

Emissions Policy in Canada: Past Failures and Future Promises

by

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Supervisory Committee

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Abstract

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Climate change represents a challenging problem in public policy. This project examines various policy solutions to rising emissions, and suggests one that might be best suited to Canada, a highly-integrated, highly-developed economy which relies on natural resources, including fossil fuels, for its balance of payments, governmental revenues, and a small portion of its GDP. It adopts a public policy framework from Simpson, Rivers and Jaccard (2008) to analyze policy solutions using the following criteria: political acceptability, economic efficiency, administrative feasibility and effectiveness at reducing emissions. Additionally, it offers substantial discussion relating to the potential constraints and opportunities to climate change policy presented by NAFTA, compliance with which is key to the viability of any emissions regime. It advocates an upstream cap-and-trade system, integrated with the NAFTA area and regulated by an empowered Commission for Environmental Cooperation (CEC), as well as complementary policies to lower emissions in inelastic sectors.

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Dedication

To My Wife, for her limitless patience.

To My Family, for their unwavering support.

Introduction: Canada's Climate Challenge

The prevailing scientific consensus is that human activities are changing the climate. The scientific community has reaffirmed with a high degree of confidence that greenhouse gas (GHG) emissions must be reduced significantly within a very short time-frame to limit the negative consequences of climate change. Particularly salient to the Canadian situation are the projected intensification of ice cover melting in the Canadian Arctic, the growing acidification of sea water, rising forest fire hazards, and agricultural issues stemming from changing weather patterns. Temperature changes as a result of climatic forcing are disproportionately felt in the northern latitudes, with evidence suggesting that warming is occurring faster than previous models predicted (Soja et al, 276-7). According to the IPCC Fifth Assessment Summary for Policymakers, arctic ice, permafrost, and snow have declined significantly beyond the normal range, declines that are strongly correlated to the release of GHGs by humans (IPCC Fifth Assessment Summary 2013, 6, 15-17). Sea levels have risen dramatically, are expected to continue to rise, and are also strongly tied to anthropogenic activities (IPCC Fifth Assessment Summary 2013, 17, 21, 23). These changes have potential political and economic repercussions for Canada, with challenges to local environmental stability and Canadian sovereignty over the Northwest Passage, droughts in Canadian grain fields, increased climate refugee migration, increasing severity of pine beetle infestation in the forests of British Columbia and other detrimental species imbalances, as well as damage and adaptation costs to coastal cities (particularly in the Atlantic provinces and the BC lower mainland).

The intensified warming of northern latitudes has the potential further to alter the carbon balance globally, with the Boreal forest, one-third of which is in northern Canada and Alaska, acting as one of the world's largest carbon-sequestering ecosystems, the altering of which could make

combating climate change more difficult (Soja et al 2007, 276-7, 282). Research suggests that destabilizing outbreaks of forest insect pests have potential to increase dramatically with only a few degrees' heating. Additionally, warmer temperatures often "render trees more susceptible to additional stressors and their interactions, including insect pests" (Price et al 2013, 332-3). Soja et al. note likely increases "in areas burned, fire frequency, fire season length and/or fire severity" in areas in Russia, Canada and Alaska (Soja et al 2007, 279). Increasing wildfire frequency would lead to an increase in emissions from burning trees and vegetation. Further, approximately 40% of the Boreal forests lie atop a rapidly degrading layer of permafrost which, if trends continue, will release significant amounts of greenhouse gases (Price et al 2013, 332). All this will also significantly impact rural settler and aboriginal communities, which rely heavily on natural resources for their ways of life. Arctic communities' lifestyle and livelihoods rely especially heavily on their environment. The thawing of arctic ice and permafrost contribute significantly to positive feedback loops further accelerating climate change, as well as causing dramatic and irreversible damage to local biodiversity and wildlife.

Climate change is likely to have dramatic repercussions, in both economic and humanitarian terms. Economic study of climate change indicates the global economy will face increasingly harsh costs the longer we delay strong action to reduce emissions. Arguably the best-known and most influential recent study on the economic costs of climate change is the Stern Review on the Economics of Climate Change, commissioned by the Government of the United Kingdom (UK). The report stated strongly that the economic costs associated with mitigating climate change are far smaller when compared to the economic costs of allowing it to continue unabated along a "business-as-usual" scenario (Stern Report Executive Summary 2010, 14). Developing countries will fare worse in a warmer climate, as they have fewer resources for adaptation, and are geographically in areas more prone to drought, insect-borne disease, heat, and flooding. Thus, there are strong pragmatic and moral reasons for fast action to reduce emissions.

Canadian governments of different stripes have ostensibly recognized this as an important public policy issue, with declarations of action beginning in the 1980's with Prime Minister Brian Mulroney and his Progressive Conservative government, through the Liberal reign of Jean Chretien and Paul Martin, and currently, with the Conservative government of Stephen Harper. Unfortunately, aspirational public declarations and ineffective policies have characterized Canadian efforts to limit GHG emissions. Hamstrung at various times by concerns regarding competitiveness, constitutional tensions, scepticism regarding the role of humans in climate change, low priority in public opinion, and politicians unwilling to spend significant political capital on tough emissions policy, Canada has repeatedly set GHG reduction targets, and failed to achieve them.

We are at a critical juncture in environmental history, where meaningful and bold action at all levels of government is required to combat climate change.¹ Despite this, Canada continues to pursue an economic strategy emphasizing accelerated bitumen production, which is particularly carbon-, water-, and energy-intensive to produce. Further, Canada is increasingly disengaging from international efforts to bring carbon emissions under control, as indicated by its withdrawal from the Kyoto protocol, citing a need for a “made-in-Canada” approach, and preferring instead the non-binding targets of the Copenhagen Accord.

This thesis will add to the literature about a more appropriate policy approach for Canada, a highly developed, highly trade-exposed country that relies on raw mineral exports, including bitumen from Alberta's oil sands regions, to shore up its balance of payment, government revenue, and a small but significant portion of its GDP (Kellogg 2003, 8). I will examine intensity targets, export tariffs, carbon taxes, cap-and-trade, product standards, and other methods for lowering Canadian GHG emissions. I will borrow from Simpson, Rivers, and Jaccard (2008, 130) a policy analysis framework

¹ Experts state that, without strong additional measures to limit emissions, greenhouse gases in the atmosphere will reach 450 ppm/CO₂ equivalent (CO₂e), which is the generally agreed upon limit that must not be exceeded if global average temperature increases are to stay below 2 degrees Celsius (IPCC 2014, 11).

for determining the suitability of policy on the four-fold criteria of effectiveness, economic efficiency, administrative feasibility, and political acceptability. To these four criteria, I add “compliance with international trade agreements.” I believe this area is understudied in the realm of emissions policies, and is of increasing importance, given how economically integrated Canada is globally.

From this analysis, I recommend an upstream cap-and-trade system, integrated within the NAFTA region. I choose an upstream system over a downstream cap-and-trade or a carbon tax for various reasons. An upstream system is both easier to administer, focusing on the point-of-entry for carbon entering the economy, thus regulating fewer entities overall, as well as being more effective, as all emissions, including exported emissions of embodied carbon, are affected by price signals sent by the increased costs of carbon. This is contrasted by the sector-by-sector regulation of a downstream system, which often requires many additional policy measures to ensure effectiveness. An upstream cap-and-trade system is more politically viable than a carbon tax, as analysis of both federal and provincial attempts to institute a carbon tax shows the poor optics of “raising taxes” can destroy a politician’s electoral prospects.

Some sectors of the economy respond slowly to price signals. These inelastic sectors, particularly personal transport, require additional regulation to curb emissions. This project surveys a number of complementary policies for reducing automotive emissions, including programs to retire older inefficient vehicles and to encourage the purchase of more fuel-efficient, hybrid or electric vehicles, as well as low-carbon fuels standards, which mandate that automotive fuel have steadily decreasing carbon content.

The project will contribute to several on-going debates. This section will briefly outline three of the key literatures; it serves to situate this project in relation to their core debates:

- 1) Federalism and the constitutional tension surrounding provincial rights to natural resources

As political acceptability is important to the viability of any climate change policy, any plan to

reduce emissions would benefit greatly from both the federal and provincial governments being on board. Federal/Provincial tensions are an enduring part of Canada's political landscape. Constitutionally, provinces have jurisdiction over most natural resources, with some exceptions, such as most fisheries, trans-provincial and trans-national waterways, offshore oil, and uranium. This conflicts with the imperative of limiting emissions through a single rule-making body, as policies will require cooperation and coordination at all levels of government to be successful. Fossil fuel-exporting provinces, such as Alberta and Saskatchewan, claim that efforts to impose controls on carbon infringe upon their constitutional right to develop their natural resources. Some have challenged the constitutionality of federal climate-change policy (Lucas and Yearsley 2012, 226-7). This project will survey the literature relating to the level of government best suited to tackling climate change effectively. This review considers both constitutionality and efficacy. While it is unlikely that policy can be made that will satisfy all the provinces and also be effective at limiting emissions, policy can be designed to reduce friction and limit resistance.

The following analysis suggests that both levels of government have constitutional tools to limit greenhouse gases. Action must be taken at the federal level, as federally-harmonized emissions policy can limit "carbon leakage" amongst provinces. In doing so, Canada can reduce its emissions in the most cost-effective way, whereas a patchwork of provincial standards would place a disproportionate burden on provinces with high standards, and reward provinces with low ones. Further, for an integrated North American carbon market, the federal government is the most capable level of government to negotiate international treaties on behalf of Canada. This does not preclude a more proactive provincial policy stance. Provinces could implement more aggressive climate change policies; starting at the federal level simply sets a base-line.

2) Climate Policy: "Market Policies" vs "Volunteerism" vs "Command and Control"

Thus far, Canadian emissions policies have largely focused on public information campaigns,

voluntary regulations, intensity targets, and subsidies. The evidence gathered from a decade of these policies is that they have, at best, a marginal impact on GHG emissions (Simpson, Rivers and Jaccard 2008; Rivers and Jaccard 2010; Rivers 2010). These policies remained popular because they required little effort for politicians to pass them, for firms to comply with them without much productive effort in GHG reductions, and for citizens to change their lifestyles.

Recent Canadian policy has proposed intensity-based targets on some 700 of the largest final industrial emitters. Intensity-based targets limit how much GHGs can be emitted per unit of production, and impose a permit-trading regime to allow large emitters to buy emissions permits from low emitters. This differs from a traditional cap-and-trade system, which sets an overall limit on emissions and issues permits to firms or households representing their total allowable amount of emissions for a period of time. Firms can choose to use their permits to cover their emissions, sell surplus permits for profit, or buy additional permits to cover more emissions. The key feature of the traditional system is a hard cap on emissions, which is lowered periodically, thus reducing the overall emissions emitted. Industry groups prefer intensity-based systems to a traditional cap-and-trade system, because intensity-based targets do not set a ceiling on total emissions, and thus do not limit the expansion of production. The Canadian intensity-based program has been criticized for the low price that it puts on carbon (\$15 per tonne over the intensity limit).

3) Investment agreements, transnational market forces, and supra-national constraints on policy

Much has been written in the field of international law regarding the potential for bilateral investment treaties (BITs) to limit the prerogative of states to pass laws to protect the environment. However, the literature on emissions policy rarely mentions investment or trade agreements, beyond brief discussions in relation to competitiveness.² As BITs and trade agreements form supra-national

² For examples of work in the field of emissions policy that do not delve deeply into how investment agreements can affect efforts to combat climate change, or mention it only in a cursory fashion, see Lucas 2007; Fertel et al 2013; Craft and Howlett 2013; Hogg 2009; Antweiler and Gulati 2013; Lucas and Yearsley 2012; Niemeier et al 2008.

constraints on national policy, any national policy relating to emissions will have to abide by their rules, particularly rules that target specific industries with subsidies or restrictive standards. This project aims to integrate some of the literature in these two fields, enriching the emissions policy debate.

However, rather than focusing completely on the potential negative constraints on climate policy of BITs and other trade agreements, this project also will suggest that these agreements can be vehicles to limit both emissions and the competitive impact of emission reduction at home. A primary cornerstone of such a policy will be a future NAFTA-wide upstream cap-and-trade system in a coordinated effort to combat climate change. A North American emissions trading system is preferable to a strictly national program for several reasons. One of the key issues that prevent politicians from enacting strong emissions policy is the concern that it will unduly harm their jurisdictions' international competitiveness. By including its NAFTA partners, Canada eliminates much of this risk. This represents a logical next step in the functionalism that brought about NAFTA in the first place: North American markets, particularly energy markets, are already highly integrated. Integrating emissions regimes make sense, as long as the end result is an effective regime, and not a "lowest common denominator" standard. Further, integrated carbon markets would reduce the cost of compliance by widening the pool of permit buyers and sellers, allowing for greater economic efficiency, and providing greater incentive at the firm level to develop a competitive advantage in low-carbon production. While the viability of a North American carbon market depends on the circumstances of all three signatory countries, the United States, Canada and Mexico, this project exclusively examines the Canadian case, due to time and space constraints, and leaves the other two for further study.

Canada can reclaim its tarnished reputation for effective internationalism by championing this cause, and pushing for change, while resisting the temptation to fall back into the trap of grand rhetoric absent calculated and considered policy to back it up.

Chapter One: The Politics of Climate Change in Canada

This chapter analyzes the politics of climate change in Canada. Combating such a far-reaching and long-term issue presents a unique challenge to governance in Canada. This chapter begins with a broad enquiry into the environment generally, and climate change specifically, as an area of intergovernmental constitutional contention. This debate centres on the level of government legally allowed, and best suited, to tackle climate change. Establishing that the federal level has the prerogative to implement national limits on greenhouse gases is key, given that this project advocates exactly that. Next, this chapter outlines the domestic political history of climate change policy in Canada. It does this both to situate the forthcoming debate on emissions policy, and to derive clues from history as to which policy options might be politically more palatable to the Canadian electorate. Sub-national initiatives are examined separately.

From there, the discussion turns to Canadian involvement in international climate change negotiations. I examine how the Canadian position evolved through these talks from one of proactive climate leadership to one of self-interested recalcitrance. Several points of contention in the UNFCCC negotiations are important to examine closely, as they give us insight into the concerns Canadian policy-makers had about binding international GHG targets, and how future policy can ameliorate these concerns. Of particular note were the concerns regarding the loss of competitiveness that Canadian industries might suffer competing with unregulated firms in other countries. This discussion sets the stage for the beginning of the next chapter, which discusses in greater depth the international dimensions of climate change policy.

Climate Change and Federalism

Environmental issues occupy an unusual position in Canadian federalism, making the environment a challenging portfolio to manage effectively. The environment was not conceptualized

as a concern when the 1867 Constitution was drafted, and thus the “environment” was not assigned explicitly to either level of government. Instead, both levels have some influence over environmental issues, often in conflicting ways. The provinces have jurisdiction over the development of natural resources, an area that greatly impacts the environment, as well as over property and civil rights. The federal government has jurisdiction over trans-provincial pollution, navigation, fishing, as well as potentially broad jurisdiction over issues with a “national dimension.” Further, the federal government can influence environmental issues via their power to negotiate and sign international treaties on behalf of the provinces and via their jurisdiction over criminal law (Samson 2001, 209; Fertel et al 2013, 1148).³ Finally, the federal government can, through its superior financial resources, tempt and pressure provinces into compliance with federal policy through grant conditionality and similar powers.

The grey area that the environment occupies in Canadian federalism complicates potential action to curb GHG emissions. Climate change is also a trans-border issue, challenging the segmentation and division of powers that characterizes federalism, requiring a broad and holistic solution (Belanger 2011, 21).

Legal scholars have debated which level of government is best able to tackle climate change. Lucas and Yearsley (2012) examine recent attempts at regulating emissions in Canada, and question their constitutionality. They identify several heads of power that potentially could give the federal government the jurisdiction required to enact national climate change policy. These include federal jurisdiction over criminal law, national commerce, its broad purview related to “Peace, Order, and Good Government” particularly climate change being of “national concern” and the power to fill “gaps” in the constitution (the “residual” power).⁴ They note the informal “principle of subsidiarity,”

3 A notable example of the power over criminal law regulating the environment is the Supreme Court of Canada upholding Part 5 of the Canadian Environmental Protection Act (CEPA) which justified federal intervention in environmental matters that may encroach upon provincial jurisdiction (Belanger 2011, 22-23; Lucas 2007, 48).

4 Peace, Order and Good Government has three distinct branches with which to justify federal involvement: responding to

which states that, during jurisdictional disputes, the level of government most able to effectively deal with the problem ought to have jurisdiction.⁵

Some claim that this favours federal involvement in climate change policy. Climate change action needs to include the heavy-emitting provinces, and their absence, or the absence of strong policy on their behalf, jeopardizes the ability of Canada to meet its GHG reduction targets (quoted in Lucas and Yearsley 2012, 224-6). Others, including Lucas and Yearsley, disagree. Citing case law, they note that for an issue to be of national concern, it must have “a singleness, distinctiveness and indivisibility that clearly distinguishes it from matters of provincial concern,” that the “scale of impact be reconcilable with the fundamental distribution of legislative power” and have an evaluation of the “effect on extra-provincial interests of a provincial failure to deal effectively with the intra-provincial aspects of the matter”, and finally that the issue is new and did not exist at Confederation (Lucas and Yearsley 2012, 226).

While examining proposed amendments to the Canadian Environmental Protection Act (CEPA) that would create intensity standards and a cap-and-trade system for large final emitters, Lucas and Yearsley claim that these tests are not met. The reach into provincial jurisdiction would be too great, impacting industrial policy, resource policy, and internal economic decisions, among others.⁶ Further, as the proposed amendment treated GHG reduction and air pollution policies together, they note that the intrusion is not “singular” in nature. Finally, they claim that air pollution and even climate change is not new, and thus not a novel threat requiring an expansion of federal jurisdiction, although they

national emergencies, filling gaps in the Constitution, and areas of national concern. While this may seem to be a very broad power that allows federal involvement in a wide range of issues, it is subject to constraints, discussed below.

- 5 The principle of subsidiarity has emerged as an unwritten rule of constitutional interpretation through a recent supreme court decisions which frame it as a way of determining when provinces are able to resist federal interference in their areas of jurisdictional authority, and conversely, when the federal government is able to intervene with its broad powers. For a more thorough history of the evolution of this principle, see Newman (2011).
- 6 The limitation on the “national concern” branch of POGG which stipulates that federal encroachment “must be of a scale that is still reconcilable with the fundamental distribution of powers under the Constitution” and that “in *Re Anti-inflation act* held that in order for a matter to qualify as one of national concern falling within the federal POGG power, it must have ascertainable and reasonable limits, in so far as its impact on provincial jurisdiction is concerned.” (Chalifour 2008, 63).

concede that “the emergent critical nature of climate change and its consequences” might have transformed this issue into one of national concern (Lucas and Yearsley 2012, 226-7).

