision about whether the project hinders or contributes to our climate goals (Gibson et al. 2019). According to participants, we are currently stuck primarily debating on which emissions should be attributed to a project, and this was certainly reflected in the responses as participants from industry backgrounds were not supportive of inclusion of indirect downstream emissions, whereas those from academia or activism background were supportive. Based on participant responses, it seems that there is a legitimate debate to be had over whether downstream emissions outside of Canada should be attributed to projects.

Currently they are not included in the Impact Assessment Act 2019. Participants against inclusion mentioned that depending on how you perform the calculation and depending on the project, calculations of indirect downstream emissions can vary greatly. This seems to be supported in literature that mentions significant uncertainties as a characteristic of life cycle emissions accounting (Reijnders, 2017). The literature also suggests that greater transparency and disclosure should be encouraged regarding the relative uncertainty of indirect emissions calculations (Reijnders, 2017), and this seems to coincide with a response for one participant that suggested using uncertainty disclosures, similar to the IPCCs climate reports, for the purposes of emissions accounting.

Participants responses also diverged when it came to the topic of carbon budgets and how these might be utilized in EA. Participants with backgrounds in academia and activism were more likely to support carbon budgeting as a gold standard for how we could contextualize Canada's emissions whereas participants from industry were concerned with the practical complications of creating and allocating such a budget. However, regardless of whether carbon budgeting as a practice was supported or not, there was consensus around the belief that Canada's current political environment would make it almost impossible to implement and follow a carbon budget calibrated to the kinds of emissions reductions that we would need to make a meaningful reduction in our emissions. If this sentiment is accurate, and Canada is not politically welcoming to implementation of a strict carbon budgeting approach to curtailing emissions, the practice could still be valuable if used only to inform decision making. Carbon budgets can be useful for translating the language governments use to talk about emissions reductions, namely targets based on baseline emissions of a particular year (e.g. 17% reduction relative to 2005 levels), into more useable information in the form of emissions figures that can be further disaggregated into regions and sectors (Gage, 2015). A budgeting approach is also conducive to monitoring progress on a regular basis. Emissions reductions targets can be further distilled as budgeted emissions at specific time towards our final deadline, and progress can be tracked and compared along the way so that decision makers can better inform their decision making as we approach the final emissions reduction deadline (Gage, 2015). The responses from participants

with backgrounds in academia or activism acknowledged that while it is very unlikely that we will see enforceable carbon budgeting adopted in Canada, it is still useful as tool to inform EA decision making. Adopting carbon budgets as a method for informing EA decisions about projects could be helpful for alleviating one of the barriers mentioned in section 4.3. Emissions reduction targets could be translated in to budgeted emissions and then used as a standard of comparison for interpreting the significance of a projects emissions as part of an EA. So it is important to be clear about how the concept of carbon budgeting is interpreted; based on participant responses it seems that carbon budgets as a regulated limit on project emissions would be valuable but highly unlikely to ever receive the political support required to implement them. However, carbon budgets as informative processes for assessing projects seems like a more feasible possibility. They could provide a means for relating emissions data to higher level emissions targets if the process for disaggregating those targets to the project level is also sound and well justified.

From a decision-making point of view, a useful link was made by participants between carbon budgeting and decisions regarding how project classifications are added to the project list. Budgeting could help inform how we set the thresholds for emissions that should trigger an assessment. To paraphrase a response from Participant 3, without an appropriate understanding of the overall emissions reductions that we are working within, decisions become arbitrary and non-defensible. Using information gained from carbon budgeting, we could better inform the emissions-based threshold suggested by participants 2 and 9.

Another interesting link between themes in this section is that issues around both alternative assessment and decision making seem to stem from the absence of criteria based on shared values that structure the process for concluding on these matters. What immediately comes to mind is the literature that has been written on trade-off rules for governing sustainability decision making. Trade-off rules provide a framework for evaluating major decisions through a sustainability lens that seeks to elevate decisions that balance gains environmentally, socially and economically to create win-win outcomes (Morrison-Saunders & Pope, 2013; Gibson, 2013). Based on responses from

participants, it seems that it would be beneficial to incorporate trade-off focused criteria into decisions about how we evaluate alternatives and conclude on whether a project should be approved. Adopting sustainability focused criteria could address a number of the concerns brought up by participants such as lack of transparency and justification of decisions, and vague and unhelpful determinations of significance. Trade-off rules for sustainability require that decisions are explicitly justified, and the determination of significance is performed with sufficient rigor and holistic consideration of context (e.g., consideration that a small effect may be significant if an ecosystem is already stressed) (Gibson et al., 2013). Alternative assessment and decision-making criteria could therefore be improved with consideration of sustainability-based criteria.

Two participants had comments regarding whether EA, as it currently operates, is the best avenue for addressing emissions from projects. They suggested alternatives included changing the purpose of EA to ensure that all projects minimize emissions to their utmost potential or changing CEPA to designate emissions as toxic so that all emissions, both for new projects and existing ones, had to be strictly controlled. This idea is interesting since it would address the majority of emissions that come from projects already in operation. This type of approach is certainly something that would have to be worked out as part of an overarching strategy for addressing climate change at the national level. This leads to the final point of this discussion.

In trying to understand the interconnectedness of the issues identified in my thesis, one thought that emerged is that many of the barriers noted previously are symptomatic of a bigger issue, that Canada does not have a fulsome and detailed strategy for reaching its emissions reduction goals. This finding is supported by conclusion in the Auditor General of Canada's Report on 'Climate Change Action in Canada' which found that the plans of the Federal Government (and those of the Provinces) have been inconsistent, lacking in detail and without adequate guidance, funding or timelines (OAGC, 2018). Consequences of this they relate to EA are, to name a few, the intense conflict that emerges during controversial project assessments, the lack of context for emissions, arbitrary significance determinations, these all seem to have roots in gaps that are left at the strategic level. Based on what I have learned from

conversations with participants, and I have spoken about it in the discussion in section 4.3, moving forward at the strategic level would most beneficial use of time and resources if trying to improve the ability of EA to consider climate change. This is because the gaps left in this realm trickle down to specific areas of EA and leave a vacuum that is filled by conflict and confusion. It is important that high-level policy problems related to climate change such as, how our climate goals influence project EAs, how we reconcile energy policy with climate policy, the criteria we use to assess alternatives and conclude of projects, the context through which we interpret emissions figures, etc. are analyzed and specific direction is provided on how to move forward. All of the examples mentioned require at least some degree of top down direction that is derived from a fulsome understanding of what it would look like to adequately address climate change, beyond rhetoric or targets that are different to interpret at a concrete level. Alternatively, if we cannot expect more direction to emerge from strategic policy developments, then then project EA will need to adapt to fill the gaps. Adapting EA to fill the gaps left at the strategic level would involve implementing many of the proposed ideas in this paper such as using science-based carbon budgets to inform decisions, performing improved assessment of alternatives, using standardized emissions accounting methods and benchmarks tied to national targets, but further considerations will be required. In the absence of strategic direction, the project level process needs improve in terms of its ability to point us towards sustainable ends. This may include more rigorous discussion regarding the purpose of projects, the demands they are filling and value based consideration, in the context of our desired future goals on climate and the environment, of whether the project is worthwhile based on those ends.

6.0 Conclusion and Recommendations

I set out on my research to understand the barriers to, and implications of, developing meaningful EA legislation in Canada designed to address climate change, with a goal of contributing to an understanding of the complexities, contradictions, and conflicts embodied in trying to achieve this. In this chapter I draw conclusions around each of the objectives that I had set out at the inception of this project, which included:

- 1) To create an inventory of challenges and barriers to integrating meaningful climate change considerations in EA in Canada.
- 2) To determine the most effective policy approaches for considering climate change in EA.
- 3) To establish specific recommendations for the incorporation of climate change in federal environmental assessments given the findings of objectives 1 and 2.

The methods I applied to collect data to draw conclusions related to these objectives included reviewing literature, conducting interviews with experts, and analyzing the responses amongst each other and against the literature. Interview questions were first informed by an initial review of the literature and adapted if new information or questions emerged throughout the process. New participants were also approached as new themes emerged; one such theme was importance of politics in understanding barriers to climate change considerations in EA. This led me to contact experts in the politics of climate change in order to better understand this barrier. After transcribing my interviews, I analyzed the results and searched for related literature to compare the responses I received to what has already been written. The results of this analysis informed the conclusions that I have written below.

6.1 Barriers to Integrating Meaningful Climate Change Consideration in EA

6.1.1 Economics

The results of this research confirm that economic considerations should be considered a barrier to effective climate change-based EA. Economic considerations

are a barrier because they influence political decision making towards a less rigorous process for conducting climate change-based EA. This is reflected in participant responses which mention several sources of opposition to climate change-based EA that are rooted in economics.

One such source was the influence of economic inertia, which would prioritize the status quo and cater to existing industries. These existing industries that have high emissions also have a significant degree of influence over politicians, and that influence is and has been exerted in order to oppose strict climate change-based legislation. Part of economic inertia is the consideration that most of the economy still runs on fossil fuels, and the fossil fuel industry and those that support it are a significant portion of Canadian GDP at present (NRC, 2019). This all works against climate policies that are interpreted as impediments towards the continued success of this industry. One participant also stated that there is very strong relationship between fossil fuel use and GDP, and this seems to be supported in literature (Asafu-Adjaye, Byrne, & Alvarez, 2016). This strengthens barriers to climate change-based EA because of the perceived effect that it might have on GDP, and as I have discussed in previous sections, politicians are very concerned with economic performance. For the effect that economic inertia has on political decision makers, we can classify it as a barrier to meaningfully addressing climate change considerations through EA.

Arguments regarding the costs of rigorous climate change-based EA policies seem to be drawn from conclusions about the hypothetical effect they would have on high emitting industries. A more rigorous climate change-based EA is assumed to mean to less fossil fuel growth and development, which in turn would mean loss of jobs and tax revenue and a contraction of that industry. As shown in section 4.1.2, several participants referenced that there would be economic costs in implementing such changes, but there were also those that mentioned the opportunity costs of not acting fast enough or not transitioning towards development of renewable sources. As a result, this topic can be interpreted as a barrier or as a reason to act depending on the lens taken on the issue. It is difficult to find literature to support this possibility because it is hypothetical, but we can assume that there would be a decline in employment and

revenue from this sector. Natural Resource Canada (2019) reports that in 2018, there were 62,042 jobs directly related to oil and gas, and another 550,558 indirectly supporting the energy industry. There would therefore need to be planning for how to handle any loss of employment should climate change-based EA obviate the possibility of expanded fossil fuel development. It has also been widely noted that the renewable sector is forecasted to grow faster than any other energy source (IAE, 2019), so there is opportunity born out of any transition spurred on by climate change-based EA. For these reasons, it is difficult to classify costs of transition as a barrier to better climate change-based EA, but certainly the perception that there will be costs has an effect on belief about whether it is beneficial to make climate-based changes to EA.

On the matter of economic uncertainty as it relates to climate change-based EA, it is difficult to conclusively call this a barrier. If anything, this particular issue is a reason for the government to take action to make its intentions transparent as they relate to climate change and energy policy. The sentiment was shared by Don Lindsay, the CEO of Teck Resources Ltd. when writing the Minister to provide notification of the withdrawal of their application (Lindsay, 2020). The letter specifically mentions the need for a framework that reconciles resource development and climate change, and so alleviating this uncertainty seems more of a reason for action than a barrier.

