Environmental Policy Transformations and Canada at 150

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Like all policy areas, environmental, energy, and natural resources policies have transformed significantly during Canada's history. These policy evolutions are a result of changing values and knowledge. In addition, four underlying features of Canadian policy (federal, provincial and territorial) have strongly influenced energy and environmental policy, and to a lesser extent, natural resources policy. These features are the division of powers between the federal and provincial governments over natural resources; the regional nature of natural resource endowments; the United States' prominence as a trading partner; and the fact that the Constitution is silent on the environment.[1]

The division of powers means that provinces have control over their natural resources[2], while the federal government regulates trade and offshore development. This overlapping jurisdiction has historically led to interjurisdictional and interregional tension. The regional nature of natural resource endowments—and in particular energy endowments—has led to significant policy divergence between federal or provincial policies, and between policy actions of individual provinces. At times, federal policy has benefitted one region at the expense of another. The regional endowments have also significantly affected economic development, which in turn influences policy direction. The United States' dominance as Canada's trading partner has resulted in considerable policy cooperation between the two nations. However, this strong economic relationship means there are many instances where Canada is reluctant to engage in policy action without the cooperation of the United States. Finally, the Constitution's silence on the environment means the environment is another area of shared jurisdiction among Canadian governments, with the associated tensions that entails.[3] All these combined mean energy and environmental policy and politics in Canada have been, and continue to be, controversial.[4]

More recently, Canadian energy and environmental policy has become inextricably intertwined. Central themes of modern policy discussion and development include protecting the environment, debate about whether Canada's continued use and production of fossil fuels is sustainable, and using energy policy to achieve environmental goals. With this in mind, the rest of this chapter will explore the issue of climate policy as Canada's preeminent environmental policy challenge, which is likely to define energy and environmental policy for the foreseeable future.

Current and Future Policy Challenges

In terms of environmental policy, first and foremost in the minds of many Canadians is the challenge of climate change and the appropriate response to climate change at the national and subnational levels. Climate policies vary by jurisdiction: in addition to the national emissions reduction target, the majority of provinces and territories have their own targets, with varying stringency. The federal backstop carbon price notwithstanding, each province and territory also has its own approach to achieving its emissions targets. The approaches differ in pace, stringency, amount of overall policy action, and the level of political will. For example, while Alberta introduced a broad-based carbon tax in 2017, a significant concern of Albertans is the costs of the tax (and other policies) on emissions-intensive and trade-exposed sectors of the economy, and the associated leakage of economic activity and greenhouse gas emissions to other jurisdictions. This prompted a second policy, the Carbon Competitiveness Incentive (introduced at the end of 2017), which gives firms defined as emissions-intensive and trade-exposed emissions credits based on facility production and a product- or facility-specific emissions benchmark.[5]

The environmental economics literature offers some insight into the political and policy challenges facing Canadian governments in their response to climate change.[6] Broadly speaking, there are three types of environmental problems (in economics parlance, market failures) that justify government intervention: externalities, which are direct, unintentional, and uncompensated consequences imposed on others that

are external to the decision process of the actor; public goods, which are goods shared by all and owned by no one; and the tragedy of the commons[7], which describes individually rational actions that result in a socially undesirable outcome. The issue of climate change and the anthropogenic emissions that contribute to climate change can be expressed as all or any of these three classic environmental problems. For externalities, production processes (and human activity more generally) create emissions as a by-product, with negative consequences locally and globally. For public goods, the environment (clean atmosphere, biodiversity, etc.) itself can be considered a public good; social benefits are greater than individual private benefits, leading to under-provision of environmental quality[8] and free-riding. And for the tragedy of the commons, each country benefits from reducing greenhouse gas emissions and reducing the concentration of greenhouse gasses (GHGs) in the atmosphere, thereby reducing the probability of dangerous climate change. However, because each country's efforts to reduce emissions benefit the rest of the world and is costly to itself, governments have strong incentives to freeride on the efforts of others.