Lucas and Yearsley (2012) present excellent analysis of constitutional issues surrounding federal climate change initiatives. However, I argue that the emergent and critical threat of climate change, in fact, does make this an issue of “national concern” that justifies federal involvement. Climate change will have dramatic impacts on Canada and the rest of the world, physically, economically and politically. Scientific knowledge about anthropogenic climate change emerged only recently, long after the formulation of the constitution. A patchwork of various climate provincial laws makes it more challenging for Canada to reach its emissions targets. Provinces with weak regulations, likely the high emitters, can thereby shift the burden elsewhere in Canada, likely with a greater total economic cost to Canada. Without federal coordination, deep emissions reductions would be challenging. Many sub-regional climate initiatives have fallen apart, such as the trans-national Western Climate Initiative (WCI). The WCI has only five remaining members, and little coordinated action on the horizon (Harrison 2013, s106).

Peter Hogg draws a parallel between GHG emissions and marine pollution, the latter having been the subject of federal intervention and a Supreme Court case. In *R. v. Crown Zellerbach Canada Ltd.*, Hogg notes that “marine pollution was a matter of national concern distinct from matters of provincial jurisdiction and that was beyond the capacity of the provinces to control” (Hogg 2009, 516). On these grounds, a strong case could arguably be made for a national policy to combat climate change.⁷

Lucas and Yearly note that while emissions limits might be constitutionally within federal prerogative, via the power of criminal law, an emissions-trading system would encroach too much

⁷ However, it should be noted that the vote in the Supreme Court on this case was close, at 5-4 in favour of allowing federal intervention. In their dissents, the minority found “that marine waters were so intermingled with fresh water and affected by coastal activity and deposits from the air, that the regulation was not sufficiently distinct from provincial jurisdiction (Chalifour 2008, 63).

upon provincial jurisdiction to regulate resource development and industrial operations (Lucas and Yearsley 2012, 221). Hogg disagrees, citing a Supreme Court decision surrounding federal initiatives to ban tobacco advertising. In *RJR-MacDonald v. Canada (A.G)*, the Supreme Court held that alternative means of compliance were valid as long as they were aimed at the same public goals that traditional criminal enforcement would bring about. Given the impracticality of banning cigarettes outright, due to the large numbers of Canadians who smoked, the Supreme Court found that the advertising ban pursued the same goals: that is, protecting the public from a dangerous product (Hogg 2009, 514-515). Thus, a federal emissions-trading scheme might be upheld as constitutionally valid as long as it, as a means of compliance, pursues the same public goals as criminal penalties.

But claiming that it would be within federal jurisdiction to enact a national emissions policy is not unanimously agreed upon in the literature. Observing the constitutional tension between the two levels of government, Belanger (2011) argues that climate change policy is best enacted at the provincial level. While she rightly notes that the some provinces have been innovators of climate change policy, citing progressive legislation in BC, Quebec and Ontario, she neglects to mention that some are not (Belanger 2011, 25). Relying on provincial initiative to curb emissions neglects the fact that those provinces that emit the most are the least likely to implement effective policies. When the Kyoto Protocol was signed in 1997, Ontario was the top emitter in Canada, due to its strong manufacturing sector. However, since then, Alberta has far surpassed Ontario, rising 46% since 1990, due to a precipitous increase in the production and exportation of bitumen and bitumen-derived light synthetic crude from its oil sands regions. It is no coincidence that the most vocal opposition to federal measures limiting or taxing emissions comes from Alberta (Environment Canada 2014) While Alberta has enacted an intensity-based GHG regime, the exceptionally low price cap of a \$15 per tonne contribution to a “technology fund,” limits the potential for strong reductions, particularly in the short term before carbon-reducing investments facilitated by the fund are deployed.

Further, Harrison (2013) examines various sub-national initiatives to reduce GHG emissions, in both US states and Canadian provinces. She notes a tendency among sub-national units to attempt to maximize credit for GHG abatement, and to export negative repercussions. Harrison states that federal cooperation and support for sub-national climate change initiatives is crucial to their continued viability, and that both the American and Canadian federal governments have largely failed to provide this support (Harrison 2013, s106).

Belanger notes that provinces often serve as excellent policy laboratories, innovating with a flexibility that the federal government would have trouble duplicating. She uses public health care and government-subsidized daycare as examples. But she fails to take the example to its logical conclusion: after being proven successful provincially, federal involvement brought the benefit of public health care (though not public day care) to the rest of Canada (Belanger 2011, 26). If that was a necessary next step for this policy, why would emissions policy be different? Moreover, the two are not mutually exclusive: provinces are free to innovate with their own policies in conjunction with federal initiatives, as long as they meet the minimum federal standards.

Greater coherence between provincial and federal policies would reduce redundancies and lower costs (Fertel et al 2013, 1139-40). A national energy policy in conjunction with a national climate change regime would greatly reduce the uncertainty that comes from a patchwork of climate policies. Howlett and Geist also note that greater coherence and coordination between federal, provincial, and municipal governments are integral to an efficient approach to climate change. They cite lessons learned about the interaction of national, regional and city-level climate policies in the EU (Howlett and Geist 2012). Harmonizing policies and facilitating the transference of knowledge vertically and horizontally between and within governments is important to successful emissions policy. For instance, efforts by the provincial and federal governments to support municipal efforts to reduce GHG emissions, through funding and expertise, will pay dividends.

At any rate, negotiating with the provinces to bring them on board is essential, regardless of whether the federal government has the strict constitutional right to impose emissions policies unilaterally to combat climate change: provincial buy-in is key to the continued viability of any such regime. Shattering provincial trust by suddenly and arbitrarily doubling Canadian commitments during the Kyoto negotiations, PM Jean Chretien ensured an antagonistic relationship between Ottawa and the provinces in climate policy, particularly in western Canada. Provinces have many political, legal, and administrative ways to fight imposed legislation. Fertel et al. note

the Canadian Constitution forces the federal government to ensure opportunity and to reduce the disparity of opportunity among the provinces. Thus any federal policy that reduces GHG emissions making the use of fossil fuels more expensive could legally be challenged by a province dependant on fossil fuels. Such a policy would affect the competitiveness of the province, (increasing its production costs) and would create a disparity of opportunity (Fertel et al 2013, 1148).

While emissions policy could well be designed to survive a Supreme Court challenge, it would be a political necessity to limit the differential impact between provinces in some fashion. This could be by recycling funds raised by taxes or through permit-auctioning, proportionally back to the provinces from which they came, or by similar measures. At any rate, working collaboratively with the provinces and territories would be cheaper and more effective. The wisdom of this is present in CEPA. Equivalency agreement clauses are included, stipulating that if provincial regulations meet or exceed the level of stringency of federal programs and include a method of citizen petition to investigate possible non-compliance, the federal cabinet can issue an order to withdraw CEPA regulation in the same areas from operation in that province (Lucas 2007, 48).

The history of Canadian emissions policy

As important as constitutional issues, the history of climate change politics in Canada offers important lessons in increasing the viability of future GHG reduction regimes. Climate change has been present in Canadian discourse since the 1980s, yet little effective policy has been implemented.

To understand why not, we turn to the politics of environmental policy generally, and subsequently emissions policy.

The environment gained prominence in Canadian discourse in response to the increasingly visible impacts of economic development, such as forest clearing and hydro-electric dam building, on the land, which forms an important part of the Canadian identity (Belanger 2011, 23; Samson 2001, 200). A series of high-profile environmental catastrophes, such as the discovery of the so-called ozone hole, the nuclear fallout from Chernobyl, and a fire in a PCB storage facility in Saint-Basile-le-Grand in 1988 further pushed environmental concern into the public consciousness (Belanger 2011, 24). Further, in 1989, emissions had already become a concern for Canadians, as acid rain was the top environmental issue and the subject of a highly successful agreement between the United States and Canada (Samson 2001, 210).

As mentioned already above, Canadian governments have broadly preferred climate change policies that caused minimal economic or political friction, such as public education programs, or subsidies for renewable energy and consumer energy efficiency, over more effective but politically difficult policy measures, such as taxes and regulation. Initially, when scientific analysis began to show that the climate was changing, the Progressive Conservative government of Brian Mulroney was viewed as an international leader. Canada sponsored the first global conference on the subject (Smith 2008/9, 48). Unfortunately, rhetoric since then has not been matched with strong policy action. Successive Liberal and Conservative governments failed to show leadership on this increasingly important issue. Environment Canada became increasingly marginalized internally as governments focused instead on development of Canadian energy resources (Smith 2008/9, 49).

Government action on climate change in the late 1990's and early 2000's stressed policies that promoted voluntary emissions reductions rather than binding regulation. Industries were encouraged to sign "voluntary covenants" with the federal government, agreeing to non-binding commitments to

reduce their emissions. Citizens were encouraged to reduce their carbon footprint through public education and awareness campaigns, such as the “one-tonne challenge,” which promoted energy conservation and efficiency at the individual level (Lucas 2007, 46). These measures were a large part of the first federal climate change program in 2000.

By 2005, federal climate policy had shifted away from these measures and towards regulation. Lucas cites simply the gradual recognition that the previous policies were ineffective. Many elements of current federal emissions policy proposal were present in the 2005 climate change plan, including a system that focused on regulating Large Final Emitters (LFEs), and a technology fund that firms could pay into to meet some of their commitments. Lucas states that the reason for the shift away from voluntarism towards regulation was a re-assessment showing that Canada's “Kyoto gap” (the gap between Canadian Kyoto targets and current emission levels) was larger than previously estimated (Lucas 2007, 56). If Kyoto targets were to be met, more stringent policies would be needed.

Political action relating to climate change intensified dramatically during 2008. The federal election that year saw an unprecedented move by the federal Liberal Party to dedicate a significant portion of their election platform to combating climate change. Their “Green Shift” plan included a series of policy measures including a nationwide carbon tax. This wagered their electoral fortune on public concern over climate change. At the time, the wager did not seem to be unfounded. British Columbia, led by the centre-right provincial Liberal Party, had just enacted its own province-wide carbon tax, with an initial price of \$10/tonne and with scheduled yearly increases of \$5 a tonne through 2012, where it would reach \$30/tonne.

Harrison (2012) examines why BC Liberals were able to enact and maintain a carbon tax, while federal Liberals under Stephane Dion not only lost the election, but received the lowest share of the popular vote in the party's history and lost fully one quarter of their seats in Parliament (Harrison 2012, 397). Harrison notes in both cases that the tax was pushed forward by a party leader who strongly

believed in the necessity of pricing carbon, and that a tax was the best way to do so. In both cases, political advisers to Premier Campbell and Stephan Dion cautioned against the tax. Opposition parties lobbed vitriolic attacks, claiming that the tax disproportionately affected northern communities and let “big polluters off easy,” as the provincial NDP claimed, or that it was a “tax on everything” and would “screw everybody across the country,” as federal Conservatives alleged (Harrison 2012, 391, 386). Despite a recent groundswell of public concern regarding climate change and the environment generally, the economy had re-emerged as the primary concern among electors in 2008, with financial crises unfolding worldwide. The barbs thrown by the federal and provincial NDP and by the federal Conservatives hit their mark and did damage. Why then did the tax pass and remain in British Columbia, while failing federally?

Harrison notes that in the case of BC, a strong incumbent leader with a powerful mandate spearheaded the carbon tax. Federally, the carbon tax came from an untested leader heading into an election as the underdog, leading a party at an all-time low. Further, while the provincial Liberals barely campaigned on their carbon tax, focusing instead on the economy, the “Green Shift” was the centre of the federal Liberal campaign strategy. In both cases, opposing parties attacked the tax as economically dangerous, but the BC Liberals faced no opposition on the right and had better economic reputation than the NDP, while the federal Liberals were attacked on the right by the more business-friendly Conservative party (Harrison 2012, 404).

Several lessons can be learned from this analysis. First, although the environment has recently surged periodically as an issue in the eyes of the public, the economy has always been high on the public agenda. Politically, emissions policy must be crafted with economic concerns in mind, and framed so as to emphasize that the public’s economic prospects are not threatened. Second, the word “tax” is almost always politically unpopular, even if it is revenue-neutral, or proven to have a net benefit to the economy. Harrison notes a general preference for cap-and-trade systems over a carbon

tax among the electorate, despite a widespread lack of understanding of how a cap-and-trade system actually works, beyond vague notions that it “makes big polluters pay” (Harrison 2012, 403). Harrison notes that this somewhat irrational aversion to the word “tax” might make a carbon tax good policy, but bad politics. Harrison notes that “cap-and-trade again has significant political advantages, because the complexity of the system and the indirectness of costs to consumers render costs to individuals relatively invisible” (Harrison 2012, 387). Third, the BC tax passed due largely to the efforts of former Premier Gordon Campbell: a strong leader already in government was integral to the enactment of the carbon tax. Given the federal Conservatives’ negative statements on taxing emissions, similar leadership will be unlikely to come from the current Prime Minister’s office. Some form of cap-and-trade system, given shared support from both the federal NDP and Conservatives (with important differences), seems the more likely choice, should the current government ever be compelled to choose between the two.

Shortly after these two 2008 initiatives, Canada signed the 2009 Copenhagen Accord along with the United States. This accord now forms the basis of Canadian emissions targets. Under the accord, Canada is committed to reducing its emissions to 17% below 2005 levels by 2020 (Environment Canada 2013, 1). This target is far less stringent than its former Kyoto goals, given that emissions are measured against 2005 levels, and not against 1990 levels, which is the standard scientific baseline for measurement. The latest modelling data from Environment Canada suggests that, absent additional policy measures, Canada will likely fail to achieve its Copenhagen targets. The Environment Canada report notes that, while emissions intensity per GDP has improved, actual gross emissions will only be 3 Mt lower than 2005 levels.⁸ Emissions levels are expected to rise continually in the period of 2005-20 in all sectors except electricity generation, with the rest of the reductions coming from expected

8 Further, a recent op-ed piece in *Nature* criticized the targets outlined by signatories of the Copenhagen Accord. The authors claimed that, even if countries were on track to meet their targets, the amount of carbon dioxide equivalent (CO₂e) in the air would still likely drive global average temperatures above the 2 degrees C threshold which scientists believe is when the more dire impacts of climate change would manifest. (Rogelj and Meinshausen 2010)

land-use changes, of which a substantial amount is in the category of 'forest land remaining forest land'. While the conservation of forest land is important, its inclusion obscures the actual limited reductions that industry is making. Of further note, the sector expected to experience the largest emissions growth is oil and gas due to the continued rapid exploitation of oil sands, which is projected to almost triple its output between 2005 and 2020 (Environment Canada 2013, 19-24). In the electricity sector, other regulations aimed at lowering emissions include a performance standard aimed at coal-fired electricity generation and an outright ban on traditional coal-fired electricity generation. These come into force in 2015 (Environment Canada 2013, 29).

Provincial and Territorial Initiatives

Emissions vary significantly by province due to a number of factors, including population size, economic activity, resources base, and energy profile. According to Environment Canada modelling, total emissions are projected to decline or stay the same between 2005 and 2020 in most provinces and territories, with significant reductions in Ontario. However, emissions from Alberta are projected to increase steadily to an additional 63 Mt CO₂e by 2020 (Environment Canada 2013, 35-6). This speaks to the need for federal regulation in addition to provincial legislation, or in lieu of it, as rising emissions in Alberta wipe out all the gains made in the rest of the country. Further, these models are based upon a growth rate of 2.9% annually and a world oil price of \$102/bbl in 2020. Higher growth rates and/or oil market prices would likely increase emissions further, barring any sudden and dramatic technological innovation, which would increase the market viability of deeper, harder to reach deposits which require more time and energy to harvest. Conversely, slower growth and lower world oil prices would have the effect of lowering emissions (Environment Canada 2013, 39).

Domestically, a strong push against federal GHG regulation came from Alberta and Ontario, who railed both against federal encroachment on provincial jurisdiction relating to natural resources and against “foreign” encroachment on Canadian sovereignty, sabotaging Canadian interests (Smith

2008/9, 53). Interestingly, many provinces have since adopted measures to reduce emissions that, in some cases, are stronger and more heavy-handed than federal proposals. This proactive legislation may have been meant to head off possible federal regulation to protect their own jurisdiction.

Provincial initiatives are worth looking at in more detail. In 2008, the provinces and territories committed to increasing their energy efficiency by 20% by 2020 in areas of provincial jurisdiction. That would set the goal of the provinces, reducing emissions by 625 mt by 2020. This is slightly ahead of federal targets, which aim for a reduction of 607 mt by 2020 (Fertel et al 2013, 1144-6). Environment Canada notes that emissions from coal-fired electricity generation will decline significantly largely due to provincial initiatives, which could be reflective of the greater authority over industrial policy that provincial governments hold. As mentioned above, BC and Quebec both instituted carbon taxes, with BC's being more robust. Ontario is phasing out coal-fired electricity generation (Environment Canada 2013, 29).

Similarly, Nova Scotia aims to reduce its emissions from electricity generation by a cap on total emissions and a renewable portfolio standard, which requires 40% of electricity sold to be from renewable sources by 2020 (Environment Canada 2013, 29).⁹

In addition to the carbon tax, BC has instituted several other policies to reduce emissions. These include a clean energy standard system, which stipulates that a certain amount of electricity in the province must be from zero-emissions sources; a ban on natural gas venting (to be fully in force 2016); a commitment to have a carbon-neutral public sector; and until recently, the Pacific Carbon Trust, through which public sector organizations must purchase offsets to bring them to carbon-neutrality, and which, in turn, invests that money in private sector carbon reduction.

Canada Abroad: International Climate Change Negotiations

In examining international climate change policy, Smith (2009) notes that Canadian negotiating

⁹ A renewable portfolio standard refers to a policy that mandates a certain percentage of electricity generation come from renewable sources (wind, solar, geothermal, etc).

efforts focused largely on putting economic interests before GHG reductions. The Canadian position evolved as UNFCCC negotiations progressed, and the focus went from broad commitments to limit emissions, spearheaded by scientific experts, to pragmatic negotiation of targets and specific obligations under a potential treaty. At that point, negotiations were taken over by officials more concerned about the political and economic ramifications of agreeing to limit emissions.