International considerations are a relevant barrier for consideration. It was mentioned that often Canada is constrained by what the United States is doing from a regulatory perspective because we do not want to find ourselves too out of sync and no longer competitive with their industries. This seems to be supported in the literature which finds that there is material relationship between US and Canadian energy policy (Boyd, 2019). This barrier will therefore be difficult to address successfully from an entirely domestic perspective as it pertains to international relations.

Finally, the variation between provincial economies is a barrier because climate change focused policies will have greater or lesser cost depending on the extent to which that province is leveraged in high emitting industries. This creates winners and losers, and understandably, favorability towards climate change action is softest in provinces known for having large extractive industries such as Alberta and

Saskatchewan. This can explain sources of opposition to climate change-based EA and could tell us something interesting about what the kinds of solutions are required for finding a path forward on climate policy. This provincial variation seems to indicate that solutions need to be cognizant of provincial differences and the disparate effects felt by changes in policy. This is a barrier to climate change-based EA, but it also informs us of important considerations about how to structure our thinking around the development of future climate change policies.

In summary, the economic considerations that act as barriers to climate change are:

Economic Inertia – Forces that push us towards the status quo.

International Considerations – Pressure to maintain competitive against other countries and not move out of sync with US policy.

Provincial Variation – Differences in the economic make-up of the provinces are their attitudes towards climate change.

6.1.2 Politics

From the data gathered, there appears to be ample evidence to suggest that there are many barriers to achieving improved climate change-based EA laws that are political in nature. In this section I will conclude on some of the political barriers that the results of this research support. It is worth mentioning again that these barriers are beyond the scope of anything EA could reasonably hope to address, but the purpose of my research was to understand the barriers to EA reform and through this research, political considerations have been shown to be a significant barrier.

Overall, there are several structural features of our political system that we could justifiably call barriers to successfully incorporating climate change into EA. One such feature is the lack of accountability over longer terms and the incentive for governments to take actions that yield short term results. The nature of climate change positions it as a long-term issue with upfront costs and this works against the natural incentives of politicians. With election cycles occurring every 4 years there is an incentive to focus

efforts where results can easily be achieved and changes in government present a risk to climate policies that need to be sustained for many years. Politicians also tend to focus on the health of the economy over environment, and climate laws are seen as acting in opposition to economic goals, so again incentives for politicians become a barrier. Politicians are incentivized to seek reelection and our electoral system privileges appeals to the middle, so bold and transformative policies that would come from a stronger green party element are less likely to find themselves in positions of power. Literature supports the argument that climate change presents a barrier both because of the longer time frame, the requirement to upkeep mitigation efforts despite election cycles, and the incentives for politicians to prefer short term and less risky courses of action (Hovi, Sprinz, & Underdal, 2009). To tie in economic considerations, politicians are most incentivized towards policies where costs are spread widely and benefits are concentrated and the nature of climate change presents the exact opposite set of circumstances (Hovi, Sprinz, & Underdal, 2009). This all points to barriers related to the structure of our political system, both in terms of the time horizons and the incentives for politicians.

Canadian federalism also presents a barrier to moving forward with incorporating climate change in EA, and this ties into a previous discuss where I mentioned provincial variation as another barrier. Jurisdictional conflicts between the Federal Government and the Provinces are widely understood to be part of problem when devising climate policies at the national level. This is no different when it comes to incorporating climate change into federal EA. Provinces most opposed to changes to incorporate climate change are the heaviest emitters and constitutional challenges over the federal governments right to impede the provinces ability to develop its resources are in process (Munson, 2020); therefore, we can say that Canadian Federalism and provincial differences are a barrier to incorporating climate change in EA.

The strength of industry lobby group is another barrier. Participants responses have shown that they have greater access to politicians, and this was supported by data that shows the frequency of industry visits to high ranking government officials. This is barrier because often their objectives, specifically the objectives of oil and gas lobbies,

do not align with climate policies. As was seen with the recent reform of the Canadian Environmental Assessment Act 2012, the most challenging section to find consensus with industry was on the changes related to climate change. So, from this we can say that the power of industry to influence political decision making is certainly a barrier to incorporating climate change into EA.

Participants also frequently mentioned that lack of public understanding and misleading information contributed to insufficient support for climate change laws. I argue that is a barrier because only through electing politicians sympathetic to the need for stronger climate laws can we achieve a meaningful climate change-based EA, and if the general public lacks an sufficient understanding of the threat posed by climate change, we are less likely to have a government that prioritizes addressing that threat. Data also shows that despite increasing support for climate change action, many people are still opposed to having to pay more or make significant sacrifices in order to address the problem (Grenier, 2019). In addition to this, misleading information has been spread in attempt to strengthen opposition to reforms that would improve EA from a climate change perspective (Johnston, 2018). For these reasons, I argue that lack of public understanding and awareness of the climate problem facilitates choices among the public that favor economic outcomes over climate outcomes. In addition, misleading information increases polarization and opposition to measures that attempt to address climate change. Together, lack of understanding and misleading information prevents full appreciation of the problem and weakens support for climate change-based changes to EA.

Finally, political partisanship and ideology are a barrier to incorporating climate change in EA. Participants spoke specifically about how climate change has become a partisan issue, with right wing parties acting to oppose measures to meaningfully address the problem. Obviously then, in Canada, if a Conservative government were to win a majority, that would likely indicate that revising EA to incorporate climate change would not make any significant progress and perhaps be weakened instead. The leader of the Federal Conservative Party has spoken out in opposition to EA reforms as part of impact assessment act and so have his provincial counterparts, so we can reasonably

assume they have no intention of improving EA beyond what is already in the Impact Assessment Act 2019. One participant also spoke about how beliefs regarding the role of government also influence attitudes towards policy development. Those who believe the government should refrain from being interventionist will oppose measures to limit industrial activity born from changes to the EA process. So ideological challenges to EA also become a barrier to incorporating climate change-based considerations into EA. Moving forward, we can consider both increasing partisanship and small government ideologies to be barriers towards a reformed EA that meaningfully considers climate change.

So, in summary, political barriers include:

The Structure of our Political System – Electoral cycles and the incentives that drive political decision making.

Canadian Federalism – Disputes between the federal and provincial governments of the right to protect the environment versus develop resources.

Strength of Industry Lobbies – Lobbyists have greater access and influence over politicians than any environmental or citizens group.

Lack of Public Understanding – The general public does not appreciate the problem enough to make economic sacrifices to solve it.

Partisanship and Ideology – Climate change has become a partisan issue in Canada and certain ideological stances oppose interventionist government actions.

6.1.3 Implementation

After completing analyzing the data gathered, I have concluded that there are several implementation barriers to incorporating climate change in EA. Unlike the previous sections in this chapter, these barriers can be considered as problems through which changes to EA might provide possible solutions. These barriers were identified through analyzing participants responses and considering literature as it pertained to the themes that emerged in my discussions.

One type of barrier that emerged in this section is related to a lack of information or lack of instruction. Participants spoke about how the lack of context for projects emissions creates a situation whereby it is extremely difficult to interpret the relevance of emissions figures as they pertain to the criteria of hindering or contributing to our climate goals. This lack of instruction also exists in the context of project decision making since there are clear criteria for determining how climate factors influence the decision to approve a project. From a climate change perspective, this results in an ineffective process because practitioners are unsure of how to weigh the significance of emissions figures, and further to that, how much weight climate considerations like emissions will have in the decision-making process. Without proper context and criteria, the process is not grounded in any overarching strategy or logic, and therefore fails to produce consistent and useful results. For this reason, I can conclude that the lack of context for emissions and lack of instruction as to how climate considerations are weighted in decision making are barriers to meaningfully addressing climate change through EA.

Another type of barrier pertains to issues around who should perform certain tasks as part of EA and whether there are any independence issues. Alternatives assessments, as will be discussed in the subsequent section, are thought to be a useful part of EA, but there are concerns regarding who is best suited to perform this assessment. From the responses gathered, I conclude that proponent led alternatives assessment is insufficient for adequately assessing which projects represent the best alternative in terms of sustainability outcomes. The rationale being that “alternatives to” is too broad a category for a proponent, with their own practice specific expertise and experience, to properly consider in a fulsome manner. This is supported in literature which suggests that the better way to approach alternatives assessment would be an integrated approach with input from multiple stakeholders and early in the process while the project is still in the design phase (Geneletti, 2014). This is further supported by Gibson, Doelle, & Sinclair (2016), who advocate for greater participation of all stakeholders in the assessment of alternatives and engaging this process at an earlier and more strategic level of the EA process. Along with alternatives assessments, one participant also mentioned that having EA practitioners that are paid

by the proponent creates an independence issues because the practitioner will never publish anything that the proponent does not want them to. I tried to substantiate this by finding literature on the subject but was unable to find anything of relevance.

Theoretically this does present a conflict of interest, but I am reluctant to call this specific issue a barrier to successfully incorporating climate change without further evidence.

The final type of implementation barrier is related to a lack of instruction from the federal government on how it plans to reconcile it's climate and energy priorities and as part of this, the lack of forum for public discussion on how to address the issues that result from this conflict. I can conclude that this is barrier as participants mentioned it on several occasions and it seems to be the parent issues from which many other barriers written about in this thesis have emerged. Evidence supporting this conclusion, beyond participant responses, includes contemporary news reports of proponents withdrawing permits for projects citing this conflict for their withdrawal (Lindsay, 2020), and also the widely observed contradictory actions of the federal government that are inconsistent with our climate change goals, such as approving the Tek Frontier Expansion and Kitimat LNG facility and purchasing the Trans Mountain Pipeline.

In summary, the following implementation barrier were established:

Lack of Context for Emissions – Emissions figures from projects have no standard of comparison for interpreting their significance.

Lack of Clear Decision Criteria – There are no criteria through which climate considerations must be judged and applied to project decisions.

Improper Alternative Assessments – Proponents conduct alternative assessments but lack the broad spectrum of expertise and experience to conduct alternatives assessment in a meaningful way.

Conflicting Federal Energy and Climate Policy – Lack of instruction as to what the federal governments intentions are in reconciling key energy and climate decisions has left climate change EA without key instructions

6.2 Effective Policy Approaches for Considering Climate Change in EA

The second objective of this thesis was to conclude on the most effective policies approaches for considering climate change in EA. The policies discussed below are the most effective because together, they would improve the ability of the EA process to thoroughly identify, assess and conclude on the climate change contributions of proposed projects. The discussion in this section does not include consideration of the practical feasibility of the suggested approaches, this section focuses on the best ideas from the standpoint of assessing climate change.

One of the main conclusions from this research project is that there is a significant conflict at the strategic policy level when it comes to energy production and climate change. This unresolved conflict leads to confusion and ultimately undermines the effectiveness of the EA process. Ideally, the federal government would conduct a strategic assessment of how it should reconcile climate policy with energy policy. Strategic assessment, in this context, would be focused more towards future oriented planning and understanding of the complex institutional and governance challenges involved as described by Noble and Nwanekezie (2017). As part of this SEA process, important information could be gathered to help answer questions such as, can Canada continue to produce oil while also meeting its climate obligations? What is the carbon budget we are using to achieve our targets and what would that budget mean for future projects and industries? What support should be available for provinces and workers whose main source of economic prosperity comes from climate hazardous industries that cannot persist in light of a stricter approach on climate? What are some acceptable 'alternatives to' the heavy emitting projects that can no longer be sustained? And most importantly for this thesis, how does EA fit into and facilitate achievement of our overall climate change strategy? Essentially, this type of process would seek to lay out a path from our current situation towards a future where we have achieved our climate change goals and are successfully transitioning to net zero emissions by mid-century. Due to the complexity of this issue, as much investigation and detail and instruction as possible is necessary for path forward, and the goal of an SEA such as this would be to do provide that and fill the gaps between the high-level climate goals and the practical

realities of our current situation. This process should be periodically repeated and updated to reflect new information as this is a constantly evolving problem and the utility of the assessment depends on it accurately reflecting the circumstances of the time. Updating and reporting on our progress in a periodic manner is also another way of holding politicians accountable on time frame that matches their election cycles.