Differences between private and social benefits, or private and social costs, give rise to these market failures and create scope for government intervention. Again, the environmental literature gives insight into the appropriate (market-based) government action to correct each environmental problem.[9] In the case of positive or negative externalities, getting prices right through taxes or subsidies means that actors imposing consequences on others will internalize the cost (benefit) of those consequences and achieve the socially optimal outcome. In the case of environmental quality as a public good, the incentive to free ride means there is effectively no market demand curve for pollution control. The role of government policy is to fill in this missing demand curve, via requiring a fixed quantity of pollution control or setting a fixed price on pollution. Finally, for the tragedy of the commons, the role for government is to assign property rights over the "commons." In the case of the environment, government can, for example, allocate the right to pollute through emissions permits. However, it is important to note that both the undersupply of public goods and the tragedy of the commons are collective action problems: a group as a whole is better off if all contribute to the common good, but each individual (person or state) has an incentive to freeride.

This emphasizes the political difficulty of implementing policy changes to address the challenge of climate change, especially in interjurisdictional or multinational discussions.

Until recently, a fundamental question in Canada was whether concrete action should be taken at all.[10] This was in recognition of the fact that Canada was and is a marginal contributor to global greenhouse gas emissions, contributing only 1.9 percent of global emissions in 2005 and 1.6 percent in 2013.[11] A second consideration is that recent research suggests some countries—particularly wealthy ones—will benefit from some amount of global warming via increased economic productivity; Canada is one of these.[12] That is not to say that climate change will not be costly to Canada; the National Roundtable on the Environment and the Economy estimated that the economic costs of climate change in Canada (in 2006 dollars) would be CAD $5 billion annually in 2020, increasing to between $21 and $43 billion per year in 2050.[13] A third consideration is the costs Canada will impose on itself to meet its 2030 target of 523 million tonnes of CO_2-equivalent (CO_2e) emissions, or 30 percent below 2005 emissions, and subsequent targets. Reducing emissions, whether by pricing, regulation, or other policy mechanisms, is costly. Based on Canada's 2015 emissions intensity of 0.35 million tonnes CO_2e per billion dollars of GDP, meeting Canada's 2030 target without reducing the emissions intensity of output would require shrinking the Canadian economy by 28 percent. This is an unreasonable scenario, but it underscores the challenge Canada faces in balancing emissions reductions and maintaining economic growth and prosperity. The required emission intensity change to meet the target, with a 1.7 percent economic growth rate, is from 0.35 to 0.19 million tonnes CO_2e per billion dollars of GDP.

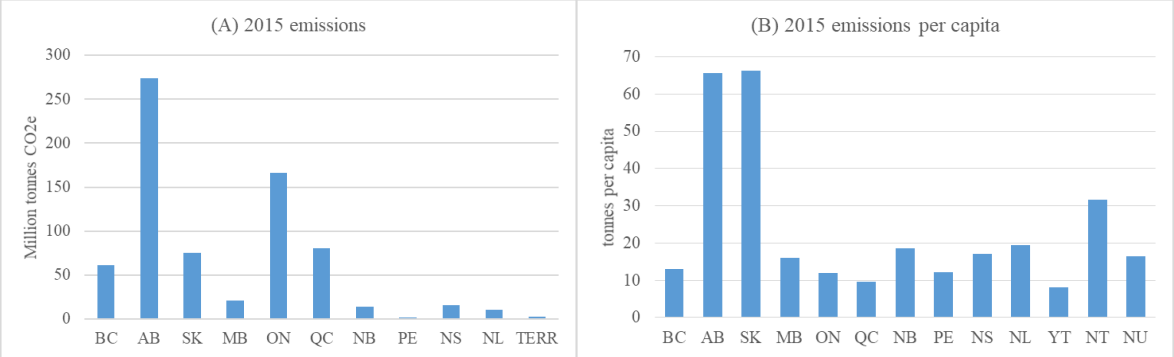
A fourth consideration is the distribution of burden across provinces and territories. As Figure 1 shows, there are substantial differences in emissions—both gross and per capita—across provinces and territories. Higher-emission jurisdictions will necessarily bear a higher burden of emissions reductions, even in the presence of neutral policy which treats all sources of emissions the same. This will have corresponding impacts on economic activity, with consequences for the distribution of burden. Policy

design has an important role to play to minimize these costs, particularly when considering the role of revenue raised through climate policies.[14]