Early on, Canada had positioned itself as a sort of broker between the EU, which generally favoured more stringent regulations based on hard timetables, and states such as Japan, US, Australia, New Zealand, Norway, Switzerland, and Iceland, collectively known as JUSSCANZ, which pushed for lower emission targets and greater flexibility in meeting those targets (Samson 2001, 204-7; Smith 2008/9, 50). Additionally, Canada attempted to broker relations between developed and developing countries.

In doing so, Canada's position focused heavily on mitigating any potential competitive disadvantage that it might face from an agreement to limit GHGs. Particularly, Canadian negotiators were adamant that natural carbon sinks should be included in the calculations, and that large developing countries commit to, at a future date, some sort of emissions limit, and engage with the Kyoto Clean Development Mechanism (CDM) program to encourage low-carbon development (Samson 2001, 207). By including managed forests and agricultural land as eligible carbon sinks, the actual emissions reductions for Canada to reach its targets would have been much lower. The impetus for pushing developing countries towards firm commitments stemmed from a desire to protect Canadian exports from being unduly disadvantaged against rapidly developing economies like China and India. These positions were supported by domestic industry groups, and the "Umbrella Group," which superseded JUSSCANZ as "the focus of non-EU industrialized country discussion... as well as a source of recognized clout in the negotiations" (Samson 2001, 207 footnote). As Samson notes in his analysis of the UNFCCC negotiations,

In some ways, when Canada was forced to withdraw the city of Toronto as a candidate to host the permanent FCCC secretariat at CoP1 in 1995, it was a symbolic moment. Canada's role as a leader in the international climate change negotiations, which had begun in the mid-1980s, had given way to the competing pressures of its national circumstances (Samson 2001, 211).

Unfortunately for Canadian negotiators, their efforts found resistance on all fronts. The EU was staunchly against including natural carbon sinks, seeing them as weakening the overall agreement, and from developing countries, which refused to commit themselves to any targets or constraints (Samson 2001, 207).

Domestic pressures complicated the Canadian negotiation position. The rising prominence of environmental issues in public discourse, coupled with Canada's earlier leadership in climate change negotiations, created an expectation of progress. This clashed with growing public concern over the economy. The Canadian position was opposed on multiple domestic fronts. Environmentalists saw the Canadian position as not stringent enough. However, industry lauded the flexible measures and emphasis on credit for early action and tradable permits (Samson 2001, 203-4).

During the negotiations, Prime Minister Jean Chretien shattered a fragile domestic consensus on the level of reductions Canada ought to commit to, telling Canadian negotiators to agree to a 6% reduction from 1990 levels, fully double what the provinces had agreed to. This sudden change both put Canadian goals unrealistically high, and ruptured provincial trust in the federal government (Simpson, Rivers and Jaccard, 2008, 37). Reports indicate that this sudden change was due to the governing Liberals wanting to appear proactive in terms of climate change for the forthcoming federal election. Intending to tap into the ever-present sense of moral superiority the Canadian public felt towards the United States, Canadian negotiators were instructed to essentially "one-up" the American proposal (Samson 2001, 205).

Despite ratifying Kyoto in 2002, Canada continued to negotiate for loopholes and flexible standards (Smith 2008/9, 51). During this time, most participants in international negotiations on

climate change had divided into one of three camps: the JUSSCANZ group, sometimes including Russia, who argued for weaker targets and flexible compliance mechanisms; the EU group, spearheaded by France and Germany (whose enthusiasm was somewhat tempered by the UK); and the G-77, often championed by China, India, and Brazil, who staunchly argued against setting targets for developing countries (Brenton 2013, 543-4).

After the attack on the World Trade Centre and Pentagon in 2001, the United States found its political leadership almost entirely focused on terrorism for several years, with limited interest in climate change negotiations. Little was done during the presidency of George W. Bush. However, internationally, some progress was made, including broader consultation at sub-UN fora. The G-77 also became willing, at least to contemplate targets in some fashion. Partly, this was due to the historic moment in 2005 when China surpassed the United States as the top emitting country. Partly, it was due to the increasingly dire estimates in successive IPCC reports and the increasing salience climate change had, as an issue area, for citizens globally.

As mentioned earlier, in 2009, Canada signed the Copenhagen Accord. This was a non-binding agreement that eventually expanded to include countries representing 80% of total global emissions. In signing, Canada aligned its targets with those of the United States, both agreeing to reduce absolute emissions by 17% of 2005 levels by 2020. During the Copenhagen negotiations, Canada continued to argue for weaker standards. A recent editorial in *Nature* noted that in “aligning itself with the US target, Canada is the only country that both weakened its ambitions in the course of the negotiations, and effectively argued for an increase of 2020 emissions allowances above its current [at the time] Kyoto Protocol target: 3% above instead of 6% below 1990 levels (Rogelj and Meinshausen 2010, 1). Many also criticized the Accord’s non-binding nature, stating that it provides few negative consequences for missing targets. In 2011, Canada also withdrew from the Kyoto Protocol, making it the first country to withdraw from a binding international agreement on climate change. The Kyoto

Process continued, albeit without many key players, such as the United States and China.

To review, Canadian foreign policy on climate change negotiations was initially proactive and broadly reflective of Canada's tradition of cooperative internationalism. However, as bold announcements and grand gestures gave way to hard-nosed negotiations over competitive advantage and economic impact, Canadian policy became very similar to that of the United States. It pursued “made-at-home” targets, committing only to voluntary international targets.

While it is unfortunate that Canada chose to disengage with the Kyoto Protocol, and instead opted for the weaker targets of the Copenhagen Accord, aligning Canadian emissions targets with those of the United States makes sense, given their highly integrated energy markets and similar per-capita energy usage patterns. While Canadian Kyoto targets were still far from the scientifically recommended levels to avert catastrophic climate change, 3% below was better than nothing, and unilaterally doubling them despite the tenuousness of provincial buy-in meant that they were unlikely to be adhered to. Hopefully, harmonized targets will limit the temptation for Canadian policy-makers to sacrifice politically feasible policy for electoral opportunism.¹⁰ Further, harmonization will reduce potential friction in negotiating a future North American carbon market, a development that this project advocates in later chapters. The potential to re-engage in multilateral climate change negotiations is not gone forever. Any North American emissions trading system could be connected with those in other jurisdictions. However, as we have seen in the Kyoto negotiations, near universal agreements are challenging to negotiate, and a continental approach might be easier to organize.

¹⁰ However, the onus may soon be upon Canada to strengthen its commitments in reducing emissions, as the Obama administration recently announced additional strong policies to combat climate change, through the power granted under the Clean Air Act, thus deftly sidestepping potential Congressional and Senatorial roadblocks. (Liptak, Adam. “Justices Uphold Emission Limits On Big Industry.” *The New York Times*. N.p., 23 June 2014. Web. 20 July 2014. <<http://www.nytimes.com/2014/06/24/us/justices-with-limits-let-epa-curb-power-plant-gases.html>>.

Chapter Two: NAFTA and Climate Change

This chapter will discuss three broad themes related to emissions policy. Firstly, it will discuss the potential for an integrated carbon market with the United States and Mexico through NAFTA. This could be regulated by an international institution, either entirely new or a restructured North American Commission for Environmental Cooperation (CEC), the secretariat mandated to monitor the environmental side agreement of NAFTA.

Secondly, it will examine policy options for Canada to reduce emissions and assess their compliance with NAFTA provisions. This is an important element for environmental policy generally, and emissions policy specifically, as certain climate change policies could conflict with the trade law concepts of fair and equitable treatment, national treatment, and expropriation. National governments might also be tempted to target foreign-owned firms to bear a disproportionate share of the burden of reduced emissions. In doing so, they risk involvement in arbitration, an ordeal that could cost governments a great deal of money, administrative problems, and political legitimacy both at home and abroad.

Thirdly, this chapter will discuss how investment agreements can be used to facilitate the transition to a low-carbon economy. This is contrary to conventional analysis on investment agreements, which often are viewed as constraints on government initiatives to protect the environment.

NAFTA and integrated carbon markets

Integrating carbon markets and policies with the NAFTA zone generally, and the United States in particular, is of key importance, as is independent monitoring of emissions. Indeed, the Canada-US energy market is already highly integrated. It is also key to the economic and foreign policy strategies of Canada and the United States, with the former attempting to become an “energy superpower,” and

the latter increasingly pursuing energy independence from sources outside of North America. In fact, Canada is the only place from which the United States is increasing its energy imports (Schott 2013, s110). While the two countries have similar goals in terms of energy development, their emissions policies are uncoordinated, both federally between Canada and the United States, and sub-nationally in Canada. The fact that Canada is the only G8 country to have no national energy plan is partially to blame.

NAFTA already includes side agreements dealing with labour and the environment. Like the labour side agreement, the environmental side agreement, the North American Agreement on Environmental Cooperation (NAAEC), also created the Commission for Environmental Cooperation (CEC), to monitor the environmental impacts of trade liberalization in the NAFTA region. The CEC is comprised of three key bodies. Firstly, the Council of Ministers, comprised of cabinet-level ministers from each respective country. Secondly, the Secretariat, which provides technical, operational and administrative support to the Council, issues annual reports of the councils activities, authors expert reports on issues surrounding environmental cooperation between parties, and can review complaints from NGO's or citizens on alleged failures to enforce domestic environmental policy. However, aside from the annual report and administrative functions, the Secretariat requires a two-thirds vote to proceed with its other functions. Thirdly, the Joint Public Advisory Committee (JPAC) is comprised of 15 members, equally appointed by each of the parties, entirely comprised of civil society parties. It advises the Council on various issues relating to the agreement. Finally, in addition to these three bodies, the NAAEC has a dispute settlement mechanism, through which a party can accuse another party of failing to uphold domestic environmental regulations. If a solution on the issue in question cannot be mutually agreed upon, an arbitral panel of experts is convened to decide on the matter (Phillips n.d., 10-15). This makes NAFTA unique: no other trade or investment agreement has a standing secretariat or consultative body for complaints from NGO's and citizenry on environmental

issues.

However, some commentators have noted limits to the effectiveness of the CEC in fulfilling its mandate, such as a lack of communication and cooperation between the CEC and the NAFTA Free Trade Commission (FTC). The side agreement on the environment does not obligate the FTC to work with the CEC, and thus environmental and trade issues are often handled separately (Carpentier 2006). The environmental dispute settlement procedure is only able to rule on environmental issues as they relate to the production of goods and services for trade. Further, large-scale resource extraction is excluded from the purview of the NAAEC, limiting its usefulness in enforcing environmental laws in sectors of the economy which have a large-scale negative impact on the environment (Phillips n.d., 15). Some progress has been made through NAFTA and the CEC encouraging greater collaboration in relation to the climate. At the 2009 North American Leaders Summit, the heads of the NAFTA states “refocused their attention on the importance of climate change issues and instructed officials to develop a trilateral working plan for consideration at their next summit” and “at the CEC ministerial meeting in August 2010, North American Environmental Ministers also committed to improving the comparability of data gathering and inventories for mitigation and adaptation projects” (Fickling and Schott 2010, 10).

Empowering the CEC with a stronger mandate to monitor emissions policy and carbon trading between NAFTA countries would allow for greater harmonization, efficiency, and effectiveness. Various measures to limit GHG emissions and their compliance with international trade law, as differentiated taxation, subsidy schemes, and product standard changes could potentially run against national treatment and expropriation clauses in NAFTA and other free-trade/bilateral investment agreements (NAFTA, Article 301 and 1100). This is dealt with later in the chapter.

Beyond concerns about exposing Canada to trade disputes and arbitration, some policy schemes are easier to harmonize with those of our trading partners than others. For example, Rivers and Jaccard

note that an intensity-based system can be more challenging to integrate with the emissions pricing policies of other countries, should most of these opt for some type of absolute cap-and-trade system, as appears to be occurring. Rivers and Jaccard note that, “while permits could (in theory) be tradable between countries with cap-and-trade systems and emissions performance standards, the differing incentives offered by a performance standard may mean that countries with a cap-and-trade system may be reluctant to allow such permit trading” (Rivers and Jaccard 2010, 425). Differing intensity standards can be difficult to harmonize, particularly if standards differ nationally between various sectors of the economy. This statement is mirrored by Schott who notes, “cap-and-trade systems can be linked without explicit coordination, as long as they have absolute caps and are not based on historic baselines and energy intensities (Schott 2013, s117).”

Similarly, downstream cap-and-trade systems run into issues when it comes to international harmonization. Due to the difficulty of calculating emissions produced by small sources (households, transport, small business), downstream cap-and-trade systems often focus on large emitters and implement complementary policies to cover other areas of the economy, either a carbon tax or other policies (NRTEE 2007, 24). This makes a downstream system more complex to administer, and to explain to voters. This administrative complexity holds true when attempting to harmonize standards internationally, as both tax schedules and permit systems would need to be harmonized, as opposed to just permits and overall ceiling within an upstream cap-and-trade system.

Arbitration and emissions policy

Some have registered potential concerns regarding the establishment of a domestic emissions trading regime and how such a regime might conflict with certain provisions in international trade and investment agreements. Canada is a long-time member of several such agreements, including the WTO and NAFTA. Allocation of credits that favours domestic firms over foreign competitors would likely infringe upon national treatment clauses. Lucas notes that neither the UNFCCC nor the Kyoto Protocol

are “among the multilateral environmental agreements specifically given priority in the event of inconsistency by NAFTA's Article 104” (Lucas 2007, 58). The Copenhagen Accord, being non-binding in nature, also would have no precedence over NAFTA.

Commentators have noted a fundamental philosophical conflict between trade and investment agreements on one hand, and international environmental agreements on the other. The former are concerned with facilitating economic activity at maximum efficiency; the latter, with limiting the environmental impacts of economic activity (Hornsby et al 2007, 288). In examining potential conflicts between NAFTA and the Kyoto Protocol, Hornsby et al. note a fundamental conflict between the two agreements on what standard of proof is sufficient to motivate action. The Kyoto Protocol, like narratives surrounding climate change generally, follows the precautionary principle, which essentially states that when dealing with such long-term forecasting as climate change predictions, that action must occur, despite a certain measure of uncertainty, to prevent disaster. If policy-makers wait until the scientific community is completely certain about the exact nature and impact of climate change, it will be too late to do anything about it. Conversely, NAFTA stipulates that measures to protect the environment must be provisional, based on current empirical evidence and subject to a scientific review process, and must be the least trade restrictive possible (Hornsby et al 2007). Thus, NAFTA allows a much weaker and short-term response to environmental issues, and never allows a more proactive and trade-restrictive response. Assuming that signatories intended to take their Copenhagen targets seriously, NAFTA could potentially limit their ability to achieve emissions targets.

Broadly speaking, most bilateral trade and investment agreements have provisions to prevent member states from favouring domestic industry over foreign competitors. This generally takes the form of “national treatment” or “most favoured nation” clauses. These prevent signatory nations from raising barriers to imported goods from other member nations, from enacting policy that favours domestically owned industry over subsidiaries owned by nationals of signatory countries, or

expropriating property or profits from such foreign-owned firms. Most modern investment agreements have investor-state dispute settlement mechanisms, often in the form of ad-hoc arbitral tribunals. Investors prefer this system over bringing disputes before national courts for a number of reasons. Firstly, national court proceedings are time-consuming and costly, subject to appeals and a wide variety of public interest concerns that might influence results outside the terms of the original investment. Secondly, foreign companies might not otherwise have standing in national court systems, and would have to petition the government of their home country to pursue compensation bilaterally, or through the WTO. This again can be costly and time-consuming, and also subject to political considerations of their national government in dealing with other states. Finally, in the case that disputes cannot be solved amicably, bilateral investment treaties empower tribunals to award damages, ostensibly guaranteeing firms compensation for unfair government action (Cummings and Froehlich 2007, 110-116).

When harmonizing national emissions policy with international trade regimes, both to ensure compliance and to limit competitiveness loss, it is prudent to examine some arbitral decisions that have been important in the international investment literature and their impact on national prerogatives to implement emissions policy. Due to time and space constraints, I focus on NAFTA, as it is arguably the most important trade agreement that Canada is part of, has a rich history of available jurisprudence, and serves as the basis for the Canadian Model BIT.

Ethyl Corporation v. Government of Canada is viewed as an important case in terms of the impact international investment agreements can have on domestic environmental regulation. In 1994, Canada announced its intention to ban MMT, a chemical additive in unleaded gasoline that was produced and imported into Canada by Ethyl Corp. Disputing this move, stating that MMT was not harmful to public health, Ethyl Corp. filed a Chapter 11 dispute, which is the section of NAFTA that deals with unlawful taking and expropriation. Ethyl Corp. claimed that the Canadian Government's

“actions were tantamount to an expropriation of its goodwill. Ethyl sought damages of \$251 million” (Cummings and Froehlich 2007, 117). Rather than face costly arbitration, Canada settled with Ethyl Corp., paid \$19.3 million, and repealed the law. This case sets an important precedent, in that the threat of arbitration made Canada reverse a decision ostensibly made to protect public health and the environment. It is relevant to this project because setting product standards in terms of allowable emissions could potentially form part of Canada's emission reduction strategy, thus could potentially infringe on investors rights, and be open to arbitration.

Adding to this potential concern is *Pope and Talbot Inc. v. Government of Canada*, which was a dispute between the United States and Canada, centred on the implementation of the Softwood Lumber Agreement in 1996. This act included a limit on the amount of softwood lumber that could be exported to the United States from certain provinces and charged a fee on exports that exceed that limit. *Pope and Talbot Inc. v. Government of Canada* is important because, even though Canada was found not to have committed expropriation, the tribunal ruled that “creeping expropriation,” or a series of regulatory moves that incrementally eroded investor rights to profit from their investments, was indeed a valid position to base a claim on, as to do otherwise would leave huge holes in the investment regime (Cummings and Froehlich 2007, 119). The establishment of creeping expropriation, or “regulatory taking,” as a basis for a Chapter 11 claim, has implications for all government regulatory action, broadly speaking, and could be particularly relevant when dealing with emission reductions, given the enormous amount of money in oil and gas extraction and the high degree of foreign investment in the Canadian energy sector.

In *Methanex Corporation v. United States of America*, Methanex, a Canadian company, filed a Chapter 11 claim against the United States after the state of California banned a gasoline additive, MTBE, which was produced and imported by Methanex. In doing so, Methanex alleged that California acted in a discriminatory fashion, and that “a substantial portion of its share in the California and larger

US oxygenate market was taken by patently discriminatory measures handed over to the domestic ethanol industry” (Cummings and Froehlich 2007, 123). The complaint was dismissed, and the tribunal found that the ban did not amount to expropriation. Thus, there is certainly precedent that environmental regulation can pass an arbitral challenge intact, as long as it is found non-discriminatory. However, as the *Ethyl Corp* case showed, a government must be willing to defend its case in front of arbitration, which carries large up-front costs, and potentially exposes Canada to an unfavourable judgement, which can be costly, particularly with the huge profits of firms operating in the Canadian Energy Sector.