One deliverable of the SEA just mentioned should be some method of contextualizing emissions of projects. In order to make the best choices, we need an informed process for comparing the climate contributions of projects to determine the best option. I would argue that from a perspective that prioritizes climate change, a carbon budgeting is the strongest method for contextualizing emissions. Compared to other methods of analysis currently used in assessments, like comparing emissions to the national or provincial total, a carbon budget allows us to understand the emissions of a projects in a way that connects it to our overall future goals. One of the issues that emerged in my research was that there is no foundation that grounds the decisions we make about the significance of a projects climate change contribution and developing a carbon budget is one way to directly address this. Working backwards from our goals, the government should determine a carbon budget and periodically update it to reflect our progress or lack thereof. Additionally, this budget could be also be used to inform other climate policies like carbon prices and/or cap and trade limits.

Once a budget is established, a standardized process for the accounting of project emissions will be necessary. Comparisons of projects emissions can only be done fairly if the emission accounting of each project follows the same rules and accounts for all the emissions of each project. The government has already produced guidance as part of their SEA on how to account for project emissions but has left out consideration of downstream emissions (ECCC, 2017). From a climate change perspective, we should be considering all the emissions from a project, including those that emerge as the products of a project are consumed, and therefore they should be included in the assessment. The best practice would be to use a life cycle accounting approach to assessing emissions with disclosures of uncertainty levels for matters where it is not possible to obtain concrete date. Alternatively, if some emissions are not

to be accounted for and weighted in decision making, such as downstream emissions, there should be process for gathering the information or for explaining how those emissions are addressed through other policy mechanisms or confirmation that they are accounted for in other jurisdictions.

Having a consistent approach for the emissions that are accounted and weighted in the assessment process then allows us to better approach questions regarding which alternatives present the best possible outcome from a climate change perspective. One of the most effective policies for addressing climate change through EA would be to incorporate a fulsome assessment of the possible alternatives to the proposed project, including the null option. This assessment should not be conducted by the EA practitioner hired by the proponent, ideally it would be a participatory process involving feedback from multiple stakeholders and facilitated by an expert panel with expertise outside of the one industry represented by the proponent. The government will need to provide further guidance as to how alternatives should be identified and the criteria through which participants and panels should assess the alternatives proposed. This type of guidance is something that could be generated through the SEA process noted previously as it would require a high-level analysis of what suitable alternatives should be and what values will be applied to derive the criteria for the assessment. At the final stage of the EA process the Minister will decide whether the project should be approved. An alternative approach would be re-envisioning the process less as one of coming to a “yes or no” decision but rather one that seeks to pick the best option from a range of alternatives.

If the EA process persists based on a focus on approval decisions regarding one project, then the decision-making process should be revised. There government should develop clear criteria through which approval decisions must be justified against in order for a project to proceed. Again, these criteria would need to be derived from a higher order process like a strategic assessment. As it is now in the Act, there is a requirement that the minister consider whether a project hinders or contributes to our climate change goals, but there is no further guidance as to how this is to be understood in the context of assessment results. Moving forward, clear criteria need to be established so that it is

plainly understood how it is that a project is hindering or contributing to our climate goals. Project approval decisions would then need to be held against these criteria in order to be justified. This would improve both the clarity and transparency of the decision-making process.

To summarize, the best practices for incorporating climate change are:

- Conduct a future oriented SEA of Canada's climate change approach
- Develop a carbon budget that aligns with our plan for climate change and require consideration against the budget as part of project decision making
- Implement life cycle emissions accounting
- Conduct adequate independent assessment of alternatives from a climate change perspective
- Establish climate-based criteria for project decision making

6.3 Recommendations

In this section I establish a guide for the development of a frame for improving Federal EA to ensure that a climate change perspective is more meaningfully incorporated. In making these recommendations I have included what I have learned regarding the barriers and best practices of climate change in EA in order to draft an outline of the path forward and recommend the important considerations in developing a process for considering climate change in EA.

The first step in my framework would be to choose a climate objective. Based on my research I think this would ideally be the emissions reductions Canada agreed to under the Paris Climate Agreement, as this is the best objective currently in play. My findings suggest the importance of SEA, so a logical next step would be for government to conduct a thorough SEA of Canada's plan for achieving the Paris reduction objective. My participants noted the many benefits of doing an SEA in the climate context, which I have spoken about in the previous section and will not repeat here. In light the barriers identified, any SEA undertaken by the Federal government would need at least some

level of buy-in from the provinces, since while the Federal government could go it alone the politics of the climate issue noted in my findings and the transboundary nature of climate issues dictate the need for some cooperation within the federation. This is also supported but the fact that the main concern of many participants was related to economics, any strategic assessment should incorporate a degree of economic planning in terms of how to support the provinces and workers who stand to lose the most from action on climate change. In order to succeed politically, the government should be promoting the benefits of this undertaking or at the very least, working to combat countervailing narratives against the concept of strategic planning for a climate transition. To address issues around the lack of awareness and misinformation regarding climate, it is advisable that the process of SEA be open and transparent to the public and even encourage public participation. Literature shows that EA can be powerful tool for educating the public on issues related to sustainability, and the learning space provided by EA can help facilitate changes in perspective that could mobilize support for increased measures for addressing climate change (Sinclair, Diduck, & Fitzpatrick, 2008). Increased public awareness and support will be necessary for overcoming the barriers outlined in chapter 4.

In the absence of more direction from the strategic level, project EA needs to evolve to include a stronger and more standardized process for contextualizing our emissions. This process should be able to show how a projects emissions align with our climate goals. Moving from our current emissions to our reduced emissions objective in an incremental manner, detailing the reductions that are required each year to stay onside with reduction requirements. This is important because any framework for addressing climate change needs to have a method that ties activities in the present to a logic or plan that then ties into the final goal. As I have mentioned in the previous section, carbon budgeting would be an ideal method of doing this, however, as shown in chapter 4, there are many barriers that would stand in the way of being able to effectively produce a carbon budget for Canada. Considering this, at a minimum, Project EA should require a plan to show the emissions reductions required on a periodic basis with the important caveat that it is tied to scientific data regarding how it fits into a decarbonization by 2050 strategy. Any framework for addressing climate

change should include more specific reduction targets for industries, regions, sectors, etc. that can then help to inform project level EA processes, so it would benefit the entire process if disaggregated data was compiled and provided to EA practitioners to help them make informed judgements about how their projects align with our reduction strategy. Emissions figures from projects can then be compared to these disaggregated targets which helps bring important context to questions of whether a project hinders or contributes to our climate goals.

Once the context for emissions has been decided upon, a standardized approach for attributing emissions to a project should be developed and applied for all projects. I had written in the previous section that life-cycle emissions tracking would be ideal. This would involve tracking all emissions of a project, from cradle to grave, which would mean including upstream and downstream emissions. However, if the debate over including downstream emissions revealed in my findings and the literature (Prystupa, 2016; Thomson, 2018) is not resolved, and currently the government has no intention to include them (ECCC, 2019), options that exclude them will have to suffice. This should not mean that downstream emissions are not counted at all, rather we should still be attempting to quantify and attribute them where possible as it is not acceptable to just ignore these emissions. If they are not attributed directly to a specific project, we should still be using the information to inform the regularly occurring SEA process as these emissions will affect our reductions targets. There should be compensatory actions to offset these downstream emissions because the climate changes regardless of the jurisdiction in which the emissions occur.

With a standardized methodology for attributing emissions, a framework for a project EA can then include a uniform approach for performing alternatives analysis. Key to a successful alternative analysis will be ensuring that understand the right context of the emissions (reduction targets, etc.) so we can interpret their significance, and also a standardized emissions accounting methodology so that we know we are comparing like to like. In addition, effort should be put into identifying classes of projects and ranges of reasonable alternatives 'to' in order to focus the scope of the analysis on projects that have already been identified as acceptable alternatives. This will not

always be possible for every class of project, however it's a valuable exercise as we try to promote and look for opportunities for substitution of projects with more sustainable options. Identifying suitable alternatives for classes of projects also helps force a level of rigor on the process so that projects of certain classes are held to a minimum analysis of these suitable alternatives. Ideally, the analysis of alternatives 'to' should be taken out of the hands of the proponent paid consultants and delegated to regulatory body with independence so that the analysis is truly unbiased. This framework needs an unbiased analysis of the alternatives 'to' and a reasonable range of suitable alternatives for classes of projects. With respect to alternative 'means', projects should be held to the standard of using the best available technology from an emissions reduction standpoint barring some other trade off of environmental sustainability.

In addition to classes of projects for alternatives assessment, classes of projects with significant climate impacts should be determined for assessment triggering purposes. Projects known to have significant climate impacts should be included on the federal projects list for assessment. Emissions thresholds are one method of capturing projects based on their contribution to climate change, but care needs to be taken to ensure that proponents cannot scale their projects to fall underneath the emissions thresholds and avoid assessments by having multiple smaller projects. This leads to another point; the EA climate framework should include a methodology for capturing the effect of multiple smaller projects. One potential solution would be an auditing methodology, sampling smaller projects and a random basis to ensure that they are using the best available technology to complete their project and to assess whether the project is in the public interest. The framework should be sympathetic to the notion that we do not want to be overwhelming the system with assessments, however an approach to identifying and monitoring smaller projects for their overall cumulative effect on our climate goal should be developed. Information from these smaller projects, and from the assessment of the climate change impacts of other projects should also be fed upwards to inform the periodically occurring strategic assessment of our climate goals. This way there is a two-way flow of information from the strategically focused national perspective down to the project level and back up.

Eventually a decision will need to be made regarding the approval of a project. Section 63 of the Impact Assessment Act 2019 requires that there is consideration of whether a project hinders or contributes to our climate change goals. The framework should include criteria to help in this consideration because my findings indicate that there is insufficient guidance in order to make this determination. The project should prove that its emissions justifiably low against the context determined as part of the SEA. It should be the best available alternative against a range of identified alternatives 'to'. It should be using the best available technology. Additionally, it should have to show how its emissions over time fit into the projected emissions reduction strategy overtime, or how it facilitates a transition to more sustainable future despite emissions that would be otherwise too significant. Mostly importantly, the logic and information that supports how a project meets these criteria should be made public so that the minister can be held accountable to their decision. Key to maintaining public trust in the process is ensuring transparency of the decision-making process.

6.4 Areas for Further Discovery

One of the interesting thoughts that emerged while writing this thesis was the ideological dynamics at play when thinking about how EA could help shift Canadian industry towards a more sustainable future. Within EA, a conflict emerges between free market ideology and centralized planning. To reasonably address a problem like climate change seems to require an institution like government to engage in a degree of economic steering since the free market has not been able to show any significant progress in addressing climate change. In developing a framework for a climate change in EA, I can conceptualize it as a mechanism of moving free market processes, like proposing an investment in a major resource project, towards a more planned outcome. The conflicts discussed in chapter 4 are almost entirely revolving around this dynamic, and surely for some just the notion of any governmental involvement in planning the economy is entirely untenable, and it would be interesting to explore further how this has manifest in the opposition to climate change in EA.