A fifth policy issue is competitiveness and carbon leakage. Implementing carbon pricing or emissions reduction regulations will expose portions of the Canadian economy to higher costs not faced by competitors, making Canadian firms less competitive globally. As a result, economic activity could decrease or relocate to international jurisdictions, imposing economic costs on Canada and potentially increasing overall global emissions, depending on the environmental regulations in place in other jurisdictions which absorb the economic activity. The emissions intensity and trade exposure[15] of industries is a primary determinant of potential competitiveness impacts from climate policy.[16] In the absence of similar policy action from other jurisdictions, stringent climate policies in Canada will have high costs and little benefit. The major impacts can be mitigated by output-based pricing schemes such as the one implemented in Alberta in late 2017 or the scheme included in the federal backstop. A related concern is that emissions-intensive and trade-exposed sectors are concentrated in Alberta, Saskatchewan and to a lesser extent, Manitoba. This exacerbates the issue of burden-sharing and overall impact on specific provincial economies.

The issues described above underscore the collective action problem the globe faces; this collective action problem is replicated and exacerbated in subnational jurisdictions like provinces, where the benefits of action are even more diffuse. The combination of Canada's limited ability to affect global emissions and the minimal actions taken by other countries means the choice to engage in policies to reduce emissions is primarily a moral one. That said, it behooves Canadians to ensure their governments enact the most cost-effective policy solutions to this challenge, in order to meet environmental policy objectives with the least cost to the Canadian economy.

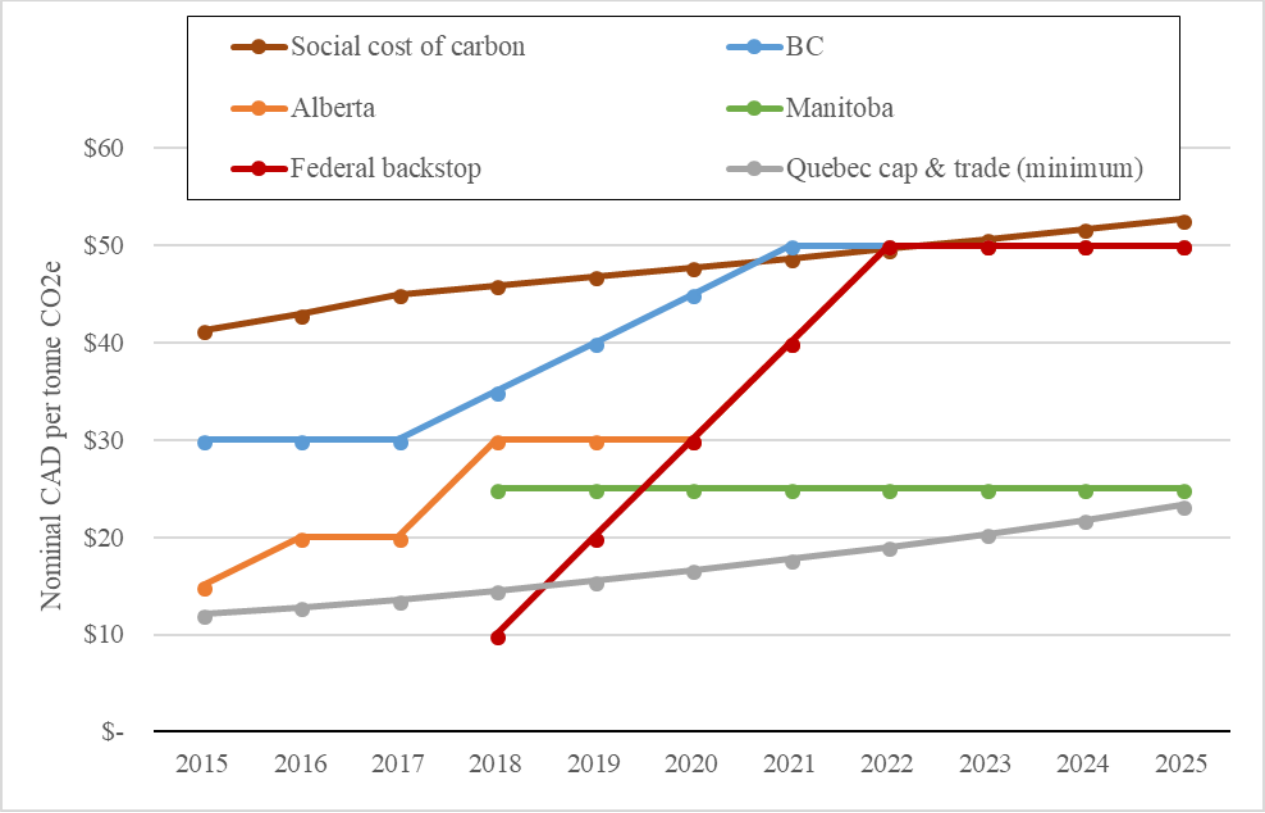
Figure 1: Total and Per Capita Emissions, by Province and Territory, 2015[17]