In *S.D. Myers v. Canada*, a temporary export ban on polychlorinated biphenyl (PCB) waste from Canada to the United States provoked the ire of S.D. Myers, an American company who exported PCB to the United States for disposal. S.D. Myers had sought, and received, exemption from the American Environmental Protection Agency to not enforce the import ban on PCBs. In response to this, Canada issued an Interim Order in 1995, and a Final Order in 1996, banning the export of PCBs to the United States. However, in 1997, Canada reversed its decision, and opened the border. The border remained open for a five-month period in 1997, at which point the EPA reinstated the import ban. S.D. Myers filed an arbitration claim against Canada, stating the Interim and Final order on exported PCB hindered its ability to operate in the Canadian market, and unduly favoured Canadian firms over foreign ones by shielding them from competition, as S.D. Myers' Ohio facility was closer than Canadian competitors to many sources of PCB, and was able to offer a lower price (Been 2002, 6). This violated NAFTA articles 1102 and 1105, which deal with National Treatment and Minimum Standard of Treatment respectively (Hornsby et al 2007, 291). However, the legality of these exemptions was unclear, and were related to Canada being a signatory of the Basel Convention, which limits the trans-border movement of hazardous material, while the United States was not, and whether this obligated Canada to dispose of PCBs within Canada (Been 2002, 6).

S.D. Myers noted a statement by the Minister of the Environment at the time who, at a meeting with representatives of the Canadian hazardous waste disposal industry, who in turn were lobbying for an export ban, commented that PCB ought to be processed and disposed of within Canada by Canadians, as proof of the protectionist rationale behind the ban (Been 2002, 7). This was followed by the release of a government document stating that PCB exports did not inherently constitute a threat to the environment (Hornsby et al 2007, 291). The tribunal found in favour of S.D. Myers, stating that there was “substantial evidence in the record that a wide range of officials in the Department of the Environment and the Department of Foreign Affairs and International Trade had recommended that the border be opened for export of PCBs and had advised that an Interim Order closing the border would violate NAFTA” (Been 2002, 7). The Canadian government was forced to repeal the ban, and pay compensation. This case provides precedent protecting against preferentially treating Canadian companies under the guise of environmental protection.

Incidentally, similar precedent bars governmental action on emissions when found to be in breach of the WTO. A provision in the Government of Ontario's Green Energy Act was ruled in violation of the General Agreement on Trade and Tariffs (GATT) by the WTO in 2012. This provision fused government support for low-carbon energy development with protectionism, by mandating that 60 percent of expenses from clean energy projects must be sourced from within the province (Harrison 2013, s101). This puts limits on governmental ability to foster a domestic renewable industry directly, as heavy-handed regulation to give advantage to Canadian industries in the emergent green energy sector runs the risk of exposing Canada to arbitration. This also means that other parties to trade agreements cannot give preferential treatment to their own nascent renewable industries at the expense of Canadian firms.¹¹

11 It should be noted that arbitral tribunals are ad-hoc and not necessarily obligated to draw upon precedent to ground their decisions, arbitrators and advocates for the disputing parties do draw upon previous jurisprudence to enunciate the logic of their arguments. Interestingly, jurisprudence is cited from very diverse sources, with ICSID cases having cited NAFTA decisions and vice-versa.

More recently, Lone Pine Resources Limited, an American Company, launch an arbitral claim against the Government of Canada, claiming that the revocation of permits to explore and develop shale gas formations near the St. Lawrence River by the Quebec Government constituted an unlawful expropriation of their expected profits (IAReporter 2013). This action stems from concerns of Quebec residents regarding the process of hydraulic fracturing (or “fracking”) and its impact on water quality. Similarly, in the future, concern about GHG emissions could spur federal or provincial governments to revoke or limit development permits and potentially could open Canada to arbitration. Lone Pine Resources Limited claimed Quebec triggered Canada's liability under NAFTA and that it has suffered an “expropriation without any compensation or accordance of 'international due process” and that “its legitimate expectations have been dashed, and a denial of justice perpetrated” (IAReporter 2013). Quebec, for its part, mandated that no compensation be paid.

A cap-and-trade system that encompasses all of the North America side-steps much of the risk of climate policy triggering an arbitral claim. The upstream cap-and-trade system proposed in later chapters is non-discriminatory, because all emissions would be covered, including fuel imports, and all firms regulated regardless of where ownership originates. As long as permits are not allocated in a fashion that favours Canadian businesses over foreign interests, it is unlikely that the emissions trading aspect of Canadian climate change policy would provide the basis for a successful arbitral claim.

However, complementary policies could be enacted at the national level that would conflict with NAFTA. Border tariffs to protect domestic trade-exposed industries would be an obvious violation of NAFTA rules. Outright banning certain high-carbon fuels or favouring low-carbon fuels that Canada has a clear competitive advantage in producing could be problematic as well. When California introduced its low-carbon fuel standard, Canadian Prime Minister Stephen Harper rattled sabres, saying that the policy was discriminatory against Canadian oil coming from the oil sands, which has a higher carbon content. No arbitral claim has been filed, but this situation is emblematic of the

tricky political terrain that policy-makers have to navigate. Forcing high-carbon energy facilities to close, desirable as it may be from an emissions perspective, could provoke an arbitral claim, if those facilities are foreign-owned. The fallout of Ontario's phase-out of coal-fired electricity (mentioned above) should prove instructive about potential arbitral responses to strong emissions regulations.

Investment agreements as facilitators of low-carbon investment

The most straight-forward way to limit the conflict between NAFTA and international agreements on emissions is to add the Copenhagen Accord (or a binding successor) to the list of agreements exempt from NAFTA rules under Article 1108, Reservations and Exceptions (Hornsby et al 2007, 294). Other environmental agreements have this status, including the Montreal Protocol, which deals with ozone depletion, and the Basel Convention on the Movement of Hazardous Waste, which limits the trans-border movement of hazardous waste, particularly transfers from developed to developing countries. While the addition of the Copenhagen Accord (or a successor to Kyoto) to Article 1108 might reduce tension between economic and environmental goals, it is a reactive measure.

Environmental critics of NAFTA, and international investment agreements generally, often state that trade liberalization leads to developed countries exporting dirty production to developing countries, who often have less stringent environmental regulation and less wealth, making it difficult for them to reject investment based on environmental criteria. This is sometimes referred to as the “pollution haven hypothesis” (MacDermott 2006, 3). Some state that trade liberalization is not the most important factor for firms making environmental investment decisions. Factors like business size, financial resources, customer expectations and other criteria were more relevant (Domínguez-Villalobos and Brown-Grossman 2007, 245). Finally, some state that, far from having a pollution-haven effect, trade and investment liberalization encourage the deployment and implementation of more energy-efficient, low-pollution technology. The reasoning behind this is that, as multinational corporations enter these markets, they bring with them more efficient and cost-efficiency technology,

which in turn leads to lowered emissions. This is known as the “pollution-halo” effect. However, the issue is not necessarily whether trade and investment agreements are inherently good or bad for environmental regulations. Rather, the issue is that trade and investment regimes have been integrated and made binding far faster than environmental regimes. Instead of looking at the investment regime as a wholly negative constraint on policy, we ought to examine how we can use investment regimes to encourage, to protect and to foster the development of the low-carbon economy. NAFTA already allows for some citizen pressure to be exerted upon the process via the JPAC, and NAFTA has provisions to allow renegotiation if parties agree to do so, thus citizens have an avenue to affect change in the investment regimes through their national governments.¹²

Boute notes that discussions on how to transition to a low-carbon economy often centre around issues of profitability, internalizing the carbon externality, and making low-emissions projects economically viable in comparison to fossil fuels, but rarely focus on mitigating the risk of low-carbon investing by creating a favourable investment regime (Boute 2012, 652). He argues that these investments are particularly vulnerable to state interference, as typically they derive a substantial amount of their economic viability from regulatory measures supporting low-carbon development. Boute observes that, in several cases in Europe, programs that subsidize or assist low-carbon development made attractive targets for cutbacks during times of austerity (Boute 2012, 624). Further, he notes that investment protection agreements serve to mitigate this risk by committing states not to renege or revoke supporting policies, lest they face potential arbitral action. Boute ends by recommending particular investment protection provisions be added to international climate change agreements, incorporating principles beneficial to low-carbon investment, detailed in various arbitral decisions. While Boute focuses on the Energy Charter Treaty, his recommendations could also apply to

12 NAFTA Article 2202 allows for renegotiation if agreed to by the parties and ratified within their respective legislative bodies (NAFTA article 2202, (<https://www.nafta-sec-alena.org/Default.aspx?tabid=97&ctl=SectionView&mid=1588&sid=d5a8ba07-1fb2-4f28-88d0-a8eac08611a2&language=en-US#A2205>)).

a renegotiation (or clarification) of NAFTA environmental principles, to remove arbitral uncertainty and encourage low-carbon investment. Haneman (2010) makes a similar point when discussing complementary regulatory measures, in addition to setting a price on carbon. He notes that price incentives alone are not enough to stimulate investment in projects with high capital costs. When discussing the development of technology like carbon-capture-and-storage (CCS), he states that there is both concern regarding future promises of support surrounding R&D that might be revoked or changed after investments have been made, and a high degree of coordination that must occur between multiple government and private-sector actors for the deployment of these technologies to be successful. A stable regulatory environment is also necessary for these high-risk ventures to seem attractive (Haneman 2010, 242).

Lin and Streck (2009) also discuss uncertainty in relation to low-carbon investment. Rather than focusing on typical investment agreements, as Boute did, they examined issues relating to the current Kyoto Protocol Clean Development Mechanism (CDM), which facilitates low-carbon investment in developing countries by allowing developed countries to count emissions reduced by the investment towards their Kyoto targets.¹³ They found that the opaque, inconsistent and slow operating style of the CDM Executive Board, the secretariat that manages the day-to-day operation and functions as the CDM's regulator, discouraged private actors from participating in CDM projects, and thus hampered its ability to encourage low-carbon development. The CDM Executive Board has final approval of CDM projects alone, and is responsible for permit disbursements, among other responsibilities. They put forth several recommendations to fix this and encourage buy-in from private finance. This included professionalizing the Executive Board to consist of people with experience in market regulation¹⁴, the formation of an appellate or review panel to give private actors recourse to

13 This is known as “offsetting,” which is a commonly included measure in cap-and-trade systems, which allows carbon-reducing investments in unregulated sectors or countries to apply to emissions limits in regulated ones. This is discussed in greater detail later.

14 Part of the legacy of the CDM EB being established as a UN committee and not as a professional regulatory body is that

challenge CDM decisions without going to national court, and finally rules relating to input, output and throughput legitimacy. Although Canada is no longer a party to the Kyoto Protocol, lessons learned from it and other carbon-trading schemes, such as the European Union carbon market, are instructive for Canadian policy-makers attempting to set up a carbon market in North America. Boute as well as Lin and Streck stress that predictable and transparent systems are an integral requirement for facilitating low-carbon investment.

While it is true that investment agreements can constrain certain governmental actions on climate change, it is also true that these agreements are not going anywhere. Rather than arguing in vain for their abolition, reasonable environmentalists must work to make investment agreements work for the environment rather than against it.

members serving on the EB are typically “officials from national environmental ministries or authorities” often the performing the dual roles of “being a member of the Executive Board as well as a UNFCCC focal point and climate negotiator” which can lead to “complex set of interests and objectives which do not always favour the efficient and effective implementation of the CDM. These conflicting interests add to the fact that members of the Board are often insufficiently qualified to assess the technical details or methodologies of CDM projects and are unfamiliar with the operations of markets and international trading.” Lin and Streck recommend recruiting people with experience in the areas of “ project finance, law, business management, and science.” (Lin and Streck 2009, 93).

Chapter Three: Policy Options for Canada

With the previous discussion in mind, we move on to examine policy options available to Canada. In this section, I will make the case for an upstream cap-and-trade system, with complementary measures targeting emissions that are difficult to lower with a price signal alone. This upstream system has a number of advantages over carbon taxes, intensity-based regimes, and downstream cap-and-trade systems.

Background analysis of emissions policies

Currently, Canada has announced its intention to regulate the top large final emitters (LFE's) with an intensity-based emissions trading scheme (Rivers and Jaccard 2010, 410). An intensity-based standard sets a maximum CO₂ limit per unit of production, rather than a cap on total emissions. The rationale behind this is that it allows industry to expand production without being impeded by an overall cap, and is rooted in concerns surrounding the potential negative impacts of regulations on GDP. This policy has been criticized in that it focuses “emissions pricing on large industrial emitters, which represent 10 to 15 percent of Canada's economic output and about half of its emissions. The remainder of the economy would not be exposed to a carbon price under proposed policy” (Jaccard and Rivers 2010, 416).

Breneau and Renzetti (2009) examine the intensity standards regime in Canada and compare it to a similar program in place in the United Kingdom. The two countries had proportionately similar reduction targets under the Kyoto Protocol. Given that the UK had met its requirements, and that Canada had not, Breneau and Renzetti endeavoured to find out why this was the case, and if Canada could learn from the UK's implementation of emissions policy. They examined the current proposed emissions intensity regime in Canada, and developed three models to test its effectiveness in increasing energy efficiency. In both Canada and the UK, they deconstructed aggregate emissions data in an effort

to determine whether reductions were being achieved via technological innovation or sectoral shifts towards low-carbon production. Canada had a much higher intensity per GDP than the UK and so, theoretically, would have more room for improvement. They found that the UK's intensity reductions were largely the result of fuel-switching, away from coal powered electricity generation towards natural gas. This switching accounted for 12% of their total 20% aggregate GHG reductions. It is unlikely that Canada could replicate this, as coal represents less than 11% of total energy use in Canada (Bruneau and Renzetti 2009, 14). Noting this, the authors turn towards the potential impact of the emissions intensity regime in Canada. Historically speaking, emissions intensities in many Canadian industrial sectors declined between 1990 and 2002, all while experiencing real economic growth of about 2.35% per annum. There were exceptions, however, with electricity production as well as oil and gas extraction seeing an increase in emissions intensity alongside economic growth, largely due to a shift towards heavier oil and bitumen production (Bruneau and Renzetti 2009, 9). Some of these reductions were due to technological innovation, but the authors note that most has been caused by a shift into sectors that generally emit less, rather than improvements on the techniques of production in energy-intensive sectors (Bruneau and Renzetti 2009, 11-12).

The authors move on to judging the impact of recently proposed federal intensity policies. They model three scenarios: “business-as-usual (BAU)”, intensity-targets with credits for previous actions, and intensity targets without credits for previous actions. They found that either intensity target scenario represented a dramatic improvement over the BAU scenario, with marginal emissions improvements favouring the no-credit scenario. Further, they applaud the fast implementation period of 18-21% intensity reductions in four years. However, they note that after that period, the 2% mandated annual reduction would essentially keep emissions at pace with real economic growth, limiting their usefulness in reversing climate change (Bruneau and Renzetti 2009, 18). This is partially due to the lack of a fixed cap on emissions, the fact that most of the economy aside from large emitters

would be left uncovered, and the low price placed on missed targets, as firms that fail to meet their targets can pay into a “technology fund” at \$15 per tonne, up to a significant portion of their total mandated targets. Intensity standards, while better than nothing, are insufficient to reduce GHG emissions meaningfully and stave off climate change.

The National Roundtable on the Environment and the Economy (NTREE) also examined a variety of policy packages for their effectiveness. They concluded that a strong price signal must be established on carbon nationally to foster technological innovation and to provide incentives to reduce GHG emissions. In comparing market-based policies, they stated that either an upstream cap-and-trade system, a downstream cap-and-trade with taxes and offsets, or an upstream carbon tax would be sufficient to bring Canada close to the emissions targets set in the government’s *Turning the Corner* climate policy package (NRTEE 2007, 24-6). These targets are set to 38% below 2006 levels by the year 2020 (Jaccard and Rivers 2010, 420). They note that, in either case, action is better taken sooner rather than later, to avoid greater costs in the future, as emissions stock will be higher, and capital stock will already be locked in past 2050, given the large amount of capital stock turnover expected around 2020-2025 (NRTEE 2007, 18).

In addition to being effective at reducing GHG emissions, as well as being administratively simpler than the downstream option, an upstream cap-and-trade system is more easily integrated into international carbon trading systems. With the permit system being levied at the source, at the producers of embodied carbon, such as unburnt coal, natural gas or oil, the system covers all potential emissions in Canada, whereas a downstream cap-and-trade system would, for administrative reasons, feasibly cover only the largest emitters in Canada. By covering embodied carbon, an upstream cap-and-trade better captures the true progress an area or sector is making towards reducing GHG emissions, and prevents “carbon leakage,” where emissions-producing activities are simply relocated from highly regulated jurisdictions to less regulated ones. For example, British Columbia currently

only accounts for the emissions released in its jurisdiction, which in turn paints a picture of positive climate progress. However, when one takes into account the large amount of coal exported by BC, the picture is both more accurate and less flattering (BC Ministry of Energy and Mines and Core Review, “Coal”).

A tax would lower emissions well enough. In a recent article, Elgie and McClay examine British Columbia's carbon tax, instituted in 2008, and note that per capita fuel consumption in BC declined at a rate 19% faster than the rest of Canada, while maintaining similar levels of growth (Elgie and McClay 2013, s3).¹⁵ However, as discussed above with the political ruin of the federal Liberal Party, taxes can be politically more challenging to sell domestically, and thus harder for trading partners to sell at home as well. Rhoades and Jaccard (2013) examine the climate policies enacted by the Government of British Columbia, focusing on two which have had some significance in limiting GHG emissions: the carbon tax and the clean electricity standard (CES). Their analysis is illustrative of the problems and trade-offs that are unavoidable when formulating emissions policy. Firstly, they present evidence about the impact of both the carbon tax and the CES. In their own words,

[w]e find that the clean electricity standard is estimated to reduce four to six times more emissions per year by 2020 than the carbon tax, but at an average cost per tonne of CO₂ reduced that is significantly higher than the carbon tax at its current level. Interestingly, the clean electricity standard achieves higher and steadier levels of public acceptance, which might be attributed to its lack of visibility, relative to the carbon tax (Rhoades and Jaccard 2013, s38).