I think more discovery could be done in terms of figuring out how to properly classify alternatives to projects. It's true that for some projects there will be no reasonable alternatives 'to'. If the goal is to mine a specific resource, like gold, another gold mine or no mine seems to be the only alternative. However, we can think about what kinds of substitutions make sense for other types of projects and begin trying to figure out what we can reasonably classify as an alternative 'to'. I'm not aware of any comprehensive endeavor to categorize projects in this way yet and it would seem to be a beneficial activity if we are to achieve an effective alternatives program.

Finally, it seems that a deeper investigation into how to find a collaborative space for Canada to develop and implement a regional or sectoral carbon budget is needed. One of the most significant challenges of developing a carbon budget for Canada would be finding common ground among the levels of government, so some investigation into figuring out the motivations of the provinces and trying to chart a path forward so that a carbon budget could be developed would be beneficial. It might be very unlikely that agreement could be reached but understanding what would motivate each stakeholder in the process could be helpful in trying to find common ground.

Another area for further work would be on the detailed components of a successful SEA of climate change. I discuss the need for a proper SEA at a higher level but work on exactly what would be needed from an economic planning perspective as well as determining and negotiating the proper carbon budgets or emissions framework to be used would be beneficial. Further exploration into the shortcomings of the governments SEA of climate change (2019) and how to develop and implement a more comprehensive of SEA in Canada is needed.

Works Cited

- ALBERTA GOVERNMENT. (2018). GROSS DOMESTIC PRODUCT AT BASIC PRICES (\$ BILLION). <HTTPS://ECONOMICDASHBOARD.ALBERTA.CA/GROSSDOMESTICPRODUCT#TY>
- ALTHEIDE, D., COYLE, M., DEVRIESE, K., & SCHNEIDER, C. (2010). CHAPTER 6: EMERGENT QUALITATIVE DOCUMENT ANALYSIS. HANDBOOK OF EMERGENT METHODS, (2008), 127–151.
- ARTHUR, W. B. (1994). INCREASING RETURNS AND PATH DEPENDENCE IN THE ECONOMY. ANN ARBOR: UNIVERSITY OF MICHIGAN PRESS.
- BACHE, I., BARTLE, I., FLINDERS, M., & MARSDEN, G. (2015). BLAME GAMES AND CLIMATE CHANGE: ACCOUNTABILITY, MULTI-LEVEL GOVERNANCE AND CARBON MANAGEMENT. BRITISH JOURNAL OF POLITICS AND INTERNATIONAL RELATIONS, 17(1), 64–88. <HTTPS://DOI.ORG/10.1111/1467-856X.12040>
- BLOOMER, C. EGAN, T. GARDNER, C. LEACH, G. MASTERSON, B. McMILLAN, T. WHALEN, T. ZATYLN, W. (2018). THIS LIBERAL BILL WILL HURT CANADA AND CANADIAN WORKERS. THE NATIONAL POST. <HTTPS://NATIONALPOST.COM/OPINION/THIS-LIBERAL-BILL-WILL-HURT-CANADA-AND-CANADIAN-WORKERS>
- BOND, A. J., MORRISON-SAUNDERS, A., & HOWITT, R. (2013). SUSTAINABILITY ASSESSMENT PLURALISM, PRACTICE AND PROGRESS. NEW YORK: ROUTLEDGE.
- CAMPBELL, K., & PEPPER-SMITH, K. (2016). ECOJUSTICE SUBMISSION TO THE EXPERT PANEL ON THE REVIEW OF ENVIRONMENTAL ASSESSMENT. RETRIEVED FEBRUARY 15, 2017 FROM: HTTP://EAREVIEW-EXAMENEE.CA/WP-CONTENT/UPLOADS/UPLOADED_FILES/DEC.12-13H25-KEGAN-PEPPER-SMITH-ECOJUSTICE-WRITTEN-SUBMISSION-CLIMATE-CHANGE.PDF
- CASHMORE, M., GWILLIAM, R., MORGAN, R., COBB, D., & BOND, A. (2004). THE INTERMINABLE ISSUE OF EFFECTIVENESS: SUBSTANTIVE PURPOSES, OUTCOMES AND RESEARCH CHALLENGES IN THE ADVANCEMENT OF ENVIRONMENTAL IMPACT ASSESSMENT THEORY. IMPACT ASSESSMENT AND PROJECT APPRAISAL, 22(4), 295–310. <HTTPS://DOI.ORG/10.3152/147154604781765860>
- CAYLEY-DAOUST, D., & GIRARD, R. (2012). BIG OIL 'S OILY GRASP CORRUPTING CANADIAN POLITICS. POLARIS INSTITUTE.
- CEAA (CANADIAN ENVIRONMENTAL ASSESSMENT AGENCY). (2017). BASICS OF ENVIRONMENTAL ASSESSMENT. RETRIEVED FROM <HTTPS://WWW.CANADA.CA/EN/ENVIRONMENTAL-ASSESSMENT-AGENCY/SERVICES/ENVIRONMENTAL-ASSESSMENTS/BASICS-ENVIRONMENTAL-ASSESSMENT.HTML#GEN02>

- CEAA (CANADIAN ENVIRONMENTAL ASSESSMENT AGENCY). (2012). CANADIAN ENVIRONMENTAL ASSESSMENT ACT 2012. RETRIEVED FROM [HTTP://LAWS-LOIS.JUSTICE.GC.CA/ENG/ACTS/C-15.21/PAGE-2.HTML#H-4](http://laws-lois.justice.gc.ca/eng/acts/C-15.21/page-2.html#h-4)
- COPE, M. (2005). CHAPTER 14: CODING QUALITATIVE DATA. IN I. HAY (ED.), QUALITATIVE RESEARCH METHODS IN HUMAN GEOGRAPHY (PP. 223 -233). OXFORD UNIVERSITY PRESS.
- GOVERNMENT OF CANADA. (2017). CANADA'S 2017 NATIONALLY DETERMINED CONTRIBUTIONS TO THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE.
- CRESWELL, J. W. (2014). CHAPTER 1: PRELIMINARY CONSIDERATIONS. IN RESEARCH DESIGN: QUALITATIVE, QUANTITATIVE, AND MIXED METHODS APPROACHES (PP. 1-21). LOS ANGELES: SAGE PUBLICATIONS.
- DEEMER, B. R., HARRISON, J. A., LI, S., BEAULIEU, J. J., DELSONTRO, T., BARROS, N., ... VONK, J. A. (2016). GREENHOUSE GAS EMISSIONS FROM RESERVOIR WATER SURFACES: A NEW GLOBAL SYNTHESIS MANUSCRIPT. *BIO SCIENCE*, 66(11), 949–964. [HTTPS://DOI.ORG/10.1093/BIOSCI/BIW117](https://doi.org/10.1093/biosci/biw117)
- DELOITTE. (2019). MAKING REGULATION A COMPETITIVE ADVANTAGE. [HTTPS://WWW2.DELOITTE.COM/CA/EN/PAGES/FINANCE/ARTICLES/CANADA-COMPETITIVENESS-SCORECARD.HTML](https://www2.deloitte.com/ca/en/pages/finance/articles/canada-competitiveness-scorecard.html)
- DOELLE, M. (2012). CEAA 2012: THE END OF FEDERAL EA AS WE KNOW IT? *JOURNAL OF ENVIRONMENTAL LAW AND PRACTICE*, 24(1), 1-17.
- DOELLE, M. (2016). INTEGRATING CLIMATE CHANGE INTO EA: THOUGHTS ON FEDERAL LAW REFORM AVAILABLE AT SSRN: [HTTPS://SSRN.COM/ABSTRACT=2854522](https://ssrn.com/abstract=2854522)
- DOELLE, M. (2008). THE FEDERAL ENVIRONMENTAL ASSESSMENT PROCESS: A GUIDE AND CRITIQUE. MARKHAM, ONT.: LEXISNEXIS CANADA.
- DUINKER, P. N., & GREIG, L. A. (2006). THE IMPOTENCE OF CUMULATIVE EFFECTS ASSESSMENT IN CANADA: AILMENTS AND IDEAS FOR REDEPLOYMENT. *ENVIRONMENTAL MANAGEMENT*, 37(2), 153–161. [HTTPS://DOI.ORG/10.1007/S00267-004-0240-](https://doi.org/10.1007/s00267-004-0240-)
- DUNN, K. (2005). CHAPTER 6: INTERVIEWING. IN I. HAY (ED.), QUALITATIVE RESEARCH METHODS IN HUMAN GEOGRAPHY (PP. 80 -103). OXFORD UNIVERSITY PRESS.
- EKINS, P., SIMON, S., DEUTSCH, L., FOLKE, C., & DE GROOT, R. (2003). A FRAMEWORK FOR THE PRACTICAL APPLICATION OF THE CONCEPTS OF CRITICAL NATURAL CAPITAL AND STRONG SUSTAINABILITY. *ECOLOGICAL ECONOMICS*, 44(2–3), 165–185. [HTTPS://DOI.ORG/10.1016/S0921-8009\(02\)00272-0](https://doi.org/10.1016/S0921-8009(02)00272-0)

- ELLIOT, J.K. (2019). WHY CRITICS FEAR BILL C-69 WILL BE A PIPELINE KILLER. GLOBAL NEWS. [HTTPS://GLOBALNEWS.CA/NEWS/5416659/WHAT-IS-BILL-C69-PIPELINES/](https://globalnews.ca/news/5416659/what-is-bill-c69-pipelines/)
- ENRÍQUEZ-DE-SALAMANCA, Á. (2018). STAKEHOLDERS MANIPULATION OF ENVIRONMENTAL IMPACT ASSESSMENT. ENVIRONMENTAL IMPACT ASSESSMENT REVIEW, 68, 10–18. DOI: 10.1016/J.EIAR.2017.10.003
- ENVIRONMENTAL ASSESSMENT EXPERT PANEL. (2017). EXPERT PANEL – REVIEW OF ENVIRONMENTAL ASSESSMENT PROCESSES. RETRIEVED FEBRUARY 24, 2017, FROM [HTTP://EAREVIEW-EXAMENEE.CA/WHAT-WEVE-HEARD/](http://eareview-examenec.ca/what-weve-heard/)
- ENVIRONMENT AND CLIMATE CHANGE CANADA (ECCC). (2015). NATIONAL INVENTORY REPORT 1990-2015: GREENHOUSE GAS SOURCES AND SINKS IN CANADA. CANADA'S SUBMISSION TO THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE PART 1. GATINEAU QC.
- ENVIRONMENT AND CLIMATE CHANGE CANADA (ECCC). (2016A). GREENHOUSE GAS EMISSIONS. RETRIEVED JANUARY 26, 2017, FROM [HTTPS://WWW.EC.GC.CA/INDICATEURS-INDICATORS/?LANG=EN&N=FBF8455E-1](https://www.ec.gc.ca/indicateurs-indicators/?lang=en&n=FBF8455E-1)
- ENVIRONMENT AND CLIMATE CHANGE CANADA (ECCC). (2016B). GREENHOUSE GAS EMISSIONS BY ECONOMIC SECTOR. RETRIEVED JANUARY 26, 2017, FROM [HTTP://WWW.EC.GC.CA/INDICATEURS-INDICATORS/DEFAULT.ASP?LANG=EN&N=F60DB708-1](http://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=F60DB708-1)
- ENVIRONMENT AND CLIMATE CHANGE CANADA (ECCC). (2019). STRATEGIC ASSESSMENT OF CLIMATE CHANGE. RETRIEVED MAY 17, 2020 FROM [HTTPS://WWW.CANADA.CA/CONTENT/DAM/ECCC/DOCUMENTS/PDF/SACC/DRAFT_STRATEGIC_ASSESSMENT_OF_CLIMATE_CHANGE.PDF](https://www.canada.ca/content/dam/eccc/documents/pdf/sacc/draft_strategic_assessment_of_climate_change.pdf)
- ENVIRONMENTAL PLANNING AND ASSESSMENT CAUCUS OF THE CANADIAN ENVIRONMENTAL NETWORK (EPA CAUCUS). (2016). ACHIEVING A NEXT GENERATION OF ENVIRONMENTAL ASSESSMENT. SUBMISSION TO THE EXPERT REVIEW OF FEDERAL ENVIRONMENTAL ASSESSMENT PROCESSES.
- ENVIRONMENTAL PROTECTION AGENCY (EPA). GREENHOUSE GASES EQUIVALENCIES CALCULATOR - CALCULATIONS AND REFERENCES. (2017, JANUARY 24). RETRIEVED MAY 05, 2017, FROM [HTTPS://WWW.EPA.GOV/ENERGY/GREENHOUSE-GASES-EQUIVALENCIES-CALCULATOR-CALCULATIONS-AND-REFERENCES](https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references)
- EU PARLIAMENT DIRECTIVE 2001/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL OF 27 JUNE 2001 ON THE ASSESSMENT OF THE EFFECTS OF CERTAIN PLANS AND PROGRAMMES ON THE ENVIRONMENT