More recently, the policy debate has turned to how much action Canada should take, and the stringency of the resultant policies, given what other countries are doing (or not). The considerations driving these policy choices are the same as those enumerated above for whether to even act. In 2009, the National Roundtable on the Environment and the Economy estimated that in order to meet Canada's 2020 and 2050 targets (20 percent and 65 percent below 2006 levels, respectively), the national carbon price would need to be CAD $50 per tonne of CO_2e in 2015, rising to $100 in 2020, and $200 after 2025.[18] More recent modelling suggests the price needs to start at CAD $30 per tonne, increasing to $200 by 2030, and ultimately to $300 to meet the 2050 target.[19] A 2016 study indicates a nation-wide carbon tax of CAD $30 per tonne in 2016, rising to $110 in 2030, will leave Canada 50 to 80 million tonnes short of its 2030 target.[20] Current carbon pricing, shown in Figure 2, is below this threshold, though in line with estimates of the social cost of carbon by 2022. The social cost of carbon is a dollar measure of the incremental damages per tonne of increased emissions globally (or, correspondingly, the incremental benefit per tonne of decreased emissions). Of note is that in 2016, Environment and Climate Change Canada estimated the social cost of carbon to be CAD $55 per tonne (2012 dollars) in 2030 and $75 in 2050 (2012 dollars), both below the price required to meet Canada's targets.[21] This demonstrates the clear policy gap between goals and actions, which will need to be addressed either through increasing carbon prices to meet the 2020 and 2030 targets, introducing additional (and likely more costly) complementary policies[22], purchasing international offsets, a combination of all three options, or giving up on emissions reduction

targets as a policy goal. Current modelling by Environment and Climate Change Canada suggests that the Pan Canadian Framework—which includes the carbon tax and regulatory changes—will result in emissions of 567 million tonnes of CO_2e in 2030; the additional 44 million tonne reduction to meet the target will come from other policy actions.[23]

Figure 2: Current Canadian Carbon Pricing Policies, 2015 – 2025[24]



Conclusions

Canada is taking increasingly stringent actions in its efforts to reduce emissions and prevent climate change. With few exceptions, market-based policies such as carbon taxes or cap-and-trade systems are the best way to approach this problem. And while there is a role for additional complementary policies, not all policies are created equal; we must guard ourselves against the temptation to enact policies that are politically popular (or at least politically more popular) but more costly and less transparent. This is

particularly important when thinking about election cycles and the political acceptability of climate policy such as carbon taxes. At the end of the day, Canadians should focus on the environmental problems we are trying to solve, and design policy instruments that address each problem individually.