These findings reinforce those of Harrison, mentioned in previous chapters, that part of a given policy's political acceptability hinge on how close its costs are to the individual citizen. Rhoades and Jaccard use a term from behavioural economics, “salience,” to describe this phenomenon. The higher salience a policy has, the higher it rates in the public consciousness. This can have both positive and

¹⁵ Elgie and McClay account for the economic downturn in their numbers by looking at the average fuel consumption prior to the introduction of the carbon tax (2000-08) and found that fuel use per capita in BC during that period declined 0.1% *less* than the rest of Canada, while the after the tax was instituted, fuel use in BC declined at a rate 5% *more* than the rest of Canada.

negative effects. The high level of public awareness that surrounded that carbon tax both made it an easy target for opportunistic political attacks from opposing political parties, as was the case in both BC and federally, but might have also contributed to its overall effectiveness, due to the fact that it increased the salience of the tax to the public, and thus influenced behaviour. Rhoades and Jaccard note studies that suggest that, in comparison to shifts in fuel prices by other means (non-emissions-related fuel tax, supply/demand fluctuation, etc), the carbon tax in BC was “four and one half times more salient than the equivalent change in gasoline prices” (Rhoades and Jaccard 2013, s41). Public awareness, it seems, is a double-edged sword. In terms of economic efficiency, a carbon tax is superior. Studies of the carbon tax's impact on competitiveness have shown that the revenue-neutral tax will have a net-positive effect on the economy by 2020 at current taxation levels (Rhoades and Jaccard 2013, s42). However, its political visibility greatly reduces its long-term viability, given that, in BC, the NDP latched onto repealing the tax as a key plank in their election platform in 2008, and the still-reigning Liberals have not mandated further tax-rate increases, likely fearing political repercussions (Tieleman 2009).

A cap-and-trade system allows for the development of a comparative advantage in low-carbon production, due to the fact that firms that introduce new, low-carbon production methods are rewarded by selling their permits for profit. This differs from how a carbon tax incentivizes low-carbon production: under a cap-and-trade system, firms may profit from their innovation, in money earned from permits sales, while carbon taxes only allow firms to avoid costs, lessening the amount of taxes they pay by reducing carbon. Further, this can allow for a lesser domestic burden if the price of GHG abatement is cheaper abroad than at home (NRTEE 2007, 29). An upstream system further addresses the issue of the exportation of embodied carbon not being accounted for in national emissions policy, and the integration with international markets minimizes the impact on Canadian energy producers and exporters. Sectors that are relatively inelastic can be addressed with supplementary policies, such as a

low-carbon fuel standard, which stipulates that fuel must have gradually less carbon-content at a regular interval, annually or otherwise (Sperling and Yeh, 2009), or increasing fuel efficiency standards for automobile engines. These regulations address the problem of elasticity, as they are not market-based policies aimed at changing consumer behaviour, but rather government-mandated regulations requiring reduced carbon.

Some authors, notably Niemeier et al (2008) have taken the concept of a downstream cap-and-trade and extended it further, from large final emitters to the end-users of energy, individual households. They examine California as a case-study, noting that the Market Advisory Committee (MAC), the committee created to examine various options to reduce GHG emissions in California, recommended some form of upstream cap-and-trade system. They argue that their end-user cap-and-trade system can deliver similar emissions reductions, while being more progressive for low-income houses, and more empowering for average people to actively play a part in reducing emissions, by allowing household-to household permit trading (Niemeier 2008, 3438). This would create an active role for the average person (or at least homeowner) and allow for some wealth redistribution towards low-income households, as typically they use less energy, and thus would have more spare permits than high-income households, who would have to purchase excess permits.

While Niemeier et al note the progressive nature and potential to reduce emissions of their scheme, they also recognize some difficulties. Issues surround proper distribution of permits, both in terms of the proper method of determining how many a given household should receive, whether based on per capita emissions, household size, number of residents or equally among households, regardless of size or occupancy. Each has issues in terms of feasibility and fairness. Further, at the household level, people have little choice as to where their energy comes from, and thus people in areas with higher-emissions energy sources, such as areas that rely on coal, would bear a disproportionate burden for choices outside of their control, or would be issued more permits, which would limit the usefulness

of the program. Also, people in hotter or colder areas will have different needs and thus require permits that vary monthly with their needs (Neimeier et al 2008, 3440-6). While all these issues can be worked out, by allowing utilities to trade permits between each other, this program looks to be very complicated administratively, and challenging to explain politically. Particularly in Canada, as mentioned above, it seems the most politically viable policy is the one that happens away from the day-to-day lives of citizens. Needing people to be actively involved in permit-trading, and also, having to deal with an annually reducing number of permits, might be challenging to enact and maintain. This system would also need to either be complemented by measures that cover emissions that occur outside of households, such as a tax or other trading scheme, or be expanded to include businesses and transport. Its administrative complexity must take into account household size, energy usage, income, location, and weather patterns, and allow for both household-to-household and utility-to-utility trading. But this complexity becomes more problematic when applied to national or international trading. Administrative challenges become greater and more complex further from the source. Ensuring one national or international cap on emissions is much simpler than attempting harmonize multiple sub-national standards across the NAFTA area.

In terms of administrative simplicity, an upstream cap-and-trade system is superior, in that fewer players are regulated, and thus fewer stakeholders must be brought into agreement. Most emissions are accounted for without additional measures (see below). While a broad carbon tax would be administratively the simplest option, permit trading under a cap-and-trade system would encourage development of low-carbon fuels sources internationally, as embodied carbon is covered and low carbon energy sources would be cheaper. Further, some research suggests a cap-and-trade system stimulates technological innovation and deployment better than a carbon tax, because it acts as both a performance standard *and* a price signal. This combination triggers important behavioural as well as economic incentives to lower emissions (Haneman 2010, 236). In his examination of the sulphur

dioxide (SO₂) trading regime that was introduced in the United States in 1995 via amendment to the Clean Air Act, Haneman notes that the functioning of the cap-and-trade system as a performance standard was arguably more important to SO₂ reductions than the emissions trading system. He noted firms tend to hold onto their permits and reduce their emissions via deploying scrubbers and other technology. Most trading happened intra-firm between different facilities.¹⁶ The cap-and-trade method was superior to both a fixed price on SO₂, and a stand-alone performance standard, as it allowed companies to shift SO₂ abatement to assets where it was most cost-effective (Haneman 2010, 233-4).

However, Haneman notes policy-makers must be aware of some key differences between SO₂ and CO₂ abatement. SO₂ emissions were largely produced by a small number of electrical utilities, which made them easier to regulate: CO₂ emissions are generated by a much more diverse and widespread set of actors. Further, SO₂ abatement was largely based on the implementation of already existing and proven technology, such as scrubbers. No analogous technology has been proven on a widespread commercial basis for CO₂. While carbon capture and storage technology is promising, it is currently very costly to retrofit old plants with it (Haneman 2010, 237). Thus, compared to the sulphur dioxide regime, GHG emissions require a more active regulatory approach.

While some of the problems Haneman identifies are alleviated by moving the point of regulation closer to the source, as this paper recommends, some persist. Technology was available and tested in 1995 that allowed plants to reduce their SO₂ emissions very rapidly at minimal cost, while this is still not the case for CO₂ today. CCS technology is a highly capital-intensive investment which may have a long-term payoff, and the private sector has been understandably slow in its development. Given the high capital stock turn-over expected between 2020 and 2025, the government must devote resources to making this technology viable for new plants to utilize quickly if it is to be utilized in

¹⁶ This does not raise the prospect of an intra-firm pricing problem as permits are either freely-distributed, which would limit the potential for price manipulation, or auctioned, at which point the cost would be the same regardless of where the permit was used.

replacement facilities (NRTEE 2007, 18).

Upstream cap-and-trade policy design

When designing cap-and-trade policy, the manner by which permits are initially allocated is important. Generally speaking, the choice is between grandfathering permits to firms based on historical emissions levels, by auctioning permits to firms annually, or by a mixture between the two.

Grandfathering permits entails regulators distributing permits to firms for free, with allocation based on the firm's historical emissions level. From there, firms would receive a decreased number of permits annually, thus lowering the total emissions each firm would be allowed to produce. Industry tends to prefer this approach, as the freely-allocated permits act as a windfall initially, giving firms a large quantity of saleable permits for nothing (Harrison 2012, 386). Grandfathered permits would ensure greater political buy-in from the business community, because they ensure that the firms are only paying the cost of abatement, as opposed to abatement plus a yearly tax. Indeed, grandfathered permits were a prominent part of the stillborn American *Clean Energy and Security Act* as part of a variety of policies aimed to secure buy-in from the business community, eventually tapering off to a mixed system, where 40% of permits are auctioned, and 60% are freely distributed (Center for Climate and Energy Solutions 2009).¹⁷

The downside to grandfathered permits is that the lack of revenue-generation limits the potential for government to counteract the more regressive consequences of pricing emissions, such as increased energy prices for low-income or disproportionately affected citizens (Goulder et al 2010, 162). This is assuming that revenue-neutrality is a political necessity, which it likely is. Revenue from selling permits could otherwise be used to invest in research, development, and infrastructure, further encouraging the transition to a low-carbon economy. Further, a high level of free allocations can distort market signals and create perverse incentives to keep older inefficient facilities operational in

¹⁷ The bill passed in the House, but died in the Senate (Government Printing Office, <http://www.gpo.gov/fdsys/search/pagedetails.action?packageId=BILLS-111hr2454pcs>)

order to capture more of the total permit allocation. This is contrary to the goal of any cap-and-trade program, and emissions policy generally, which is to reduce GHG emissions (Grubb and Neuhoff 2006, 15). A greater amount of free allocations runs the risk of highly visible clashes between government and various industrial sectors, where firms seeking to capture greater economic rents from newly created emissions markets hurl claims of unfair treatment and/or discrimination in comparison to competitors. These disputes, often highly publicized, can threaten the legitimacy of an emissions trading regime in the eyes of the public. Thus the greater the amount of free allocations, the greater pressure regulators will feel from industry lobbying (Grubb and Neuhoff 2006, 9). While a greater volume of free allocations would likely increase the political buy-in from business during the initial negotiation, policy-makers ought to be cautious when giving in to these demands, as it encourages greater rent-seeking behaviour, and could in turn create greater political and administrative challenges in the future. These include time, cost and effort in verifying reported emissions from firms, to avoid inflated claims on permits.

Auctioning off permits allows government more flexibility, even if revenue-neutrality is a political must, but at the cost of political acceptance among business. In this system, firms would bid on permits based on anticipated emissions levels in the coming year. The economic concern with selling permits, rather than awarding them for free, is that certain sectors of the economy would see a dramatic drop in profits, possibly encouraging capital flight and harming the economy.¹⁸ If grandfathering permits overcompensates firms for the potential economic harm caused by pricing emissions, and if auctioning 100% of permits overly burdens these firms, and thus leads to a drop in GDP, then the logical choice would be a mixture of the two. By setting aside a certain amount of permits to be distributed freely, and auctioning the rest, firms that would lose significant profits from total auctioning will be able to recoup some of their losses without jeopardizing the effectiveness of the

¹⁸ For a discussion of the potential for capital flight, referred to as “leakage”, in the EU trading system during the second compliance phase, see Antweiler and Gulati 2013.

cap-and-trade system at reducing emissions.

Recent studies suggest that the amount of freely distributed permits necessary to preserve profits is rather small (Goulder et al 2010, 162). Goulder et al use a general equilibrium model of the U.S. economy that allows for interactions between different sectors of the economy over time, and find that 100% auctioned permits result in significant profit losses for carbon intensive industries, while 100% freely allocated permits drastically over-compensate those same industries. Using this model, they note that, in their model, 86% of permits could be auctioned, requiring only 14% of permits to be freely-allocated for the purposes of limiting profit-loss (Goulder et al 2010, 171-2). Obviously, the American and Canadian economies are different, and further research is required to determine the precise percentage of freely-allocated permits required for the Canadian economy.

It should be noted that in terms of direct effectiveness in limiting emissions, auctioning and grandfathering are the same. The declining cap, not the trading, is what lowers emissions. The trading is designed to lower the costs associated with GHG abatement.

By auctioning off the majority of permits and freely allocating a minority, regulators can reduce profit loss in regulated firms, thus limiting the negative impact to the economy, while using the revenue from auctioned permits to lower the tax burden in other areas. This leads to greater economic efficiency, greater political buy-in from business (although likely not as much as would be the case if permits were 100% freely-allocated), and greater buy-in from voters, as revenues would be recycled back into the economy in ways that would be more visible to the electorate. A certain amount of free permits for new entrants to the market, if they met certain criteria, might also serve to spur low-carbon investment. However, this could potentially be seen as a direct subsidy to national industry under trade law, and policy-makers should resist the urge to favour Canadian businesses with free permits in order to avoid disputes.

Beyond concerns regarding the initial allocation of permits, other areas demand a careful

balance between economic imperatives and effective limits on emissions. An example of this is allowing the saving and borrowing of permits. These practices would lower the cost of abatement by allowing firms to acquire permits at a lower price, but they have the long-term impact of a slower, more even, decline in emissions (Goulder et al 2010, 174). The EU permit trading system did not allow for borrowing and saving of emissions, and in turn has suffered from a great deal of price volatility. This in turn challenged the ability of firms to plan for the future. As Grubb and Neuhoff note,

Price volatility carries a cost. Difficulties in predicting future allowance prices are delaying investment decisions. By waiting, a company can gain more knowledge about future CO₂ prices, and thereby make better decisions. Furthermore, in the presence of price uncertainty, risk aversion is also likely to reduce investment. The risk of low CO₂ prices represents a significant hurdle for low-carbon investments (Grubb and Neuhoff 2006, 14).¹⁹

Schott notes that permit saving and borrowing would have contributed greatly to stabilizing the market (Schott 2013, s122-3). Grubb and Neuhoff state that saving of permits would reduce price volatility and thus market uncertainty, but borrowing against future allowances might have the opposite effect (Grubb and Neuhoff 2006, 22). Thus this project recommends permit saving, but not borrowing.

Policy-makers must carefully balance economic concerns with effectiveness when designing the details of emissions policy. A portion of that balancing will come from the amount of permits initially given out. Part of the reason permit prices fell so drastically in the EU emissions trading regime was that the initial permit volume handed out by national governments was greater than the actual emission volume produced by industry. This is partially due to most European nations not having a developed carbon registry, which made determining baseline emissions challenging, and partially due to the majority of permits in the EU trading system being freely allocated, as opposed to auctioned (Schott 2013, s121). Research has shown that emissions projections often have an upward bias, and hence risk releasing too many permits (Grubb and Neuhoff 2006, 19). This is likely a smaller problem in North

¹⁹ Secondary markets, such as derivatives and hedge funds, are often viewed as mechanisms for reducing risk. It is beyond the scope of this thesis to examine all potential secondary financial instruments that could be brought to bear on emissions trading. Further research is required in this area.

America, as both Canada and the United States have fairly comprehensive emissions tracking systems. This information can be centralized to provide regulators with better information to set permit allocations. Further, auctioning permits will likely limit the potential for saturating the market with cheap permits, as business will likely be more cautious with emissions estimates if initial procurement of permits costs money. Minimum auction prices can also serve as a price floor to prevent permit prices from dropping too low, which in turn will provide the market with longer term pricing confidence when making decisions about low-carbon investments (Grubb and Neuhoff 2006, 22).²⁰

Another concern relating to price volatility within a cap-and-trade system is the price suddenly spiking too high and placing an undue burden on industry. Some have noted the potential for price ceilings and “safety valve” policies to limit price volatility (Grull and Taschini 2010, 110). Current proposed federal policy has a safety valve in the form of regulated firms paying into a technology fund to fulfil some of their commitments in lieu of reducing emissions (Rivers and Jaccard 2010, 410). As mentioned above, this policy is criticized for the very low price it places on carbon, at \$15 per tonne, which prevents the price from rising too high, but it also shields producers from the true cost of carbon, and thus lowers the effectiveness of the system in reducing emissions. However, a much higher price ceiling could be more effective in ensuring prices don't spike too high, while maintaining program effectiveness, if the price was much higher. However, the system this thesis proposes will likely suffer from much less fluctuation in price compared the EU system, due to the high degree of auctioning, and the banking of allowances.

As mentioned earlier, this project advocates for the empowerment of the CEC to monitor and regulate an upstream cap-and-trade system in the NAFTA region. In doing so, it would lower the cost of abatement for all involved and limit competitiveness concerns for business, by harmonizing

²⁰ Price volatility was a critical problem in the EU emissions trading system (ETS). In 2005, when emission reductions were verified for the first time under the ETS, it was discovered that there was an excess of permits compared to what was needed to cover emissions, which in turn caused the price to crash (Grubb and Neuhoff 2006, 13).

emissions standards in Canada and the United States. This project goes further and advocates that CEC determine the distribution of permits, rather than national or sub-national governments. This avoids some of the pitfalls of the EU trading system, such as imperfect information from which regulators decide permit allocation, as well as limiting the potential for states or overstate their emissions to get a larger portion of any grandfathered permits (Schott 2013, s121). Research indicates that many of the problems in the EU trading scheme could be partially ameliorated via a centralized distribution of permits by the European Commission, rather than by national governments (Grubb and Nuehoff 2006, 18).

Welfare and competitiveness

When designing public policy, the impacts of that policy on the general welfare and on competitiveness in international trade are important to keep in mind, and emissions policy is no different. An emissions regime is unlikely to get the required political buy-in from the public if it has (or is perceived to have) an unduly negative impact on employment or public welfare. A revenue-neutral approach to public policy, with the money raised by taxes or via selling permits being returned to people in some fashion, is oft-cited as a method of mitigating the potential harm of emissions policy on employment and welfare (Rhoades and Jaccard 2013; Simpson, Rivers and Jaccard 2008; Dissou and Sun 2013). If emissions policy is designed to be revenue-neutral, this can be achieved in a number of ways. In British Columbia, the revenue generated is returned via tax cuts and other benefits focused on mitigating the impact on segments of the population that might be disproportionately affected by increased fuel and energy prices, such as northern and rural homeowners, schools, and municipal governments for local efforts to reduce emissions (Rhoades and Jaccard 2013, s40). From a political standpoint, targeting visible centres of opposition for tax breaks makes sense. It ensures broader buy-in from voters, and also gives the appearance of responsiveness to the electorate. Also, it is fairer, as northern and rural communities have fewer alternatives to transport using fossil-fuel, due to less public

transit, a lower density population, a greater reliance on trucks and larger vehicles, as well as higher fuel needs for home heating.