- EXPERT PANEL ON ENVIRONMENTAL ASSESSMENT. (2017). BUILDING COMMON GROUND: A NEW VISION FOR IMPACT ASSESSMENT IN CANADA. THE FINAL REPORT OF THE EXPERT PANEL FOR THE REVIEW OF ENVIRONMENTAL ASSESSMENT PROCESSES.
- FOUQUET, R. (2016). PATH DEPENDENCE IN ENERGY SYSTEMS AND ECONOMIC DEVELOPMENT. NATURE ENERGY, 1(8), 16098. [HTTPS://DOI.ORG/10.1038/NENERGY.2016.98](https://doi.org/10.1038/nenergy.2016.98)
- GAGE, A. (2015). A CARBON BUDGET FOR CANADA: A COLLABORATIVE FRAMEWORK FOR FEDERAL AND PROVINCIAL CLIMATE LEADERSHIP. WEST COAST ENVIRONMENTAL LAW.
- GIBSON, R. B. (2013). AVOIDING SUSTAINABILITY TRADE-OFFS IN ENVIRONMENTAL ASSESSMENT. IMPACT ASSESSMENT AND PROJECT APPRAISAL, 31(1), 2–12. DOI: 10.1080/14615517.2013.764633
- GIBSON, R. B. (2016). SUSTAINABILITY ASSESSMENT: APPLICATIONS AND OPPORTUNITIES. NEW YORK: ROUTLEDGE.
- GIBSON, R. B. (2012). IN FULL RETREAT: THE CANADIAN GOVERNMENT'S NEW ENVIRONMENTAL ASSESSMENT LAW UNDOES DECADES OF PROGRESS. IMPACT ASSESSMENT AND PROJECT APPRAISAL, 30(3), 179–188. [HTTPS://DOI.ORG/10.1080/14615517.2012.720417](https://doi.org/10.1080/14615517.2012.720417)
- GIBSON, R. B. (2016). SUSTAINABILITY-BASED ASSESSMENT REQUIREMENTS, INCLUDING CRITERIA, FOR NEW FEDERAL ASSESSMENT LAW AND PROCESS. SUMMIT II DISCUSSION PAPER FOR SESSION 5: SUSTAINABILITY ASSESSMENT.
- GIBSON, R. B., PELOFFY, K., DOELLE, M., GREENFORD, D.H., MATTHEWS, H. D., HOLZ, C. STAPLES, K., WISEMAN, B., & GRENIER, F. (2019). FROM PARIS TO PROJECTS: CLARIFYING THE IMPLICATIONS OF CANADA'S CLIMATE CHANGE MITIGATION COMMITMENTS FOR THE PLANNING AND ASSESSMENT OF PROJECTS AND STRATEGIC UNDERTAKINGS – FULL REPORT (JANUARY 2019), 233PP.
- GIBSON, R. B., DOELLE, M., & SINCLAIR, A. J. (2016). FULFILLING THE PROMISE: BASIC COMPONENTS OF NEXT GENERATION ENVIRONMENTAL ASSESSMENT. JOURNAL OF ENVIRONMENTAL LAW AND PRACTICE, 29, 257-283.
- GIBSON, B., HASSAN, S., TANSEY, J., & WHITELAW, G. (2013). SUSTAINABILITY ASSESSMENT CRITERIA AND PROCESSES. ROUTLEDGE.
- GOVERNMENT OF CANADA. (2019). IMPACT ASSESSMENT ACT. [HTTPS://LAWS-LOIS.JUSTICE.GC.CA/ENG/ACTS/I-2.75/](https://laws-lois.justice.gc.ca/eng/acts/I-2.75/)
- GROSSMAN, G. M., & KRUEGER, A. B. (1995). ECONOMIC GROWTH AND THE ENVIRONMENT. QUARTERLY JOURNAL OF ECONOMICS, 110(MAY), 353–378. [HTTPS://DOI.ORG/10.3386/W4634](https://doi.org/10.3386/w4634)

- GUBER, D. L. (2003). THE GRASSROOTS OF A GREEN REVOLUTION: POLLING AMERICA ON THE ENVIRONMENT. CAMBRIDGE, MASS: THE MIT PRESS
- HAMIT-HAGGAR, M. (2012). GREENHOUSE GAS EMISSIONS, ENERGY CONSUMPTION AND ECONOMIC GROWTH: A PANEL COINTEGRATION ANALYSIS FROM CANADIAN INDUSTRIAL SECTOR PERSPECTIVE. ENERGY ECONOMICS, 34(1), 358–364.
[HTTPS://DOI.ORG/10.1016/J.ENECO.2011.06.005](https://doi.org/10.1016/j.eneco.2011.06.005)
- HANNA, K. (2015). ENVIRONMENTAL IMPACT ASSESSMENT: PRACTICE AND PARTICIPATION (3RD ED.). OXFORD UNIVERSITY PRESS.
- HARDISTY, P. E. (2010). ENVIRONMENTAL AND ECONOMIC SUSTAINABILITY. BOCA RATON: CRC PRESS/TAYLOR & FRANCIS.
- HARRISON, K. (2013). FEDERALISM AND CLIMATE POLICY INNOVATION: A CRITICAL REASSESSMENT. CANADIAN PUBLIC POLICY.
[HTTPS://DOI.ORG/10.3138/CP.39.SUPPLEMENT2.S95](https://doi.org/10.3138/cpp.39.supplement2.s95)
- HARRISON, K., & SUNDSTROM, L. M. (2010). CONCLUSION: THE COMPARATIVE POLITICS OF CLIMATE CHANGE. GLOBAL COMMONS, DOMESTIC DECISIONS: THE COMPARATIVE POLITICS OF CLIMATE CHANGE, 261-89.
- HOOD, C. (2010). THE BLAME GAME SPIN, BUREAUCRACY, AND SELF-PRESERVATION IN GOVERNMENT. PRINCETON UNIVERSITY PRESS.
- HOWLETT, M. (2014). WHY ARE POLICY INNOVATIONS RARE AND SO OFTEN NEGATIVE? BLAME AVOIDANCE AND PROBLEM DENIAL IN CLIMATE CHANGE POLICY-MAKING. GLOBAL ENVIRONMENTAL CHANGE, 29, 395–403.
[HTTPS://DOI.ORG/10.1016/J.GLOENVCHA.2013.12.009](https://doi.org/10.1016/j.gloenvcha.2013.12.009)
- HUANG, W. M., LEE, G. W. M., & WU, C. C. (2008). GHG EMISSIONS, GDP GROWTH AND THE KYOTO PROTOCOL: A REVISIT OF ENVIRONMENTAL KUZNETS CURVE HYPOTHESIS. ENERGY POLICY, 36(1), 239–247. [HTTPS://DOI.ORG/10.1016/J.ENPOL.2007.08.035](https://doi.org/10.1016/j.enpol.2007.08.035)
- IAIA & IEA (INTERNATIONAL ASSOCIATION FOR IMPACT ASSESSMENT & INSTITUTE OF ENVIRONMENTAL ASSESSMENT). (1999). PRINCIPLES OF ENVIRONMENTAL IMPACT ASSESSMENT, BEST PRACTICE. INTERNATIONAL ASSOCIATION FOR IMPACT ASSESSMEN, 1–4. RETRIEVED FROM
[HTTP://SCHOLAR.GOOGLE.COM/SCHOLAR?HL=EN&BTNG=SEARCH&Q=INTITLE:PRINCIPLES+OF+ENVIRONMENTAL+IMPACT+ASSESSMENT+BEST+PRACTICE#4](http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:principles+of+environmental+impact+assessment+best+practice#4)
- IMPACT ASSESSMENT AGENCY OF CANADA (IAA). 2019. POLICY CONTEXT: CONSIDERING ENVIRONMENTAL OBLIGATIONS AND COMMITMENTS IN RESPECT OF CLIMATE CHANGE UNDER THE IMPACT ASSESSMENT ACT. [HTTPS://WWW.CANADA.CA/EN/IMPACT-ASSESSMENT-AGENCY/SERVICES/POLICY-GUIDANCE/PRACTITIONERS-GUIDE-IMPACT-ASSESSMENT-ACT/CONSIDERING-ENVIRONMENTAL-OBLIGATIONS.HTML](https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/considering-environmental-obligations.html)

- INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC). (2014A). CLIMATE CHANGE 2014 SYNTHESIS REPORT SUMMARY CHAPTER FOR POLICYMAKERS. IPCC, 31. [HTTPS://DOI.ORG/10.1017/CBO9781107415324](https://doi.org/10.1017/CBO9781107415324)
- INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC). (2014B): SUMMARY FOR POLICYMAKERS. IN: CLIMATE CHANGE 2014: IMPACTS, ADAPTATION, AND VULNERABILITY. CAMBRIDGE UNIVERSITY PRESS, CAMBRIDGE, UNITED KINGDOM AND NEW YORK, NY, USA, PP. 1-32.
- JAY, S. (2010). STRATEGIC ENVIRONMENTAL ASSESSMENT FOR ENERGY PRODUCTION. ENERGY POLICY, 38(7), 3489–3497. DOI: 10.1016/J.ENPOL.2010.02.022
- JAY, S., JONES, C., SLINN, P., & WOOD, C. (2007). ENVIRONMENTAL IMPACT ASSESSMENT: RETROSPECT AND PROSPECT. ENVIRONMENTAL IMPACT ASSESSMENT REVIEW, 27(4), 287–300. [HTTPS://DOI.ORG/10.1016/J.EIAR.2006.12.001](https://doi.org/10.1016/J.EIAR.2006.12.001)
- JOHNSON, A. (2016A). TWELVE PILLARS OF A “NEXT GENERATION” OF CANADIAN ENVIRONMENTAL ASSESSMENT. RETRIEVED FEBRUARY 23, 2017, FROM [HTTP://WCEL.ORG/RESOURCES/ENVIRONMENTAL-LAW-ALERT/TWELVE-PILLARS-%E2%80%9CNEXT-GENERATION%E2%80%9D-CANADIAN-ENVIRONMENTAL-ASSESSMENT](http://wcel.org/resources/environmental-law-alert/twelve-pillars-%E2%80%9Cnext-generation%E2%80%9D-canadian-environmental-assessment)
- JOHNSTON, A. (2020). UPDATES TO STRATEGIC ASSESSMENT OF CLIMATE CHANGE WELCOME, BUT HUGE GAPS REMAINED. RETRIEVED AUGUST 30, 2020 FROM: [HTTP://EAREVIEW-EXAMENEE.CA/WP-CONTENT/UPLOADS/UPLOADED_FILES/WCEL-SUBMISSIONS-TO-EA-PANEL-FINAL-16-12-23.DOCX](http://eareview-examenee.ca/wp-content/uploads/uploads_uploaded_files/wcel-submissions-to-ea-panel-final-16-12-23.docx)
- JOHNSTON, A. (2016B). WEST COAST ENVIRONMENTAL LAW SUBMISSIONS ON NEXT GENERATION ENVIRONMENTAL ASSESSMENT. RETRIEVED FEBRUARY 15, 2017 FROM: [HTTPS://WWW.WCEL.ORG/MEDIA-RELEASE/UPDATES-STRATEGIC-ASSESSMENT-CLIMATE-CHANGE-WELCOME-HUGE-GAPS-REMAIN](https://www.wcel.org/media-release/updates-strategic-assessment-climate-change-welcome-huge-gaps-remain)
- JOSEPH, C. (2019). PROBLEMS AND RESOLUTIONS IN GHG IMPACT ASSESSMENT. IMPACT ASSESSMENT AND PROJECT APPRAISAL, 38(1), 83–86. DOI: 10.1080/14615517.2019.1625253
- KELLEY, C. P., MOHTADI, S., CANE, M. A., SEAGER, R., & KUSHNIR, Y. (2015). CLIMATE CHANGE IN THE FERTILE CRESCENT AND IMPLICATIONS OF THE RECENT SYRIAN DROUGHT. PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES, 112(11), 3241–3246. [HTTPS://DOI.ORG/10.1073/PNAS.1421533112](https://doi.org/10.1073/pnas.1421533112)
- KNETSCH, J. L. (2007). BIASED VALUATIONS, DAMAGE ASSESSMENTS, AND POLICY CHOICES: THE CHOICE OF MEASURE MATTERS. ECOLOGICAL ECONOMICS, 63(4), 684–689. [HTTPS://DOI.ORG/10.1016/J.ECOLECON.2007.02.012](https://doi.org/10.1016/J.ECOLECON.2007.02.012)

- LAVILLE, S. PEGG, D. (2019). FOSSIL FUEL FIRMS SOCIAL MEDIA FIGHT BACK AGAINST CLIMATE CHANGE. THE GAURDIAN.
[HTTPS://WWW.THEGUARDIAN.COM/ENVIRONMENT/2019/OCT/10/FOSSIL-FUEL-FIRMS-SOCIAL-MEDIA-FIGHTBACK-AGAINST-CLIMATE-ACTION](https://www.theguardian.com/environment/2019/oct/10/fossil-fuel-firms-social-media-fightback-against-climate-action)
- LEE, M., & CARD, A. (2011). PEDDLING GHGS: WHAT IS THE CARBON FOOTPRINT OF CANADA'S FOSSIL FUEL EXPORTS? CANADIAN CENTRE FOR POLICY ALTERNATIVES.
- LEE, M., & ELLIS, B. (2013). CANADA'S CARBON LIABILITIES THE IMPLICATIONS OF STRANDED FOSSIL FUEL ASSETS FOR FINANCIAL MARKETS AND PENSION FUNDS. RETRIEVED FROM
[HTTPS://WWW.POLICYALTERNATIVES.CA/SITES/DEFAULT/FILES/UPLOADS/PUBLICATIONS/NATIONAL OFFICE, BC OFFICE/2013/03/CANADAS CARBON LIABILITIES.PDF](https://www.policyalternatives.ca/sites/default/files/uploads/publications/national_office_bc_office/2013/03/canadas_carbon_liabilities.pdf)
- LEKNES, E. (2001). THE ROLES OF EIA IN THE DECISION-MAKING PROCESS. ENVIRONMENTAL IMPACT ASSESSMENT REVIEW, 21(4), 309–334. [HTTPS://DOI.ORG/10.1016/S0195-9255\(00\)00081-0](https://doi.org/10.1016/S0195-9255(00)00081-0)
- LE QUERE, C., MORIARTY, R., ANDREW, R. M., PETERS, G. P., CIAIS, P., FRIEDLINGSTEIN, P., ... ZENG, N. (2015). GLOBAL CARBON BUDGET 2014. EARTH SYSTEM SCIENCE DATA, 7(1), 47–85. [HTTPS://DOI.ORG/10.5194/ESSD-7-47-2015](https://doi.org/10.5194/essd-7-47-2015)
- LIAMPUTTONG, P. (2013). CHAPTER 10: QUALITATIVE CASE STUDY RESEARCH. IN QUALITATIVE RESEARCH METHODS (PP. 199- 2011). OXFORD UNIVERSITY PRESS.
- LONG, T., & JOHNSON, M. (2000). RIGOUR, RELIABILITY AND VALIDITY IN QUALITATIVE RESEARCH. CLINICAL EFFECTIVENESS IN NURSING, 4(1), 30-37.
 DOI:10.1054/CEIN.2000.0106
- MACINTOSH, A. (2010). BEST PRACTICE ENVIRONMENTAL IMPACT ASSESSMENT: A MODEL FRAMEWORK FOR AUSTRALIA. AUSTRALIAN JOURNAL OF PUBLIC ADMINISTRATION, 69(4), 401–417. [HTTPS://DOI.ORG/10.1111/J.1467-8500.2010.00703.X](https://doi.org/10.1111/j.1467-8500.2010.00703.x)
- MERRIAM, S. B., & TISELL, E. J. (2015). QUALITATIVE RESEARCH: A GUIDE TO DESIGN AND IMPLEMENTATION (4TH ED.). SAN FRANCISCO, CA: JOSSEY-BASS.
- MORRISON-SAUNDERS, A., & FISCHER, T. B. (2006). WHAT IS WRONG WITH EIA AND SEA ANYWAY? A SCEPTIC'S PERSPECTIVE ON SUSTAINABILITY ASSESSMENT. JOURNAL OF ENVIRONMENTAL ASSESSMENT POLICY AND MANAGEMENT, 8(1), 19–39.
[HTTPS://DOI.ORG/10.1142/S1464333206002372](https://doi.org/10.1142/S1464333206002372)
- MORRISON-SAUNDERS, A., & POPE, J. (2013). CONCEPTUALISING AND MANAGING TRADE-OFFS IN SUSTAINABILITY ASSESSMENT. ENVIRONMENTAL IMPACT ASSESSMENT REVIEW, 38, 54–63. DOI: 10.1016/j.eiar.2012.06.003

- MOUNIR BEN MBAREK, KAIS SAIDI & MOUNIRA AMAMRI. (2018). THE RELATIONSHIP BETWEEN POLLUTANT EMISSIONS, RENEWABLE ENERGY, NUCLEAR ENERGY AND GDP: EMPIRICAL EVIDENCE FROM 18 DEVELOPED AND DEVELOPING COUNTRIES, INTERNATIONAL JOURNAL OF SUSTAINABLE ENERGY, 37:6, 597-615, DOI: 10.1080/14786451.2017.1332060
- MOUTINHO, V., VARUM, C., & MADALENO, M. (2017). HOW ECONOMIC GROWTH AFFECTS EMISSIONS? AN INVESTIGATION OF THE ENVIRONMENTAL KUZNETS CURVE IN PORTUGUESE AND SPANISH ECONOMIC ACTIVITY SECTORS. ENERGY POLICY, 106(FEBRUARY), 326–344. [HTTPS://DOI.ORG/10.1016/J.ENPOL.2017.03.069](https://doi.org/10.1016/j.enpol.2017.03.069)
- NATURAL RESOURCES CANADA (NRC). (2016A). ENERGY FACT BOOK, 1–124. RETRIEVED FROM [HTTPS://WWW.NRCAN.GC.CA/SITES/WWW.NRCAN.GC.CA/FILES/ENERGY/FILES/PDF/ENERGYFACTBOOK2015-ENG_WEB.PDF](https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/energy/files/pdf/energyfactbook2015-eng_web.pdf)
- NATURAL RESOURCES CANADA (NRC). (2016B). ABOUT RENEWABLE ENERGY. (2016, JUNE 29). RETRIEVED MAY 11, 2017, FROM [HTTP://WWW.NRCAN.GC.CA/ENERGY/RENEWABLE-ELECTRICITY/7295](http://www.nrcan.gc.ca/energy/renewable-electricity/7295)
- NATURAL RESOURCES CANADA (NRC). (2016C). INTERIM MEASURES FOR PIPELINE REVIEWS. RETRIEVED AUGUST 01, 2017, FROM [HTTPS://WWW.CANADA.CA/EN/NATURAL-RESOURCES-CANADA/NEWS/2016/01/INTERIM-MEASURES-FOR-PIPELINE-REVIEWS.HTML](https://www.canada.ca/en/natural-resources-canada/news/2016/01/interim-measures-for-pipeline-reviews.html)
- NOBLE, B.F. (2000). STRATEGIC ENVIRONMENTAL ASSESSMENT: WHAT IS IT AND WHAT MAKES IT STRATEGIC? JOURNAL OF ENVIRON ASSESS POLICY MANAGEMENT 2 (2), 203–224
- NOBLE, B. F. (2009). PROMISE AND DISMAY: THE STATE OF STRATEGIC ENVIRONMENTAL ASSESSMENT SYSTEMS AND PRACTICES IN CANADA. ENVIRONMENTAL IMPACT ASSESSMENT REVIEW, 29(1), 66–75. [HTTPS://DOI.ORG/10.1016/J.EIAR.2008.05.004](https://doi.org/10.1016/j.eiar.2008.05.004)
- NOBLE, B. (2010). CUMULATIVE ENVIRONMENTAL EFFECTS AND THE TYRANNY OF SMALL DECISIONS: TOWARDS MEANINGFUL CUMULATIVE EFFECTS ASSESSMENT AND MANAGEMENT. PRINCE GEORGE, CA: NATURAL RESOURCES AND ENVIRONMENTAL STUDIES INSTITUTE, UNIVERSITY OF NORTHERN BRITISH COLUMBIA. RETRIEVED FROM [HTTP://WWW.EBRARY.COM.UML.IDM.OCLC.ORG](http://www.ebrary.com/uml.idm.oclc.org)
- NOBLE, B. F. (2015). INTRODUCTION TO ENVIRONMENTAL ASSESSMENT: A GUIDE TO PRINCIPLES AND PRACTICE (3RD ED). DON MILLS, ONT.: OXFORD UNIVERSITY PRESS.
- NOBLE, B., & NWANEKEZIE, K. (2017). CONCEPTUALIZING STRATEGIC ENVIRONMENTAL ASSESSMENT: PRINCIPLES, APPROACHES AND RESEARCH DIRECTIONS. ENVIRONMENTAL IMPACT ASSESSMENT REVIEW, 62, 165–173. DOI: 10.1016/j.eiar.2016.03.005
- NOVA SCOTIA ENVIRONMENT (2011). GUIDE TO CONSIDERING CLIMATE CHANGE IN PROJECT DEVELOPMENT IN NOVA SCOTIA (REP.). RETRIEVED MAY 8, 2017, FROM NOVA SCOTIA