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[1] Jennifer Winter, "Making Energy Policy: The Canadian Experience," in *Meeting the Paris Mandate: A Cross-National Comparison of Energy Policy-Making*, ed. Patrice Geoffron, Lorna A. Greening, and Raphael Heffron (Springer-Verlag, forthcoming).

[2] Water is an area of shared federal-provincial jurisdiction; see Government of Canada, "Water governance and legislation: shared responsibility," https://www.canada.ca/en/environment-climate-change/services/water-overview/governance-legislation/shared-responsibility.html (accessed July 15, 2018).

[3] The fact the environment is not included in the Constitution also means that any federal or provincial environmental actions must fit within the defined constitutional limits, or limits determined through the courts. This is why Saskatchewan's constitutional challenge of the federal backstop is unlikely to be successful; see Nathalie Chalifour and Elgie Stewart, "Brad Wall's Carbon-Pricing Fight Is Constitutional Hot Air," *The Globe and Mail*, June 14, 2017, https://www.theglobeandmail.com/opinion/brad-walls-carbon-pricing-fight-is-constitutional-hot-air/article35297947/. This is also an interesting example of a province using opposition to a federal policy action to expand its jurisdiction.

[4] See G. Bruce Doern and Monica Gattinger, *Power Switch: Energy Regulatory Governance in the Twenty-First Century* (Toronto: University of Toronto Press, 2003).

[55] For an overview of the principles behind these output based subsidies, see Sarah Dobson, G. Kent Fellows, Trevor Tombe, and Jennifer Winter, "The Ground Rules for Effective OBAs: Principles for Addressing Carbon-Pricing Competitiveness Concerns through the Use of Output-Based Allocations," *The School of Public Policy Publications* 10, no. 17 (2017): 1–25. For specific details on the system itself, see Government of Alberta, "Carbon Competitiveness Incentive Regulation," accessed May 10, 2018, https://www.alberta.ca/carbon-competitiveness-incentive-regulation.aspx.

[6] See Nathaniel O. Keohane and Sheila M. Olmstead, *Markets and the Environment*, 2nd ed. (Washington, D.C.: Island Press, 2016).

[7] This concept was introduced by William Forster Lloyd in 1833, and made mainstream by Garrett Hardin, "The Tragedy of the Commons," *Science* 162 (December 1968): 1243-1248.

[8] The quality of the environment can be thought of as a good like any other. Alternatively, the environment can be thought of as a good, while the quality of the environment is a valued characteristic that can be under-provided (quality is lower than desired).

[9] While market-based policies are not always appropriate, in the vast majority of circumstances they will be the lowest cost and most effective policy instruments. For more detail, see Keohane and Olmstead, *Markets and the Environment*, chapters 8 and 9.

[10] It is important to note that despite perception that the Harper government took little or no action on the environmental file, there was policy change through regulation. These regulatory changes, however, did little to lower emissions and were insufficient to meet Canada's emission reduction targets.