Ideally, policies ought to be progressive in nature, or at least not regressive. The literature exhibits some concern over the impact of carbon-reducing policies on low-income households. Low-income houses spend a greater proportion of their total income on energy and fuel but use less energy (Niemeier 2008, 3442). As previously discussed, Niemeier's solution to this problem was to implement a downstream cap-and-trade at the household level, thus opening a potential benefit from permit trading for those in low-income situations, who could sell their excess permits to wealthier people, who tended to use more energy (Niemeier 2008, 3441).²¹ For reasons outlined in previous chapters, I argued that an upstream cap-and-trade system offered superior administrative feasibility and effectiveness. In this system, there is no potential for households to trade permits between each other, and thus redistribute wealth in that fashion.

One option is to take the revenue generated by emissions policy, either through taxes or permit-auctioning, and recycle it back into the economy through income tax rebates. These tax rebates could be greater for lower income households, which would lessen the burden on poorer members of society. Again, there are trade-offs between political acceptability and economic efficiency when designing policy. Progressive changes to personal income taxes, with greater benefits targeted at low-income earners through middle-class households, might have greater salience to those receiving the benefit, increasing buy-in, and having greater political benefit to government. While large lump-sum transfers, if properly communicated to those receiving them, might have political benefits, they may not be the best at increasing welfare.

Dissou and Sun (2012) model the potential impact of cap-and-trade regulations on welfare,

²¹ Low-income households use less energy because they generally cannot afford it. By selling their excess permits, Niemeier is suggesting that their use of less energy can be translated into a welfare-increasing benefit by monetizing their lesser carbon footprint.

focusing on employment and wage levels as metrics for measuring household welfare. They cite several studies that suggest that lump-sum transfers of wealth, such as income tax breaks/refunds, is less effective than reducing taxes collected, such as payroll taxes, at limiting the impacts on household employment and welfare. Using a general equilibrium model that accounts for labour market rigidity, they examine four scenarios of revenue recycling: lump-sum transfers to households, revenue being used to reduce payroll taxes for highly skilled labour alone, reductions in payroll taxes on unskilled labour alone, and reductions in payroll taxes for both skilled and unskilled labour equally. Their analysis shows that reducing payroll taxes for low-skill labour yields the most upward pressure on employment and wages, yielding greater welfare benefits (Dissou and Sun 2013, s61).

Policy-makers will need to make tough choices regarding the redistribution of revenues from permit-auctioning. Economically speaking, reducing payroll taxes for low-skilled workers seems to yield the most benefit. While the benefits of this policy are rooted in macro-economics, decreasing labour costs and thus ostensibly increasing output, the benefits are exceptionally diffuse, and politically difficult to capitalize upon. Large lump-sum payments, like income-tax breaks, may be more salient to voters, but less efficient economically. Finally, policy-makers may not want to make broad macro-economic redistribution the criteria for targeting revenue-recycling. Targeting revenues at groups that are, or are perceived to be, *disproportionately* impacted by policy might be more politically palatable. The example of British Columbia's carbon tax targeting northern and rural communities is instructive, as these communities may be either high income or low income, may or may not be impacted to a greater degree by higher fuel prices, but felt disadvantaged by the tax. Thus targeting ameliorative measures at these communities can make good sense, for political reasons, although it might limit the incentive to change their behaviour.

Work has been done by Rivers (2010) and others on mitigating the potential economic harm of GHG reduction policies. Rivers notes the highly trade-exposed nature of the Canadian economy as

making it particularly susceptible to a loss of competitiveness following the implementation of a carbon pricing scheme (Rivers 2010, 1093). Rivers discusses several policy options, such as partial or total exemptions for vulnerable industries; or recycling the revenue raised from carbon pricing, whether in the form of directed corporate or capital tax reductions, or via a per-unit subsidy on production or allocating emissions permits based on physical output for impacted industries, thereby creating an incentive to meet CO₂ targets without reducing production (Rivers 2010, 1097-9). Despite the declining importance of the primary sector relative to the service and knowledge sectors, Canada still exports substantial amounts of natural resources. Many of these exports, such as timber, petroleum products, and coal, have a significant impact on emissions. Therefore, competitiveness can be compromised if Canada regulates these industries and its trading partners do not. Of course, Canada could move out of these industries, but this project makes the case that Canada should look to its primary trading-partner, the United States, and the NAFTA region, to engage in a multilateral agreement to limit carbon and trade emissions permits, which would mitigate some competitiveness loss.

However, while the United States remains a preeminently important trade partner, Canada has embarked on a campaign to diversify its trade relations to include rising stars and world regions that compete with the US. Canada has recently ratified a bilateral investment treaty with China²², and negotiated a trade deal with the EU that would eliminate tariffs and non-tariff barriers, and foster freer trade between Canada and EU member states.²³ Therefore, while the United States is likely to remain Canada's most important trading partner, other non-NAFTA trading partners are likely to make up a non-trivial and growing percentage of Canadian trade. As the regime suggested here initially encompasses only the NAFTA states, competitiveness concerns will be most acute when discussing

22 Canada-China Foreign Investment Protection Act information viewable here: <http://www.international.gc.ca/trade-agreements-accords-commerciaux/agr-acc/fipa-apie/china-chine.aspx?lang=eng>

23 Information about the Canada-European Union Comprehensive Economic and Trade Agreement here: <http://actionplan.gc.ca/en/content/ceta-aecg/canada-eu-trade-agreement>

exports to non-NAFTA states. A total exemption for industries exporting to unregulated areas would likely lead to simple shift in where exports go, with dirtier fuels being exported outside of North America, and cleaner fuels shipped within. The trans-border nature of climate change makes this unacceptable, as Canada would still be contributing to climate change, by increasing emissions elsewhere.

If total exemption is undesirable from an effectiveness perspective, then perhaps the simplest way to make up for lost competitiveness would be a tariff and/or subsidy that would make Canadian exports more attractive abroad. However, any legislation that purports to do this would likely result in either retaliatory action from trading partners, or in litigation against Canada in front of an arbitral tribunal, if trade relations with that particular country were covered by a bilateral investment treaty, unless the tariffs were mutually negotiated for exposed industries. Again, while this may serve to limit reduced competitiveness, it also distorts the system by shielding producers and consumers from the true cost of CO₂.

In an upstream cap-and-trade system, regulation happens as close to where embodied carbon enters the economy as possible. This includes ports, which are the point-of-entry for imported carbon. Therefore, carbon coming into Canada will be as heavily regulated as carbon produced within Canada. Thus, Canadian producers will not be disadvantaged within the Canadian market. Rather, the competitiveness of Canadian exports to energy markets outside of the NAFTA region are at risk. Domestic changes in energy production may alter energy exports, and thus leakage will be less of an issue. If fuels heading outside the NAFTA trading area were fully subject to the emissions trading regime, as opposed to being exempt, the financial pressure might shift production over a number of years towards cleaner fuel exports, such as natural gas, or cleaner extractive and refining technologies across the board. In this way, regulation might support competitiveness of Canadian clean energy exports, as opposed to simply reducing competitiveness in dirty industries. Further, Canadian

regulation might impact the energy choices of other nations towards low-carbon fuels, or at least move Canadian firms to compete in lower-carbon markets. The potential to substitute coal exports to China with liquefied natural gas comes to mind.

In terms of impairing the competitiveness of sectors bearing increased costs as a result of environmental regulations, such as more expensive energy, some evidence suggests that the costs of compliance with environmental regulation are often overstated, and the benefits of compliance (innovation, less waste, reduced input material and energy, etc) often understated or wholly unconsidered. Porter and Linde (1995) challenge the broadly accepted assertion that environmental regulations will undoubtedly burden firms which will reduce their competitiveness. They note that in several cases, firms subjected to well-crafted environmental regulations actually became more competitive, offsetting compliance costs with savings derived from production-related innovations. They challenge econometric studies that assume firms are static entities that always make optimal choices aimed at maximum efficiency. Rather, they paint a picture of the firm that is arguably more realistic, with sizable internal barriers to innovation, including “highly incomplete information, organizational inertia and control problems reflecting the difficulty of aligning individual, group and corporate incentives” (Porter and Linde 1995, 99).

Given this firm model, they note that properly-crafted environmental regulations can be powerful enough to overcome organizational inertia and push firms into innovating, benefiting both themselves and society. As the trend towards low-carbon, low-waste production continues globally, firms governed by strong national environmental regulation will have a significant “first-mover” advantage as more states adopt stronger regulations regarding emissions and waste (Porter and Linde 1995, 104-5). Strong regulations could push firms in Canada and the United States to lead in low-carbon technology, making it cost-effective to pursue technologies such as carbon capture and storage

or integrated-cycle coal gasification technology,²⁴ which would become strikingly valuable in North America if emissions were effectively priced, given the abundance of coal in Canada and the United States. Further, innovations that centre on energy efficiency would lower input costs, and thus make Canadian firm more competitive.

In any case, by reserving a select number of permits to be freely distributed to firms that are disproportionately impacted by regulation, regulators can ease the burden on these businesses, offsetting potential profit losses through the value of emissions permits. While this may not totally offset the costs these firms face, it will mitigate some of them, and hopefully spur innovation that will be profitable. Bohringer and Alexeeva-Talebi (2013) partly support this conclusion. In examining competitiveness concerns about unilateral regional abatement schemes, they note that in favouring emissions-intensive trade-exposed industries (EITEs) with differential emissions pricing, policy-makers increase the burden on other sectors in the broader economy. Their research demonstrates that some price differentiation might prevent leakage and maintain sectoral competitiveness in global markets. But it also warns that, as differential pricing approaches total exemption the increased burden on the rest of the economy would have a negative net effect on national competitiveness (Bohringer and Alexeeva-Talebi 2013, 140-1). They noted that, in the case of the EU, this small concession would likely be enough to reduce leakage somewhat, as stated with Goulder et al. (2009) above, by minimizing profit loss for newly-regulated industry, but the difference would be marginal at higher pricing, and welfare differences would be limited.

This is consistent with our earlier discussion, above, of emission permit pricing and allocation, which determined that freely-allocating permits overcompensated regulated industries with a windfall, while auctioning off 100% of the total emissions permits has an undue impact on sectoral profits.

24 Integrated-cycle coal gasification technology transforms coal into liquified synthetic gas, which removes many impurities, such as sulphur and mercury, as well as lowering CO2 emissions. It can be further transformed into hydrogen gas, making it virtually carbon-free. For more information, see: <http://www.claverton-energy.com/integrated-gasification-combined-cycle-for-carbon-capture-storage.html>

Therefore, allocating a small portion of free permits to EITEs would be equivalent to the differential pricing, in that it partially reduces the financial burden faced by these firms, via a small allocation of free permits, as opposed to a lower price on permits, as Bohinger and Alexeeva-Tabebi put forward. In both cases, EITEs receive partial compensation for the impact regulation will have on profits.

Note that, in some instances, certain firms are surely to be winners and others losers under an emissions reduction regime. As regulation strengthens at home and abroad, industries that cannot innovate to reduce their emissions will suffer competitive losses to firms that can. Over time, the energy sector will broadly reorganize itself away from high-emissions fuel sources and towards low-emissions sources. Indeed, far from being an unavoidable downside of emissions policy, it is exactly the goal. To think that this could be accomplished without some friction would be naive.

Offsets

This section deals with offset programs, which are often included in some fashion in a cap-and-trade system. This project recommends against the inclusion of offsets in any prospective climate legislation.

Offset programs are designed to allow firms to meet part of their emissions targets by investing in projects that reduce emissions in other, often unregulated areas of the economy. This can include forestry management and preservation, including projects yielding future emissions reductions or projects in developing countries. The most prominent examples of offset programs would likely be the Joint Implementation (JI) and Clean Development Mechanisms (CDM) of the Kyoto Protocol, both of which generate Kyoto emissions credits for international clean investments (the latter in developed countries, the former in developing). A local Canadian example would be BC's Pacific Carbon Trust, which was intended to facilitate the Government of British Columbia's plan to be carbon neutral. These programs are intended to give public sector organizations (PSOs) additional flexibility in meeting their targets, allowing them to invest in external GHG-reduction projects when reducing their

own emissions might be more costly or prohibitive.

Generally, valid offsets must meet four criteria. Their emission reductions must be verifiable by third parties; quantifiable; permanent, in that emissions captured cannot be released later; and “additional”, meaning that reductions would not have occurred without offset funding (Schmidt 2009, a64).

Offset programs can be controversial. Questions arise over the actual utility of offset programs in combating climate change, such as whether an offset is really equivalent to a reduction, what ought to be considered a valid offset, and how much carbon is actually removed via offsetting activities. Some scholars have challenged the idea that offsets have a meaningful impact on climate change.²⁵ Climate change happens over decades and centuries, not years, and some have noted that it is challenging, if not impossible, to determine if a project truly offsets emissions over that time-frame.

Kevin Anderson, in his *Nature* op-ed on the CDM, notes,

“For an offset project to be genuinely low-carbon, it must guarantee that it does not stimulate further emissions over the subsequent century. Although standards and legislation around offsetting and the CDM sometimes consider 'carbon leakage' in the projects' early years, it is impossible to quantify with any meaningful level of certainty over the timeframes that matter. To do so would presume powers of prediction that could have foreseen the Internet and low-cost airlines following from Marconi's 1901 telegraph and the Wright brothers' 1903 maiden flight” (Anderson 2012)

Even if permanence could be determined over such long periods, project additionality poses problems. Firms have an incentive to claim all offsetting projects as additional, and not otherwise viable without offset funding. However, Wara and Victor have noted several projects funded by CDM that likely would have proceeded without offset funding (2008, 12-13). The BC Auditor-General's report on the Government of British Columbia's goal of carbon-neutrality criticized the Pacific Carbon Trust for not investing in credible offsets (OAG Report 2013, 20). In the report, the Auditor-General

²⁵ See Jaccard and Griffin 2011; Wara and Victor 2008; Gans 2007; Schapiro 2010; Anderson 2012, Van Kooten et al 2012.

noted that two projects, the “Darkwoods Forest Project” and the “Encana Underbalanced Drilling Project,” which received the majority of offset funding at the time of the report, could not demonstrate additionality. The former could not demonstrate that offset funding was the deciding factor in proceeding. The Nature Conservancy of Canada (NCC), a non-profit organization mandated with purchasing and conserving sensitive land, had decided to buy the Darkwoods forest in 2006, prior to the establishment of BC's offset regime. But the sale did not close until 2008, and a carbon offset feasibility study was only completed in 2009. This indicates that offset funding was not a significant factor in proceeding. Further, the report stated that the NCC did not use conservative baseline estimates in determining the total emissions that would be released if offset funding did not occur. Instead, the NCC submitted a scenario which had an unfeasibly aggressive “liquidation logger” purchase and log the majority of the forest rapidly. The Auditor-General determined that there were several social and regulatory reasons to think this scenario was exaggerated and unlikely, including backlash from the community, the preference of the seller to sell to a responsible buyer, and a legal obligation under the Federal *Ecogifts* program to conserve the land (OAG Report 2013, 21-24). Thus, the overstated deforestation estimates lead to the NCC capturing more offset revenue than they would have gained in a more conservative scenario.

Similarly, the Auditor-General found that the Encana Underbalanced Drilling Project failed to demonstrate additionality. In an underbalanced drilling project, pressure differentials between the natural gas deposit and the bore-hole causes natural gas to flow past the drill and into the atmosphere. The methane-rich natural gas replaces the more typically used nitrogen. Typically, this escaped methane would be flared (ignited) to convert it to less harmful CO₂. The Encana project applied for offset credits to capture the escaped gas altogether, and pump it into the pipeline. However, the Auditor-General's report noted that Encana had significant financial incentive to move ahead with the project, as the captured natural gas could be sold for significant profit (OAG Report 2013, 25).

As evidenced by the cases above, significant issues exist within offset programs regarding “free-riders,” firms or people claiming to need incentive to change behaviours that they have already changed, or were planning to change regardless. Offsetting programs have had some success in facilitating projects that reduce emissions. CDM investment was integral in pushing several refrigerant manufacturers to find methods of capturing and destroying HFC-23, a greenhouse gas 11,700 times more potent than CO₂. However, the sheer volume of credits generated by these projects created a perverse incentive to continue to produce, and subsequently dispose of, HFC-23, rather than finding ways to eliminate it from the production process all together (Wara and Victor 2008, 11).

Jaccard and Griffin note that the verification of offsets is subject to two significant challenges. First of these is the “asymmetric information” problem, where firms have a much greater knowledge of the emissions reduction potential of a given project, and withhold key information from auditors. This could lead auditors, based on incomplete information, to verify a project as additional, when it is not. Secondly, they note the “adverse selection” problem, which essentially states that when offset policies are put in place, even firms that do not need them will apply for them, making it likely that a percentage of them will be “free-riders” (Jaccard and Griffin 2011, 3-4).

Asymmetric information presents a significant problem for the verification of offsets. Auditors only have access to the information provided by project management. Project management only discloses information as required by auditors. Thus, key information may not be disclosed because auditors did not know to ask for it, and project management could have a financial incentive to ensure it remains undisclosed.

Further, a fundamental issue with offsets is that they are valued as equivalent to actual reductions, when, in fact, they have differential value in combating climate change. A reduction has immediate effect, in that there is less CO₂e in the air than there would have been under a business-as-usual scenario. An offset project can take years to have the same impact. Further, the impact of

emissions reductions now is greater than equivalent reductions in the future. This is due to the fact that “offset” emissions are generally still released, with the promise that they will be removed from the atmosphere later. This leaves a number of years during which these emissions still warm the planet. Further, climate change is no linear process. Rather a number of relevant ecological processes can result in positive feedback loops, where greenhouse gases in the atmosphere alter the climate to the point where other GHGs, stored in natural carbon sinks (permafrost, arctic ice, etc) are released. This further fuels climate change, and thereby the release of more GHGs. Thus, one tonne of CO₂e reduced now will have increased value in combating climate change. Put another way, future reductions have relatively discounted value.

Some have posited that “weighted offset” crediting, which adjusts the volume of credits a given project receives based on how quickly the offset removes GHGs from the atmosphere, offers a way to account for the lesser value of offsets as compared to reductions. Projects with near-term or immediate effect receive a lesser discount or even a multiplier on their offset credit issuance, while projects with more gradual impact receive larger discounts on credit issuance (François and Hamaide 2011, 32-33). Compared to simply disallowing projects that have longer-term impacts on atmospheric GHG levels, weighted offsets have a number of benefits. For example, reforestation, afforestation, and preventing deforestation have several environmental and sociological benefits beyond reducing emissions. Forests are host to many ecological processes apart from sequestering emissions, including providing animal habitat and preventing soil erosion. Deforestation has a relatively short-term impact on climate change as formerly sequestered emissions are released. Weighted offsets would provide funding to replant forests while accounting for the longer time-lines for reducing emissions that reforestation and afforestation have. That said, offsets included in any potential cap-and-trade system would not likely be weighted significantly enough to account for potential free-riders.