ENVIRONMENT WEBSITE:

[HTTPS://NOVASCOTIA.CA/NSE/EA/DOCS/EA.CLIMATE.CHANGE.GUIDE.PDF](https://novascotia.ca/nse/ea/docs/ea.climate.change.guide.pdf)

OECD. (2008). CONDUCTING SUSTAINABILITY ASSESSMENTS. SUSTAINABLE DEVELOPMENT STUDIES. [HTTPS://DOI.ORG/10.1787/9789264047266-EN](https://doi.org/10.1787/9789264047266-en)

OFFICE OF THE AUDITOR GENERAL OF CANADA (OAGC). 2018. REPORT TO PARLIAMENT. PERSPECTIVES ON CLIMATE CHANGE ACTION IN CANADA – A COLLABORATIVE REPORT FROM AUDITORS GENERAL – MARCH 2018. [HTTP://WWW.OAG-BVG.GC.CA/INTERNET/ENGLISH/PARL_OTP_201803_E_42883.HTML](http://www.oag-bvg.gc.ca/internet/english/parl_otp_201803_e_42883.html)

ONTARIO MINISTRY OF THE ENVIRONMENT AND CLIMATE CHANGE (ONTARIO MECC). (2016). CONSIDERATION OF CLIMATE CHANGE IN ENVIRONMENTAL ASSESSMENT IN ONTARIO (REP.). RETRIEVED MAY 8, 2017, FROM [HTTP://WWW.ECOLOG.COM/DAILY_IMAGES/1003857166-1003857920.PDF](http://www.ecolog.com/daily_images/1003857166-1003857920.pdf)

OHSAWA, T., & DUINKER, P. (2014). CLIMATE-CHANGE MITIGATION IN CANADIAN ENVIRONMENTAL IMPACT ASSESSMENTS. *IMPACT ASSESSMENT AND PROJECT APPRAISAL*, 32(3), 222–233. DOI: 10.1080/14615517.2014.913761

PARIS, M. (2013). CBC. ENERGY INDUSTRY LETTER SUGGESTED ENVIRONMENTAL LAW CHANGES. RETRIEVED MAY 25, 2017, FROM [HTTP://WWW.CBC.CA/NEWS/POLITICS/ENERGY-INDUSTRY-LETTER-SUGGESTED-ENVIRONMENTAL-LAW-CHANGES-1.1346258](http://www.cbc.ca/news/politics/energy-industry-letter-suggested-environmental-law-changes-1.1346258)

PARTIDARIO, M. R. (2015). A STRATEGIC ADVOCACY ROLE IN SEA FOR SUSTAINABILITY. *JOURNAL OF ENVIRONMENTAL ASSESSMENT POLICY AND MANAGEMENT*, 17(01), 1550015. DOI: 10.1142/s1464333215500155

PRYSTUPA, M. (2016). PIPELINE REFORMS GREAT STEP BUT DON'T ACCOUNT FOR MOST EMISSIONS, SAY CLIMATE CRITICS. *THE TYEE*. [HTTPS://THETYEE.CA/NEWS/2016/01/28/PIPELINE-REFORMS-DOWNSTREAM-IMPACTS/](https://thetyee.ca/news/2016/01/28/pipeline-reforms-downstream-impacts/)

REIJNDERS L. (2017) LIFE CYCLE ASSESSMENT OF GREENHOUSE GAS EMISSIONS. IN: CHEN WY., SUZUKI T., LACKNER M. (EDS) *HANDBOOK OF CLIMATE CHANGE MITIGATION AND ADAPTATION*. SPRINGER, CHAM

RILEY, S. (2019, JULY 26). 10 THINGS YOU NEED TO KNOW ABOUT THE MASSIVE NEW OILSANDS MINE THAT JUST GOT A GREEN LIGHT. *THE NARWHAL*. RETRIEVED FROM [HTTPS://THENARWHAL.CA/10-THINGS-YOU-NEED-TO-KNOW-ABOUT-THE-MASSIVE-NEW-OILSANDS-MINE-THAT-JUST-GOT-A-GREEN-LIGHT/](https://thenarwhal.ca/10-things-you-need-to-know-about-the-massive-new-oilsands-mine-that-just-got-a-green-light/)

ROGELJ, J., SCHAEFFER, M., FRIEDLINGSTEIN, P., GILLETT, N. P., VAN VUUREN, D. P., RIAHI, K., ... KNUTTI, R. (2016). DIFFERENCES BETWEEN CARBON BUDGET ESTIMATES UNRAVELLED. *NATURE CLIMATE CHANGE*, 6(3), 245–252. [HTTPS://DOI.ORG/10.1038/NCLIMATE2868](https://doi.org/10.1038/nclimate2868)

- ROSENBERG, D. M., BERKES, F., BODALY, R. A., HECKY, R. E., KELLY, C. A., & RUDD, J. W. M. (1997). LARGE-SCALE IMPACTS OF HYDROELECTRIC DEVELOPMENT. ENVIRONMENTAL REVIEWS, 5(1), 27–54. [HTTPS://DOI.ORG/10.1139/ER-5-1-27](https://doi.org/10.1139/ER-5-1-27)
- ROZEMA, J. G., BOND, A. J., CASHMORE, M., & CHILVERS, J. (2012). AN INVESTIGATION OF ENVIRONMENTAL AND SUSTAINABILITY DISCOURSES ASSOCIATED WITH THE SUBSTANTIVE PURPOSES OF ENVIRONMENTAL ASSESSMENT. ENVIRONMENTAL IMPACT ASSESSMENT REVIEW, 33(1), 80–90. [HTTPS://DOI.ORG/10.1016/J.EIAR.2011.11.003](https://doi.org/10.1016/J.EIAR.2011.11.003)
- SADLER, B. (1996). ENVIRONMENTAL ASSESSMENT IN A CHANGING WORLD: EVALUATING PRACTICE TO IMPROVE PERFORMANCE: FINAL REPORT. OTTAWA, ONT.: MINISTER OF SUPPLY AND SERVICES CANADA.
- SAITO, Y., GATTUSO, J.P, HINKEL, J., KHATTABI, A., MCINNES, K. L. & SALLENGER, A. (2013). CHAPTER 5: COASTAL SYSTEMS AND LOW-LYING AREAS. CLIMATE CHANGE 2014: IMPACTS, ADAPTATION, AND VULNERABILITY. PART A: GLOBAL AND SECTORAL ASPECTS. CONTRIBUTION OF WORKING GROUP II TO THE FIFTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, (OCTOBER 2013), 1–85. [HTTPS://DOI.ORG/10.1017/CBO9781107415379.010](https://doi.org/10.1017/CBO9781107415379.010)
- SCHOR, J. B. (2014). CLIMATE DISCOURSE AND ECONOMIC DOWNTURNS: THE CASE OF THE UNITED STATES, 2008-2013. ENVIRONMENTAL INNOVATION AND SOCIETAL TRANSITIONS, 13, 6–20. [HTTPS://DOI.ORG/10.1016/J.EIST.2014.04.006](https://doi.org/10.1016/J.EIST.2014.04.006)
- SCRUGGS, L., & BENEGAL, S. (2012). DECLINING PUBLIC CONCERN ABOUT CLIMATE CHANGE: CAN WE BLAME THE GREAT RECESSION? GLOBAL ENVIRONMENTAL CHANGE, 22(2), 505–515. [HTTPS://DOI.ORG/10.1016/J.GLOENVCHA.2012.01.002](https://doi.org/10.1016/J.GLOENVCHA.2012.01.002)
- SELDEN, T. M., & SONG, D. (1994). ENVIRONMENTAL QUALITY AND DEVELOPMENT: IS THERE A KUZNETS CURVE FOR AIR POLLUTION EMISSIONS? JOURNAL OF ENVIRONMENTAL ECONOMICS AND MANAGEMENT. [HTTPS://DOI.ORG/10.1006/JEEM.1994.1031](https://doi.org/10.1006/JEEM.1994.1031)
- SINCLAIR, A. J., DIDUCK, A., & FITZPATRICK, P. (2008). CONCEPTUALIZING LEARNING FOR SUSTAINABILITY THROUGH ENVIRONMENTAL ASSESSMENT: CRITICAL REFLECTIONS ON 15 YEARS OF RESEARCH. ENVIRONMENTAL IMPACT ASSESSMENT REVIEW, 28(7), 415–428. DOI: 10.1016/J.EIAR.2007.11.001
- SINCLAIR, J. & DOELLE, M. (2004). ENVIRONMENTAL ASSESSMENT IN CANADA: ENCOURAGING DECISIONS FOR SUSTAINABILITY. IN B. MITCHELL (ED.), RESOURCE AND ENVIRONMENTAL MANAGEMENT IN CANADA: ADDRESSING CONFLICT AND UNCERTAINTY (FORUETH EDITION, PP.462 – 490). OXFORD UNIVERSITY PRESS.
- SINCLAIR, A. J., DOELLE, M., & DUINKER, P. N. (2017). LOOKING UP, DOWN, AND SIDEWAYS: RECONCEIVING CUMULATIVE EFFECTS ASSESSMENT AS A MINDSET. ENVIRONMENTAL

IMPACT ASSESSMENT REVIEW, (62), 183–194.
[HTTPS://DOI.ORG/HTTP://DX.DOI.ORG/10.1016/J.EIAR.2016.04.007](https://doi.org/http://dx.doi.org/10.1016/j.eiar.2016.04.007)

SMITH, K. R., WOODWARD, A., CAMPBELL-LENDRUM, D., CHADEE, D., HONDA, Y., LIU, Q., ... GENOVA, R. (2014). HUMAN HEALTH: IMPACTS, ADAPTATION, AND CO-BENEFITS. CLIMATE CHANGE 2014: IMPACTS, ADAPTATION, AND VULNERABILITY. PART A: GLOBAL AND SECTORAL ASPECTS. CONTRIBUTION OF WORKING GROUP II TO THE FIFTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE [FIELD CB, BARROS VR, DOKKEN DJ, MACH KJ, MA, 709–754.
[HTTPS://DOI.ORG/10.1017/CBO9781107415379.016](https://doi.org/10.1017/CBO9781107415379.016)

SMYTH, C. E., STINSON, G., NEILSON, E., LEMPRIÈRE, T. C., HAFFER, M., RAMPLEY, G. J., & KURZ, W. A. (2014). QUANTIFYING THE BIOPHYSICAL CLIMATE CHANGE MITIGATION POTENTIAL OF CANADA'S FOREST SECTOR. BIOGEOSCIENCES, 11(13), 3515–3529.
[HTTPS://DOI.ORG/10.5194/BG-11-3515-2014](https://doi.org/10.5194/bg-11-3515-2014)

STEINEMANN, A. (2001). IMPROVING ALTERNATIVES FOR ENVIRONMENTAL IMPACT ASSESSMENT. ENVIRONMENTAL IMPACT ASSESSMENT REVIEW, 21(1), 3–21. DOI: 10.1016/S0195-9255(00)00075-5

STERN N. (2015). ECONOMIC DEVELOPMENT, CLIMATE AND VALUES: MAKING POLICY. PROCEEDINGS. BIOLOGICAL SCIENCES, 282(1812), 20150820.
[HTTPS://DOI.ORG/10.1098/RSPB.2015.0820](https://doi.org/10.1098/rspb.2015.0820)