[11] See Environment and Climate Change Canada, "Global Greenhouse Gas Emissions," March 16, 2012, https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/global-greenhouse-gas-emissions.html.
[12] See Marshall Burke, Solomon M. Hsiang, and Edward Miguel, "Global Non-Linear Effect of Temperature on Economic Production," *Nature* 527, no. 7577 (November 2015): 235–39.
[13] See National Round Table on the Environment and the Economy (Canada), "Paying the Price: The Economic Impacts of Climate Change for Canada," Climate Prosperity (Ottawa, 2011), http://nrt-trn.ca/climate/climate-prosperity/the-economic-impacts-of-climate-change-for-canada/paying-the-price.
[14] For more on this, see Canada's Ecofiscal Commission, "Choose Wisely: Options and Trade-Offs in Recycling Carbon Pricing Revenues," April 2016, https://ecofiscal.ca/reports/choose-wisely-options-trade-offs-recycling-carbon-pricing-revenues/; Dale Beugin, Richard Lipsey, Christopher Ragan, France St-Hilaire, and Vincent Thivierge, "Provincial Carbon Pricing and Household Fairness" (Canada's Ecofiscal Commission, April 2016), https://ecofiscal.ca/reports/provincial-carbon-pricing-household-fairness/; and Sarah Dobson and G. Kent Fellows, "Big and Little Feet: A Comparison of Provincial Level Consumption- and Production-Based Emissions Footprints," *The School of Public Policy Publications* 10, no. 23 (September 2017): 1–43.
[15] Trade exposure typically refers to how much firms trade with other jurisdictions, as trade limits their ability to pass increased costs along to customers.
[16] For more detail, see Dobson et al., "The Ground Rules for Effective OBAs"; Beugin et al., "Provincial Carbon Pricing and Household Fairness"; Dave Sawyer and Seton Stiebert, "Output-Based Pricing: Theory and Practice in the Canadian Context" (Canada's Ecofiscal Commission and EnviroEconomics, December 2017), https://ecofiscal.ca/reports/output-based-pricing-theory-practice-canadian-context/.
[17] Environment and Climate Change Canada, *National Inventory Report 1990-2016: Greenhouse Gas Sources and Sinks in Canada* (Ottawa: 2018), https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/inventory.html; Statistics Canada Government of Canada, "CANSIM - 051-0001 - Estimates of Population, by Age Group and Sex for July 1, Canada, Provinces and Territories," October 31, 2017, http://www5.statcan.gc.ca/cansim/a26?lang=eng&id=510001.
[18] See National Round Table on the Environment and the Economy, "Achieving 2050: A Carbon Pricing Policy for Canada" (Ottawa, 2009), http://nrt-trn.ca/wp-content/uploads/2011/08/carbon-pricing-advisory-note-eng.pdf.
[19] See Mark Jaccard, Mikaela Hein, and Tiffany Vass, "Is Win-Win Possible? Can Canada's Government Achieve Its Paris Commitment... and Get Re-Elected?" *School of Resource and Environmental Management*, Simon Fraser University (September 2016): 1-33. http://rem-main.rem.sfu.ca/papers/jaccard/Jaccard-Hein-Vass%20CdnClimatePol%20EMRG-REM-SFU%20Sep%2020%202016.pdf.
[20] See Chris Bataille and Dave Sawyer, "Canadian Carbon Pricing Pathways: The Economic and Emission Outcomes of Leading Policies" (Deep Decarbonization Pathways Canada and Canadians for Clean Prosperity, September 2016), https://drive.google.com/file/d/0B9FT5KrVwYmwY3A2RlpasTDM0N2M/view.
[21] Environment and Climate Change's estimates of the social cost of carbon are global, rather than the cost of Canada of marginal emissions. See Environment and Climate Change Canada. 2016. "Technical Update to Environment and Climate Change Canada's Social Cost of

Greenhouse Gas Estimates." March. Accessed December 29, 2017. http://ec.gc.ca/cc/default.asp?lang=En&n=BE705779-1.

[22] For more detail on the role of complementary policies, see Ragan, Chris, Elizabeth Beale, Paul Boothe, Mel Cappe, Bev Dahlby, Don Drummond, Stewart Elgie, et al. 2017. *Supporting Carbon Pricing: How to identify policies that genuinely complement an economy-wide carbon price.* Canada's Ecofiscal Commission. https://ecofiscal.ca/reports/supporting-carbon-pricing-complementary-policies/.

[23] See Environment and Climate Change Canada. 2017. "National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada." https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/inventory.html.

[24] Inflation of 2 percent assumed for the cap and trade minimum and social cost of carbon.