While allowing offsets could potentially reduce costs for business and provide funding to

protect areas of high ecological value, such as rainforests, they add a significant administrative burden to the system, and could significantly undermine the effectiveness of our cap-and-trade in reducing emissions. In a *Harper's* magazine interview, environmental expert Lambert Schneider, who served on a U.N. Panel on offset methodologies, states that up to 40% of projects approved by the CDM are non-additional (Schapiro 2010, 34). This means that either the offsets claimed did not actually happen -- the emissions that they were supposed to "offset" were simply released -- or that the reductions were non-additional and money was wasted that could have been invested in reducing emissions elsewhere. Thus, the negative aspects of including offsets far outweigh the positives. For all these reasons, this project recommends against them.

Complementary policies

Certain sectors are less responsive to changes in energy prices, notably personal transportation. Haneman examines the spike in US gas prices during the summer of 2007, a rise of 34 percent on average, the equivalent of placing a \$113 per tonne price on carbon (Haneman 2010, 246). Haneman notes total vehicle miles travelled in the United States fell by only 4.6 percent. While this demonstrates a greater elasticity than conventional wisdom would assume, it is still not a big or proportionate drop. Haneman also notes that the personal transportation sector is used to fluctuations in fuel prices. Most proposals for capping emissions would a price on carbon far lower than that: the current proposed Canadian intensity regime caps the additional price on carbon at \$15/tonne, and proposed pricing schedules between \$15 and \$30/tonne. To effectively deter marginal fuel consumption, complementary measures seem necessary. Haneman suggests options such as instituting a separate performance standard on suppliers of gas and diesel for personal transportation, similar to the low carbon fuel standard instituted in California, a fuel-efficiency standard for newly manufactured cars, or a sales-tax rebate at point-of-purchase for fuel-efficient, hybrid or electric cars (Haneman 2010, 246-7). Further government actions to limit GHG emissions in the personal transportation sector include investments in

public transportation and support for the expansion of charging facilities for electric cars.

Rather than attempting to manage auto emissions through mandated fuel-efficiency standards for new cars or through low-carbon fuel standards at the pump, some jurisdictions have taken to creating incentives for the purchase of fuel-efficient low-carbon vehicles. The most familiar of such incentives would be tax rebates on hybrid and electric vehicles. While looking into options to limit emissions in the automotive sector, Antweiler and Gulati (2013) note that targeting only hybrids and electric vehicles was inefficient and costly, as such programs often have many “free-riders,” or people who would have purchased a hybrid or electric vehicle regardless of the rebate.²⁶ Instead, they recommend what they refer to as a “feebate.” The feebate program would give a point-of-sale fee or a rebate depending on the fuel-efficiency of a vehicle, with fees or rebates increasing the further away from the “pivot point,” or point of equilibrium between fees and rebates (Antweiler and Gulati 2013, s86-88). The authors claim that a feebate would have fewer free-riders, could be designed as revenue-neutral as opposed to a pure subsidy, which is a cost to governments, and would function similarly to a fuel-tax on new vehicle purchases. This balance of fees and rebates would push people towards vehicles with better fuel-efficiency.

Rhoades and Jaccard (2013) noted that in British Columbia, the clean energy standard (CES) was effective at lowering emissions from electricity generation. Similar in some regards to the renewable portfolio standards that have been implemented in certain states in US, a CES differs in that it doesn't mandate specific types of energy production. Instead, it mandates that a percentage of energy generated in BC must come from zero-emission sources. While this can impose costs on energy producers, which makes this method less economically efficient than a carbon tax, it has been effective

²⁶ A free-rider is someone who derives benefits for nothing. Often, when the goal of policy is to change behaviour through incentives, a high percentage of free-riders is problematic. Another example of this would be tax-credits for purchasing transit passes. The goal of the policy is ostensibly to promote transit use. However, a tax-credit on transit passes is unlikely to push people out of their cars and on to transit, as the incentive is not great enough to offset the inconvenience. As a result, the people deriving the most benefit from the policy are those already riding public transit, thus not changing their behaviour.

at reducing emissions (Rhoades and Jaccard 2013, s44). Performance and portfolio standards have proven to be very effective at limiting emissions. Given their relatively high costs, they are best used selectively as complementary policies to target sectors of the economy that are unresponsive to broad price signals; they should not be the primary method of emissions reductions.

As mentioned earlier, a significant opportunity exists to restructure the Canadian energy sector without prematurely retiring large capital assets, because the energy sector anticipates a large amount of capital stock turn-over between 2020 and 2025 (NRTEE 2007, 18). Ideally, market-based policies, such as the cap-and-trade system, will push the market towards lower-carbon replacements for ageing infrastructure.

However, market-based policies are imperfect, and mistakes in policy construction sometimes can occur that limit their effectiveness in delivering short-term structural change. The overly generous allocation of permits in the EU emissions trading regime is evidence of this. If time grows short and action is not being taken fast enough, government might need to step in with regulation. Potential examples of this regulatory action include following Ontario's lead in phasing out coal-fired electricity generation, or mandating that CCS technology be included where possible in the oil and gas sector. Another provincial example to follow nationally would be British Columbia's phase-out of natural gas venting, scheduled to lead to a moratorium in 2016.

Forestry

As mentioned above, offsetting programs are oft-cited as tools to facilitate more sustainable forestry practices. That said, the serious issues with offsetting programs make direct regulation more efficient and effective. However, care must be taken to ensure this encouragement is non-discriminatory, and compliant with both NAFTA and the Canada-US Softwood Lumber Agreement. Forestry practices have a key role to play in combating climate change. On one hand, cutting down trees has a negative impact on emissions, as those trees release GHGs, as do the roots and topsoil that

cutting exposes. However, excess reductions in logging can have a negative carbon impact. If wood supply for housing significantly declined, housing developers would likely turn to concrete and steel, both of which are more carbon intensive than wood (Parfitt 2010, 14). Further, excess logging restriction combined with modern fire suppression leads to overgrown undergrowth in forests. This can lead to a greater risk of catastrophic forest fires, which can release more CO₂ than sustainable logging would. Also, older trees eventually become more susceptible to insect and pest infestation, which can spread to other healthy trees, killing them and releasing additional CO₂ and methane. In fact, according to Natural Resources Canada, only for 11 out of past 21 years have Canadian forests been net carbon sinks, with wide annual fluctuations largely attributed to forest-fires and pests (Natural Resources Canada 2013, 25). Therefore, sustainably managed logging practices can help to reduce emissions more than conservation alone by limiting the spread of pests and fire.

Provinces and territories have jurisdiction over 77% of Canadian forests, 16% are federally managed, and 7% privately owned. (Natural Resources Canada, n.d.). There is very little timber harvesting on federally controlled forest land. This makes sub-national initiatives to maximize forest carbon-sequestration potential of key importance. In Canada, provincial laws require harvested areas be successfully regenerated, generally within two years of harvesting (Natural Resources Canada 2013, 21-22).

Logged forests become net GHG contributors, and the transition to net carbon sinks is slow. If forest stands are not given enough time between logging, they will never sequester more carbon than they release. Thus, longer logging rotations are essential. Older trees have other benefits, aside from sequestering more carbon. When they are cut, older trees can be made into a wider range of solid wood products, which command a higher economic value. Solid wood also tends to get made into long-lasting products, such as housing, and continues to sequester carbon.²⁷ In British Columbia, changes

²⁷ GHGs are only released when wood is burned, decays or otherwise broken down. Solid wood construction has a greater capacity to continue to store carbon as compared to pulp, plywood or oriented strand boards.

were made to the building code in 2009 to encourage the use of wood in low- and mid-rise buildings by increasing the maximize height of wood-constructed buildings from four to six storeys. Similarly, the Quebec Federation of Municipalities passed a resolution with encouraged wood use in the construction of public buildings. Encouraging solid wood production therefore adds economic value and emission reduction benefits. According to the Canadian Council of Forest Ministers, “a typical North American wood-frame home contains 29 metric tonnes of carbon (Canadian Council of Forest Ministers, n.d.). Relevant innovations include the advent of cross-laminated timber (CLT), which “are multilayer wooden panels glued perpendicularly and pressed with a hydraulic or vacuum press,” and are much lighter than concrete but strong enough to support multistory structures. Further encouraging wood construction, Natural Resources Canada, along with regulatory agencies, is working to change the National Building Code of Canada to allow wooden structures of various occupancy categories to build up to six storeys high by 2015 (Natural Resources Canada 2013, 6).

The recent mountain pine beetle attacks have left a great deal of dead or dying wood in Canadian forests, particularly in British Columbia. According to Natural Resources Canada, “From 1998 to 2012, the mountain pine beetle killed about 18.3 million hectares of pine forests in British Columbia, resulting in a loss of 720 million cubic metres of timber – roughly 55% of the provinces commercial pine inventory” (Natural Resources Canada 2013, 18). This has led to initiatives to salvage the dying wood for commercial purposes, including expanded production of wood pellets for bio-energy projects. In 2007, BC exported 900,000 tonnes of wood pellets to the EU, accounting for 16% of the market there (Parfitt 2010, 44). Natural Resources Canada notes that the export value of wood pellets was \$208 million in 2012, and is expected to rapidly increase (Natural Resources Canada 2013, 37). While the salvaging of dead wood has economic and climate benefits, the expansion of wood-based bio-energy projects has the potential to have a negative net-impact on the carbon-balance.

Wood-based bio-energy is considered a “green” technology by some because, in the case of salvaged

wood, it displaces other energy sources and would have released methane if left to decay, and in the case of wood specifically harvested for bio-energy, that the emissions from burning the wood are offset by replanting trees (Parfitt 2011, 20). While the latter argument has been dealt with above, noting that trees planted take decades to reach their carbon sequestration potential, the former has some merit, with reservations. Using waste-wood to generate electricity for sawmills and other similar facilities is beneficial because, in doing so, it displaces fossil fuel, and prevents the wood from decaying and releasing methane. However, as much of this boom has been in response to the abundant dead wood left in the wake of the mountain pine beetle, questions exist about the long term viability tree-based bio-energy, when the stock of dead wood runs out. When this occurs, there will be pressure to award new forest tenures to bio-energy companies. This would have a negative impact on the carbon balance, as wood has a relatively low energy density, meaning that when burned for energy it releases about the same amount of greenhouse gases as coal (Parfitt 2010, 23). Thus, a wide scale adoption of cutting trees for energy is inadvisable from a climate-change perspective.

Overall, the largest contributors to increases in CO₂ output from forests have been fires and insect pests, and the contribution to climate change efforts made by forests, positive or negative, will largely be determined by our response to these forces. Investing in greater monitoring ability and fire-suppression capacity will pay dividends. While the pine beetle epidemic in BC has decreased, the beetle has spread eastwards into Alberta and northwards into the Northwest Territories. The extent of its spread will be determined by a number of factors, such as “its ability to survive the winter; its development during the summer; its interaction with natives and new host trees; the distribution of susceptible host trees; and effectiveness of control efforts within Alberta” (Natural Resources Canada 2013, 20). Research suggests that early detection and long-term sustained treatment are critical to limiting the spread of the beetle (Wulder et al 2009) as well as treating, at minimum 50% of the total affected trees in an infested area (Coggins et al 2010). Failing to halt the spread of pests like the

mountain pine beetle will have a lasting negative on our forests carbon sequestration potential.

Chapter Four: Conclusion

Climate change is a collective action problem that must be overcome, if we are to leave a better planet for future generations. Unfortunately, action to limit emissions and mitigate the worst potential consequences of a radically changing climate have been halting, inconsistent and often prey to hard-nosed negotiators and politicians focused on short-term goals. International negotiations, characterized by rhetoric and unmet targets, have largely failed to deliver meaningful emissions reductions. Perhaps Kyoto was doomed to fail as a globally comprehensive mechanism to encourage states to shift towards a low-carbon future. Perhaps its real benefit was to highlight climate change as an existential issue for humanity. Certainly, the attempt at a global treaty was ambitious and, combined with the work of the IPCC, brought climate change for a time to the forefront of public consciousness.

Despite the mounting evidence of increasingly negative consequences for Canada and the world, such actions as have been taken in Canada to curb emissions have been largely ineffectual. Chapter one discussed at length the constitutional issues surrounding climate legislation. This discussion encompassed the different “heads of power” from which federal and provincial governments could potentially derive constitutional authority to limit emissions. Provincially, authority derives from the constitutional provision giving the provinces the jurisdiction to develop their natural resources, as well as their jurisdiction over industrial development. Federally, potential heads of power include jurisdiction over trans-border issues, criminal law, negotiation of binding international agreements, issues of national dimension, and broad powers relating to “peace, order, and good government.” Finally, constitutional scholars note the importance of the “principle of subsidiarity,” which stipulates that, in areas of constitutional uncertainty, the level of government most able to effectively deal with an issue area ought to be the level of government granted jurisdiction.²⁸ From there, I made the argument

²⁸ It should be noted that this can conflict with the residual character of POGG, which would seemly grant the federal government jurisdiction in areas of constitutional uncertainty. However, as outlined above, this power has been limited by successive Supreme Court to limit the potential incursion on provincial authority.

that the federal government does indeed have jurisdiction, as the emergent, critical and trans-border nature of climate change necessitates strong national action to limit emissions effectively and prevent “leakage” of high-carbon production to jurisdictions with less stringent regulation. Further, only the federal government can negotiate the NAFTA-level cap-and-trade system that this project advocates.

Turning towards federal action on climate change, initial policy focused largely on voluntary covenants with industry and education programs for consumers. After this proved ineffectual and pressure mounted for stronger action, a new government proposed an intensity-based system, which mandated progressive and incremental improvements in energy efficiency for Canada's largest emitters. While this was an improvement over both voluntary initiatives and the business-as-usual scenario, the techniques used still fell well short of what was needed to avert climate disaster, or even to achieve its own targets.

Parallel to the domestic evolution of climate policy, Canada was deeply involved in international climate change negotiations, first as a trailblazer, but then as a laggard. From an initially proactive stance in the late 1980's, convening several important conferences on the subject, Canada fell behind as high-minded ideals were soon replaced by bargaining around issues of competitiveness, limits for developing countries, and inclusion of forest carbon sinks. Joining other members of the JUSSCANZ group, Canada advocated lighter targets and more flexible compliance mechanisms, often confronting the EU group, which advocated for stronger targets, and the G-77 group, which staunchly refused binding targets. Canada set its Kyoto goals unrealistically high, attempting to “one-up” the United States for political points abroad and at home. Eventually, Canada left Kyoto and adopted the Copenhagen Accord, a non-binding agreement that aligned its goals with those of the United States.

This project has suggested a continental approach might be the best bet for reducing emissions in North America more aggressively, given the already highly-integrated nature of the NAFTA region, particularly in the energy sector. The reason for this was to minimize competitiveness losses and to

reduce compliance costs by allowing access to a wider market. This project recommended an upstream cap-and-trade system for reasons of greater effectiveness at covering all emissions in the economy, administrative feasibility, and greater political acceptability.

The cap-and-trade system that this project proposes comes with a number of suggestions to improve its effectiveness over current experiments with analogous systems. These suggestions include auctioning the majority of permits, rather than grandfathering them based on historical emissions baselines. In doing so, this system sidesteps the herculean task of establishing and verifying baseline emission levels for regulated sectors, and instead simply allows business to purchase the permits to cover the emissions they anticipate needing. This eliminates the risk of inadvertently flooding the market with permits, causing a sharp price drop in price and thus limiting the system's effectiveness.

The money raised through permit auctions would be recycled back into the economy. Indeed, research suggests that revenue-neutrality is a political must for buy-in from both business and the general public. Several considerations were presented, including recycling based on maximum macro-economic efficiency for welfare and employment, and returning funds back to the provinces from which they were raised. Policy-makers must carefully balance the political optics of their decision with economic criteria. The remaining permits that are not auctioned off can be disbursed based on any number of criteria. These include mitigating lost profits for heavily impacted industry such as highly trade exposed sectors, or ones that would suffer immediate and undue burdens from climate legislation.

In examining potential measures to limit emission, this project offered substantial discussion relating to international investment agreements and how they might constrain governmental prerogative in this area. From this discussion, we determined that emissions policy must be non-discriminatory, have legitimate environmental goals, and not expropriate either directly or indirectly reasonably expected profits from foreign investments. At the same time, there is significant opportunity for investment agreements to support low-carbon investment, which generally relies upon governmental

support for its profitability and thus is at even greater risk through potential revocation of that support during lean times.

Finally, this project discussed several complementary policies to reduce emissions in sectors that are not covered or do not respond to the price signal generated by the cap-and-trade system, including offsets, measures to reduce emissions from personal transport and forestry.

Final Thoughts

Climate change policy is a minefield for policy-makers. Enacting meaningful legislation to reduce GHG emissions requires drafters to factor in a wide variety of issues and concerns, including political optics, constitutional tensions, economic efficiency, international relations, trade and investment law, administrative feasibility, and most importantly, effectiveness in emission reductions. It is particularly challenging given the long-term benefits of averting climate change are difficult to justify to people when the costs are more immediate.

The system outlined in this project was designed with all the above criteria in mind. As outlined earlier, several available policy options would reduce emissions, such as command-and-control legislation, a carbon tax, or a downstream cap-and-trade system. While each of these would be effective at limiting emissions, this project has shown that each of them has compensating weaknesses. This regime differs from other cap-and-trade systems, in that it makes fewer concessions to industry than currently implemented systems. This includes auctioned permits instead of free allocation, and disallowing the use of offsets. These changes, while likely to increase industry resistance, greatly increase the effectiveness and administrative feasibility of the system.

The most important part, though, is that action occurs sooner rather than later. Economic and human costs associated with climate change will mount as delays continue. If all encompassing agreements, such as Kyoto, fail to deliver due to lack of buy-in, and sub-national arrangements, like the WCI, are unable to meet the challenge, perhaps the continental approach, as pioneered by the EU, holds

the key to combating climate change meaningfully. Canada, like all nations, owes it to future generations to put aside our differences and act. Otherwise, we will be guilty of stealing the future from our children, and leaving a worse planet in our wake.