TALBOT, D., & BOIRAL, O. (2014). STRATEGIES FOR CLIMATE CHANGE AND IMPRESSION MANAGEMENT: A CASE STUDY AMONG CANADA'S LARGE INDUSTRIAL EMITTERS. JOURNAL OF BUSINESS ETHICS, 132(2), 329–346. DOI: 10.1007/s10551-014-2322-5

TASKER, J. P. (2016). TRUDEAU CABINET APPROVES TRANS MOUNTAIN, LINE 3 PIPELINES, REJECTS NORTHERN GATEWAY. RETRIEVED JULY 05, 2017, FROM [HTTP://WWW.CBC.CA/NEWS/POLITICS/FEDERAL-CABINET-TRUDEAU-PIPELINE-DECISIONS-1.3872828](http://www.cbc.ca/news/politics/federal-cabinet-trudeau-pipeline-decisions-1.3872828)

TASKER, J. P. (2020). NOW THAT TECK FRONTIER IS DEAD, IS THERE A FUTURE FOR CANADA'S OILSANDS? | CBC NEWS. RETRIEVED FROM [HTTPS://WWW.CBC.CA/NEWS/POLITICS/TASKER-TECK-FRONTIER-FUTURE-OILSANDS-1.5475658](https://www.cbc.ca/news/politics/tasker-teck-frontier-future-oilsands-1.5475658)

THOMSON, S. (2018). SO YOU THINK CORPORATIONS ARE RESPONSIBLE FOR THE WORLD'S EMISSIONS? IT'S NOT THAT SIMPLE. THE NATIONAL POST.
[HTTPS://NATIONALPOST.COM/NEWS/POLITICS/SO-YOU-THINK-CORPORATIONS-ARE-RESPONSIBLE-FOR-THE-WORLDS-EMISSIONS-ITS-NOT-THAT-SIMPLE](https://nationalpost.com/news/politics/so-you-think-corporations-are-responsible-for-the-worlds-emissions-its-not-that-simple)

- TIETENBERG, T., & LEWIS, LYNNE. (2012). ENVIRONMENTAL & NATURAL RESOURCE ECONOMICS (9TH ED., PEARSON SERIES IN ECONOMICS). UPPER SADDLE RIVER, N.J.: PEARSON EDUCATION.
- TORONTO STOCK EXCHANGE (TSX). (2017). ENERGY & ENERGY SERVICES. RETRIEVED MAY 19, 2017, FROM [HTTPS://WWW.TSX.COM/LISTINGS/LISTING-WITH-US/SECTOR-AND-PRODUCT-PROFILES/ENERGY-AND-ENERGY-SERVICES](https://www.tsx.com/listings/listing-with-us/sector-and-product-profiles/energy-and-energy-services)
- TRANSPORT & ENVIRONMENT. (2017). EU CLIMATE LEADER BOARD: WHERE COUNTRIES STAND ON THEIR EFFORT SHARING REGULATION – POLICY BRIEFING, MARCH 2017.
- UNRUH, G. C. (2002). UNDERSTANDING CARBON LOCK-IN. ENERGY POLICY, 30(4), 317–325. [HTTPS://DOI.ORG/10.1016/S0301-4215\(01\)00098-2](https://doi.org/10.1016/S0301-4215(01)00098-2)
- WEAVER, R. K. (1986). THE POLITICS OF BLAME AVOIDANCE. JOURNAL OF PUBLIC POLICY, 6(4), 371. [HTTPS://DOI.ORG/10.1017/S0143814X00004219](https://doi.org/10.1017/S0143814X00004219)
- WORLD BANK. (2016). CO2 EMISSIONS: METRIC TONS PER CAPITA. RETRIEVED JAN 26, 2017 FROM: [HTTP://DATA.WORLDBANK.ORG/INDICATOR/EN.ATM.CO2E.PC](http://data.worldbank.org/indicator/EN.ATM.CO2E.PC)
- WORRELL, E., PRICE, L., MARTIN, N., HENDRIKS, C., & MEIDA, L. O. (2001). CARBON DIOXIDE EMISSIONS FROM THE GLOBAL CEMENT INDUSTRY. ANNUAL REVIEW OF ENERGY AND THE ENVIRONMENT, 26, 303–329. [HTTPS://DOI.ORG/10.1146/ANNUREV.ENERGY.26.1.303](https://doi.org/10.1146/annurev.energy.26.1.303)
- WRIGHT, D., & DOELLE, M. (2019). SOCIAL COST OF CARBON IN ENVIRONMENTAL IMPACT ASSESSMENT. SSRN ELECTRONIC JOURNAL. DOI: 10.2139/ssrn.3332755

Appendix A - Draft Interview Questions

Introduction & Participant Background

1. Can you tell me about your professional background in EA, where you have worked, notable projects?
Can you speak a bit about issues that have interested you most about EA in Canada over the years?

Generalized EA Reform Questions

2. Broadly, how would you describe the appropriate scope of a revised Federal EA program? (e.g. types of assessment, projects that should be assessed, and the impacts considered).
3. In terms of the EA process, at what point do you see climate change assessments taking place?
4. Are there any specific processes or guidelines that would need to be in place to form an effective climate change based EA? (e.g. how to measure GHG, standards of what's measured)
5. Are there any specific practices that stand out in your mind as crucial for an effective Climate Change EA Process?

EA/SEA/REA

6. Do you see climate change assessments taking place within one form of EA (SEA/REA/Project) or as a multitude of processes that span across different scales of EA?
 - a. Follow up: Can you describe how you envision climate change assessment as a linked process between different forms of EA?
7. What criteria should be used to trigger a climate change based assessment? Should it be based on project qualities (e.g. contribution to decarbonization), a project list, or something done for every project within a region?
8. What kind of climate considerations should be examined or determined at each tier of EA? (e.g. carbon budget at strategic level? regional?)

Emissions Tracking

9. With respect to individual projects, are there any emissions sources that should not be included within climate change EA?
10. What is the best way to assess direct and indirect emissions of a project? Is this a process that could be easily worked into EA procedure?
11. How should a climate assessment consider projects that are GHG intensive, but facilitate the development of renewable infrastructure? (e.g. O&G providing energy to build wind turbines).

12. How does the decision to include or exclude upstream and/or downstream emissions influence the rigorousness of climate change EA policy?

Thresholds/Carbon Budgeting

13. The Expert Panel had mentioned that one of the common suggestions of participants to their consultation was the creation of carbon budgets or thresholds, what are your thoughts on this idea and its feasibility?
14. What do you see as the best way of determining a carbon budget for Canada? For specific regions?
15. Once a budget is determined, who should determine which projects fit into the budget?
16. Even the most lenient carbon budgets require Canada to make dramatic cuts in our emissions; do you think EA policy can effectively enforce the limitations?

Legislative Requirements of Climate Change EA

17. What kind of legislative results would we need to see from the EA reform process to ensure that climate change based EA is effective?
18. What should the federal government require from provincial jurisdictions when addressing climate change through EA?
19. What kind of enforcement mechanisms should be in place for projects that violate the terms of an assessment used to approve a project? (e.g. real emissions in egregious excess of what was projected in the assessment)

Political or Economic Challenges

20. With respect to carbon budgets, how should we prioritize the most appropriate projects for climate assessment and what kind of challenges would you foresee when making these kinds of determination?
21. Do you think that legislative changes to EA are especially vulnerable to shifts in political power due to the polarization of climate change?
22. GHG intensive industries, like oil & gas, make up a significant proportion of the Canadian economy, do you foresee any economic challenges resulting from climate change assessments?
23. Do you foresee any political challenges in trying to coordinate a multijurisdictional solution to a problem like climate change that transcends all jurisdictions and is trans-boundary by nature?
24. Do you think that the Impact Assessment Agency will be an effective institution for implementing climate change based EA policies or are there any critiques of having a centralized authority?

General Comments

25. When thinking about the best way to incorporate climate change considerations into EA, do you have any specific recommendations or concerns that we've yet to discuss (or any comments on this survey)?
26. Can you think of any other challenges, that we haven't already mentioned, that might be encountered when implanting these changes?

Appendix B – Final Participant Categories

Background	Number of Participants
Environmental Academic	3
Environmental NGO	4
Environmental Assessment	2
Industry Representative	3
Political Science	4
Government Regulator	2
TOTAL	18

Appendix C – Example Consent Form



Research Project Title: Understanding the Need for and Implications of Climate Change Based Environmental Assessment in Canada

Principal Investigator: Scott Newall – 204-XXX-XXXX – umnewals@myumanitoba.ca

Research Supervisor: Dr. John Sinclair - 204-474-8374 - John.Sinclair@umanitoba.ca

This consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

The Federal Government is in the process of reforming the Canadian Environmental Assessment Act. Part of this reform includes considering how to incorporate climate change concerns into a federal environmental assessment (EA) process. The purpose of my research is to understand what the process of considering climate change in EA could look like, some of its key components, and also the challenges that would be faced when attempting to implement climate change EA policies. Your participation in this interview will help to inform an understanding of the important considerations for creating a federal climate change EA strategy, as well as some of the challenges that may arise. This study will contribute to the data available for jurisdictions interested in reforming their EA process to include climate change considerations. The results of this study may also be beneficial to anyone interested in the topic of climate change and environmental assessment and may be valuable for any of their own future work.

Participation in this interview will require approximately 60 minutes of your time. The interview will discuss some of the potential options for how to assess the climate change contribution of projects, the ways a climate change assessment could be structured as an overall federal strategy, and some of potential barriers that prevent the implementation of an effective process for assessing climate change in EA. You do not have to answer questions you do not wish to and you can withdraw from the interview at any time. I will send you a copy of the transcript created from our interview to ensure accuracy and will also send summary so you can comment on some of the data interpretation.

With your consent, I would like to use an audio recording device during the interview and to take written notes. All recordings and notes will be kept in a locked cupboard, and once they have been transcribed into electronic files, the original recording will be deleted. Any electronic copies will be kept in a password locked file. Electronic files will not include any participant information in order to maintain anonymity. Unless you indicate that it is ok to quote you directly, all quotations will also be kept anonymous. Only my advisor and I will have access to the raw data, which I will destroy no later than July 1/2021.

You may withdraw completely from this study by contacting me via telephone or email before December 1/2019 as after that time my analysis and thesis writing will be nearing completion. If you withdraw, all the associated transcripts and recordings will be destroyed.

The results of this study will be published as a master's thesis through the University of Manitoba Natural Resource Institute. Once I have analyzed my data, if you request it, I will provide a summary of my findings once the results have been published as a finished master's thesis.

The Social Sciences and Humanities Research Council (SSHRC) has provided funding for this research under the University of Manitoba project #47314.

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and /or refrain from answering any questions you prefer to omit, without prejudice or consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

The University of Manitoba may look at your research records to see that the research is being done in a safe and proper way.

This research has been approved by the Joint-Faculty Ethics Review Board. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Coordinator at humanethics@umanitoba.ca or 204-474-7122. A copy of this consent form has been given to you to keep for your records and reference.

Participant's Signature _____ Date _____

Researcher's Signature _____ Date _____

I consent to be audio recorded for this interview: Yes ___ No ___

Would you like a summary of the research findings: Yes ___ No ___

Participant's preferred email address _____ *

* (I will use this email address to send a copy of the summary/briefing note and thesis if requested for review, or to send a copy of the interview transcript to ensure its accuracy.)