Works Cited:

- Anderson, Kevin. "The Inconvenient Truth of Carbon Offsets." *Nature* 484(7392) 04 Apr. 2012.
- Antweiler, Werner, and Sumeet Gulati. "Market-Based Policies for Green Motoring in Canada." *Canadian Public Policy* 39 (2013): s81-s94. Web. 7 Mar. 2014.
<<http://muse.jhu.edu/journals/cpp/summary/v039/39.2S.antweiler.html>>.
- BC Auditor General, "An Audit of Carbon-Neutral Government." March 2013.
<http://www.bcauditor.com/pubs/2013/report14/audit-carbon-neutral-government>
- BC Ministry of Energy and Mines and Core Review, "Coal."
<http://www.empr.gov.bc.ca/Mining/Geoscience/coal/Pages/default.aspx>
- Been, Vicki. "NAFTA's Investment Protections and the Division of Authority for Land Use and Environmental Controls." *Pace Environmental Law Review* 20.1 (2002): 1-44.
- Belanger, Alexis "Canadian Federalism in the Context of Combating Climate Change." *Constitutional Forum* 20.1 (2011): 21-31.
- Bohringer, Christoph, and Victoria Alexeeva-Talebi. "Unilateral Climate Policy and Competitiveness: Economic Implications of Differential Emission Pricing." *World Economy* (2013): 121-54. *Wiley Online Library*. 15 Mar. 2014. <[doi: 10.1111/j.1467-9701.2012.01470.x](https://doi.org/10.1111/j.1467-9701.2012.01470.x)>.
- Boute, Anatole. "Combating Climate Change through Investment Arbitration." *Fordham International Law Journal* 35 (2011-2012): 614-63.
- Brenton, Anthony "Great Powers' in Climate Politics." *Climate Policy* 13.5 (2013): 541-46. Print.
- Bruneau, Joel F., and Steven J. Renzetti. "Greenhouse Gas Intensity in Canada: A Look at Historical Trends." *Canadian Public Policy* 35.1 (2009): 1-20. *JSTOR*. Web. 7 Mar. 2014.
<<http://www.jstor.org/stable/40213398>>.
- Canadian Council of Forest Ministers, "Building Green."
http://www.sfmcanada.org/images/Publications/EN/Green%20Buildings_EN.pdf
- Carpentier, Chantal Line. "NAFTA and Its Environmental Side Agreement Trade and Foreign Investment in the Americas the Impact On Indigenous Peoples and the Environment): Taking Stock @ 11.(symposium." *Michigan State Journal of International Law* 14.2 (2006): 191-223. *HienOnline*.
- Chalifour, Nathalie J. "Making Federalism Work for Climate Change: Canada's Division of Powers over Carbon Taxes." *National Journal of Constitutional Law* 22.2 (2008): 119-213.

- Craft, Jonathan, and Michael Howlett. "Policy Capacity and the Ability to Adapt to Climate Change: Canadian and U.S. Case Studies." *Review of Policy Research* 30.1 (2013): 1-18.
- Center for Climate and Energy Solutions, "Distribution of Allowances under the Aces Act." N.p., Aug. 2009. Web. 20 July 2014. <<http://www.c2es.org/publications/distribution-allowances-under-aces-act>>.
- Coggins, Sam B., Nicholas C. Coops, Michael A. Wulder, Christopher W. Bater, and Stephanie M. Ortlepp. "Comparing the impacts of mitigation and non-mitigation on mountain pine beetle populations." *Journal of Environmental Management* 92 (2011): 112-20.
- Cumming, Joseph, and Robert Froehlich. "NAFTA Chapter XI and Canada's Environmental Sovereignty: Investment Flows, Article 1110 and Alberta's Water Act." *University of Toronto Faculty of Law Review* 65.2 (2007): 109-31
- Dissou, Yazid, and Qian Sun. "GHG Mitigation Policies and Employment: A CGE Analysis with Wage Rigidity and Application to Canada." *Canadian Public Policy* 39 (2013): s53-s65. Web. 7 Mar. 2014. <<http://muse.jhu.edu/journals/cpp/summary/v039/39.2S.dissou.html>>.
- Dominguez-Villalobos, Lilia, and Flor Brown-Grossman. "NAFTA's Impact On Business Environmental Decision Making." *Policy Studies Journal* 35.2 (2007): 245-63
- Elgie, Stewart, and Jessica McClay. "BC's Carbon Tax Shift Is Working Well After Four Years (Attention Ottawa)." *Canadian Public Policy* 39 (2013): s1-s10. Web. 7 Mar. 2014. <<http://muse.jhu.edu/journals/cpp/summary/v039/39.2S.elgie.html>>.
- Environment Canada, "Canada's Emissions Trends." (2013):
http://www.ec.gc.ca/ges-ghg/985F05FB-4744-4269-8C1A-D443F8A86814/1001-Canada%27s%20Emissions%20Trends%202013_e.pdf
- Environment Canada, "Greenhouse Gas Emissions by Province and Territory.", n.d. Web. 14 Aug. 2014. <<http://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=18F3BB9C-1>>.
- Natural Resources Canada, "The State of Canadian Forests." (2013):
<https://cfs.nrcan.gc.ca/publications?id=35191>
- Natural Resources Canada, "Legality and Sustainability,"
<http://www.nrcan.gc.ca/forests/canada/sustainable-forest-management/13303>
- Fertel, Camille, Oliver Bahn, Kathleen Vaillancourt, and Jean-Phillipe Waaub. "Canadian Energy and Climate Policies: A SWOT Analysis." *Energy Policy* 63 (2013): 1139-50.
- Fickling, Meera, and Jeffrey J. Schott. *NAFTA and Climate Change*. Washington: Peterson Institute of International Economics, 2010. Web.

- Francois, Melissa, and Bertrand Hamaide. "Certified Emission Reductions Weights for Improved CDM Projects." *Environmental Policy and Governance* 21 (2011): 31-41.
- Gans, Joshua S. "Do Voluntary Carbon Offsets Work?" Editorial. *Economists' Voice* (2007): 1-4.
- Giest, S., & Howlett, M. Multi-level Governance and Place-Based Policy-Making For Climate Change Adaptation: The European Experience and Lessons for British Columbia. *BC Studies*, (176) (2013), 133-145, 147-154, 199. Retrieved from <http://search.proquest.com.ezproxy.library.uvic.ca/docview/1281856931?accountid=14846>
- Goulder, Lawrence H., Marc A.C. Hafstead, and Michael Dworsky. "Impacts of Alternative Emissions Allowance Allocation Methods under a Federal Cap-and-trade Program." *Journal of Environmental Economics and Management* 60 (2010): 161-81. *ScienceDirect*. 7 Mar. 2014. <[doi:10.1016/j.jeem.2010.06.002](http://dx.doi.org/10.1016/j.jeem.2010.06.002)>.
- Government Printing Office. "H.R. 2454 (Pcs) - an Act to Create Clean Energy Jobs, Achieve Energy Independence, Reduce Global Warming Pollution and Transition to a Clean Energy Economy." Government Printing Office, n.d. Web. 31 July 2014. <<http://www.gpo.gov/fdsys/search/pagedetails.action?packageId=BILLS-111hr2454pcs>>.
- Grubb, Michael, and Karsten Neuhoff. "Allocation and Competitiveness in the Eu Emissions Trading Scheme: Policy Overview." *Climate Policy* 6.1 (2011): 7-30. Web. 17 Mar. 2014. <<http://dx.doi.org/10.1080/14693062.2006.9685586>>.
- Grull, Georg, and Luca Taschino. "Cap-and-trade Properties under Different Hybrid Scheme Designs." *Journal of Environmental Economics and Management* 61 (2011): 107-18. r
- Hanemann, Michael. "Cap-and-trade: A Sufficient or Necessary Condition for Emission Reduction?" *Oxford Review of Economic Policy* 26.2 (2010): 225-52. *Oxford Journals*. 7 Mar. 2014. <[doi:10.1093/oxrep/grq015](http://dx.doi.org/10.1093/oxrep/grq015)>.
- Harrison, Kathryn. "A Tale of Two Taxes: The Fate of Environmental Tax Reform in Canada." *Review of Policy Research* 29.3 (2012): 383-407. 7 Mar. 2014. <[doi:10.1111/j.1541-1338.2012.00565.x](http://dx.doi.org/10.1111/j.1541-1338.2012.00565.x)>
- Harrison, Kathryn. "Federalism and Climate Policy Innovation: A Critical Reassessment." *Canadian Public Policy* 39 (2013): s95-s108. Web. 7 Mar. 2014. <<http://muse.jhu.edu/journals/cpp/summary/v039/39.2S.harrison.html>>
- Hogg, Peter W. "Constitutional Authority Over Greenhouse Gas Emissions." *Alberta Law Review* 46.2 (2009): 507-20. Print.
- Hornsby, David J., Alastair J. S. Summerlee, and Kenneth B. Woodside. "NAFTA's Shadow Hangs Over Kyoto's Implementation." *Canadian Public Policy* 33.3 (2007): 285-97. Print.
- IAReporter, "Lone Pine Resources files NAFTA arbitration over revocation of fracking permit in

Quebec; broader claims also in offing,” (2013)
<http://www.iareporter.com.ezproxy.library.uvic.ca/articles/20131001>.

Intergovernmental Panel on Climate Change, “Summary for Policy-Makers,” (2013),
https://www.ipcc.ch/report/ar5/wg1/docs/review/WG1AR5-SPM_FOD_Final.pdf

Intergovernmental Panel on Climate Change, “Mitigation 2014: Summary for Policy-Makers,” (2014),
http://report.mitigation2014.org/spm/ipcc_wg3_ar5_summary-for-policymakers_approved.pdf

Integrated-cycle coal gasification, <http://www.claverton-energy.com/integrated-gasification-combined-cycle-for-carbon-capture-storage.html>

Jaccard, Mark, and Brian Griffin. “BC’s Carbon Neutral Public Sector: Too Good to Be True?” N.p., n.d. Web. 1st May 2014. <<http://www.sfu.ca/content/dam/sfu/pamr/pdfs/CarbonNeutral%20BC%20Govt%20Jaccard%20Griffin%20July%2015%202011.pdf>>.

Kellogg, Paul. “After Left Nationalism: The Future of Canadian Political Economy.” *Paper presented to the 2003 meetings of the Canadian Political Science Association* (2003). Retrieved from <http://www.cpsa-acsp.ca/paper-2003/kellogg.pdf>

Lin, Jolene, and Charlotte Streck. “Mobilising finance for climate change mitigation: private sector involvement in international carbon finance mechanisms.” *Melbourne Journal of International Law* 10.1 (2009): 70+. *LegalTrac*. Web. 7 Mar. 2014.

Liptak, Adam. “Justices Uphold Emission Limits On Big Industry.” *The New York Times*. N.p., 23 June 2014. Web. 20 July 2014. <<http://www.nytimes.com/2014/06/24/us/justices-with-limits-let-epa-curb-power-plant-gases.html>>.

Lucas, Alastair R. “Mythology, Fantasy and Federalism: Canadian Climate Change Policy and Law.” *Pacific McGeorge Global Business and Development Law Journal* 20.1 (2007): 41-59. Print.

Lucas, Alastair R., and Jenette Yearsley. “The Constitutionality of Federal Climate Change Legislation.” *Journal of Environmental Law and Practice* 4.15 (2012): 205-36. Print.

MacDermott, Raymond. “Trade Agreements and the Environment: An Industry Level Study for Nafta.” *Global Economy Journal* 6.3 (2006): 1-22

National Roundtable of the Environment and the Economy, “Getting to 2050: Canada's Transition to a Low-Emissions Future,” (2007):
<http://collectionsCanada.gc.ca/webarchives2/20130322142934/http://nrtee-trnee.ca/climate/getting-to-2050>.

NAFTA, Article 301 and 1100, <https://www.nafta-sec-alena.org/Default.aspx?tabid=97&ctl=SectionView&mid=1588&sid=2d3a1faf-08c1-4bec-81e3-dce96918011b&language=en-US>

- NAFTA, Article 2202, <https://www.nafta-sec-alena.org/Default.aspx?tabid=97&ctl=SectionView&mid=1588&sid=d5a8ba07-1fb2-4f28-88d0-a8eac08611a2&language=en-US#A2205>
- Newman, Dwight. "Changing Division of Powers Doctrine and the Emergent Principle of Subsidiarity." *Saskatchewan Law Review* 74.1 (2011): 21-31.
- Niemeier, D., Gregory Gould, Alex Karner, Mark Hixson, Brooke Bachmann, Carrie Okma, Ziv Lang, and David Heres Del Valle. "Rethinking Downstream Regulation: California's Opportunity to Engage Households in Reducing Greenhouse Gases." *Energy Policy* 36 (2008): 3436-47. *ScienceDirect*. . <[doi:10.1016/j.enpol.2008.04.024](https://doi.org/10.1016/j.enpol.2008.04.024)>. Web. Mar. 2014.
- Parfitt, Ben. "Managing BC's Forests for a Cooler Planet." *Canadian Centre For Policy Alternatives* (2010): 1-61.
- Phillips, Freedom-Kai. "Climate Change, Sustainable Development and Nafta: Regional Policy Harmonization as a Sound Basis for Sustainable Development." The Commission for Environmental Cooperation, n.d. Web. 22 July 2014. <http://www.cec.org/Storage/150/17596_Climate_Change,_Sustainable_Development_and_NAFTA_-_FK_Phillips.docx>.
- Porter, Michael E., and Claas van der Linde. "Toward a New Conception of the Environment-Competitiveness Relationship." *Journal of Economic Perspectives* 9.4 (1995): 97-118. *JSTOR*. Web. 13 Mar. 2014. <<http://www.jstor.org/stable/2138392>>.
- Price, David T., R.I. Alfaro, K.J. Brown, M.D. Flanagan, R.A. Fleming, E.H. Hogg, M.P. Girardin, T. Lakusta, M. Johnston, D.W. McKenney, J.H. Pedlar, T. Stratton, R.N. Sturrock, I.D. Thompson, J.A. Trofymow, and L.A. Venier. "Anticipating the Consequences of Climate Change for Canada's Boreal Forest Ecosystems." *Environmental Review* 21 (2013): 322-65.
- Rhodes, Ekaterina, and Mark Jaccard. "A Tale of Two Climate Policies: Political Economy of British Columbia's Carbon Tax and Clean Electricity Standard." *Canadian Public Policy* 39 (2013): s37-s51. Web. 7 Mar. 2014. <<http://muse.jhu.edu/journals/cpp/summary/v039/39.2S.rhodes.html>>.
- Rivers, Nic, and Mark Jaccard. "Intensity-Based Climate Change Policies in Canada." *Canadian Public Policy* 36.4 (2010): 409-28. *Jstor*. Web. 7 Mar. 2014. <<http://www.jstor.org/stable/25782104>>.
- Rivers, Nic. "Impacts of Climate Policy On the Competitiveness of Canadian Industry: How Big and How to Mitigate?" *Energy Economics* 32 (2010): 1092-4. *ScienceDirect*. 7 Mar. 2014. <[doi:10.1016/j.eneco.2010.01.003](https://doi.org/10.1016/j.eneco.2010.01.003)>.
- Rogelj, Joeri, and Malte Meinshausen. "Copenhagen Accord Pledges Are Paltry." *Nature* 464.7292 (2010): 1126-28. Print.

- Samson, Paul R. "Canadian Circumstances: The Evolution of Canada's Climate Change Policy." *Energy and Environment* 12.2 (2001): 199-215.
- Schapiro, Mark. "Conning the Climate." *Harper's* Feb. 2010: 31-39. Print.
- Schmidt, Charles W. "Carbon Offsets: Growing Pains in a Growing Market." *Environmental Health Perspectives* 117.2 (2009): a62-a69.
- Schott, Stephan. "Carbon Pricing Options for Canada." *Canadian Public Policy* 39 (2013): s109-s124. *Muse*. Web. 10 Mar. 2014. <<http://muse.jhu.edu/journals/cpp/summary/v039/39.2S.schott.html>>.
- Simpson, Jeffery, Mark Jaccard, and Nic Rivers. *Hot Air: Meeting Canada's Climate Change Challenge*. Toronto: Emblem, 2008. Print.
- Smith, Heather A. "Political Parties and Canadian Climate Change Policy." *International Journal* 61.1 (2008/9): 47-66. *JSTOR*. Web. 7 Mar. 2014. <<http://www.jstor.org/stable/40204451>>.
- Smith, Heather A. "Unwilling Internationalism or Strategic Internationalism? Canadian Climate Policy under the Conservative Government." *Canadian Foreign Policy*; 15.2 (2009): 57-77.
- Soja, Amber J., Nadezda M. Tchebakova, Nancy H.F. French, Michael D. Flanagan, Herman H. Shugart, Brian J. Stocks, Anatoly I. Sukninin, E.I. Parfenova, F. Stuart Chapin III, and Paul W. Stackhouse Jr. "Climate-Induced Boreal Forest Change: Predictions Versus Current Observations." *Global and Planetary Change* 56 (2007): 274-96. *ScienceDirect*. 7 Mar. 2014. <[doi:10.1016/j.gloplacha.2006.07.028](https://doi.org/10.1016/j.gloplacha.2006.07.028)>
- Sperling, Daniel and Sonia Yeh. "Low Carbon Fuel Standards." *Issues In Science & Technology* 25.2 (2009): 57-66. *Canadian Reference Centre*. Web. 7 Mar. 2014.
- Stern, Nicolas. "Stern Review On the Economics of Climate Change, Executive Summary." (2010) Web. 24 May 2014. http://webarchive.nationalarchives.gov.uk/20100418065537/equalities.gov.uk/stern_review.aspx
- Tieleman, Bill. "Axe the Gas Tax Won Votes for Ndp." *TheTyee.ca*, 16 June 2009. Web. 14 Aug. 2014. <<http://thetyee.ca/Views/2009/06/16/AxeTheGasWonVotes/>>.
- Van Kooten, G. Cornelis, Tim Bogle, and Frans P. De Vries. "Rent Seeking and the Smoke and Mirrors Game in the Creation of Forest Sector Carbon Credits: An Example from British Columbia." *Resource Economics and Policy Analysis Research Group* (2012): 1-37.
- Wara, Michael W., and David G. Victor. "A Realistic Policy On International Carbon Offsets." *PESD Working Paper #74* (2008): 5-24. Print.
- Wulder, Michael A, Stephanie M. Ortlepp, Joanne C. White, Nicholas C. Coops, and Sam B. Coggins. "Monitoring the Impacts of Mountain Pine Beetle Mitigation." *Forest Ecology and Management*

258 (2009): 1181-87.