

2016

Carbon Policy Transfer: Learning Across Borders

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Carbon Policy Transfer: Learning Across Borders

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November 2016

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EXECUTIVE SUMMARY

Given the failure of the federal governments of the U.S. and Canada to pass national carbon policy, the learning and dissemination of carbon policy in innovative states becomes increasingly important. This paper seeks to understand international carbon policy transfer, focusing on the cross-border dialogues between British Columbia and Washington State as a case study. The authors apply policy transfer literature to determine how knowledge and experience with carbon policy in British Columbia influences carbon policy considerations in Washington. The methodologies used were interviews with primary policy actors and qualitative coding of interviews, key reports, websites, blogs, and articles. The research reveals that the method for carbon policy implementation- either public initiative or legislative- shapes the policy learning process, including who participates, the salient topics discussed, and the timing of the implementation process. The case study results show that emergent groups, which form explicitly to get carbon policy passed, played key roles in the carbon policy dialogue. The discussions that have taken place in Washington as it considers a carbon policy are both similar and different than the discussion that took place in British Columbia when the province passed its carbon tax. These results show that rational policy actors can come to different conclusions regarding which policy is most appropriate for a jurisdiction. This paper contributes to both policy transfer theory and an understanding of how carbon policies can be transferred between subnational jurisdictions.

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ACKNOWLEDGEMENTS

This research was supported by the Border Policy Research Institute at Western Washington University. The authors thank Kathryn Harrison, Chris Davis, and Yoram Bauman for agreeing to be interviewed for this research.

1. INTRODUCTION

British Columbia (BC) became the standard-bearer for carbon taxation in North America upon implementing its carbon tax in 2008. It covers virtually all carbon emissions in the province and taxes them at a rate higher than any other jurisdiction in the Western Hemisphere. Policy congruence between BC and Washington has long been recognized as mutually beneficial. There are several institutions and initiatives that work to build policy consistency across western states and BC. Political leadership in both entities has supported and continues to support carbon pricing. Given the importance of climate change as an economic and environmental issue for both BC and Washington, the relatively positive experience BC has had with its carbon tax, and the support of Governor Jay Inslee, Washington is ostensibly closer than ever to pricing carbon.

Four separate market-based approaches for reducing GHG emissions have been proposed in Washington. The first was Governor Inslee's bid to introduce a state-wide emissions trading system in 2015. The Carbon Pollution Accountability Act (CPAA) would have established a cap and trade system on par with that presently in place in California. This Act was unable to get through committee in the state legislature. The second is the regulatory Clean Air Rule that the Department of Ecology is presently writing at the request of the Governor. The third is a ballot initiative assembled by the NGO called "Carbon Washington" (CarbonWA), which will implement a carbon tax modeled off of the tax in British Columbia. The CarbonWA initiative will be voted on in November 2016. The fourth is another ballot initiative being developed by the Alliance for Jobs and Clean Energy. This is a collaborative of nonprofits. It originally supported the CPAA, but it has not supported the initiative by CarbonWA. The Alliance announced it would spend 2016 developing a ballot initiative of its own, probably for the 2017 election.

Policy transfer theory predicts that states with consistent ideologies are more prone to learning from each other's policy experiences and adopting similar policies. The theory has centered its attention either on transfer of policy among American states or among European Union members. There have been no studies of carbon policy or studies where an American state learns from a Canadian province.

Given British Columbia's eight years of experience with a carbon tax, its proximity to Washington, and the ideological commonalities among the populations, it is reasonable to expect that Washington state policy actors would draw heavily on learning from the BC experience when formulating a carbon pricing policy. However, Governor Inslee's carbon cap and trade system and the Department of Ecology's Clean Air Rule do not mimic or even seem to learn from the BC experience. At the same time, the CarbonWA initiative is directly descended from the BC carbon tax. These policy initiatives in Washington offer a rich opportunity to contribute new insights to policy transfer theory. This paper documents cross-border dialogues between Washington and British Columbia regarding carbon pricing and uses policy transfer and lesson drawing methodologies to evaluate the extent that features of the tax are transferable to the state.

2. CARBON PRICING

As a byproduct of burning fossil fuels, carbon dioxide and a host of other pollutants are emitted into the atmosphere. Several of these pollutants are already regulated by the Environmental Protection Agency (EPA) under the Clean Air Act because they affect human and ecosystem health, but carbon dioxide is not yet regulated, although the Supreme Court did rule in 2007 that EPA had the authority to do so. Carbon dioxide is a long-lived greenhouse gas that is primarily responsible for the increased absorption of solar radiation, the warming of the atmosphere and oceans and acidification of the oceans. All of these effects are associated with strong net negative costs. There are modest positive benefits of CO₂ as well due to increased plant (agriculture and silviculture) productivity. Since none of the costs or benefits are reflected in the market price of the fossil fuels, they are considered “externalities.” Other pollutants associated with fossil fuel consumption – namely oxides of sulfur and nitrogen – have been successfully regulated by a cap and trade system set up by the Clean Air Act Amendments of 1990. The cap and trade system has been widely recognized as successfully reducing SO_x emissions at a low cost. In essence, cap and trade establishes an artificial price to pollute. Because of the success of the sulfur dioxide cap and trade system, and the strong concern to reduce carbon dioxide emissions, cap and trade and other carbon pricing systems have been suggested as key policy approaches to mitigating and adapting to climate change.

2.1 THEORY

The notion of taxing undesirable consequences from free market transactions that affect individuals not party to the agreement (a negative externality) is attributed to Arthur Pigou in his most influential work, *The Economics of Welfare*, published in 1920. The concept has been a rallying cry for economists in their advocacy for free market measures to address the environmental impacts imposed by industries, households, and governments across the globe (Mankiw 2009). The logic follows elementary economics that raising the cost (and thereby the price) of any outcome reduces the aggregate quantity of that outcome, assuming all else remains constant. Conversely, decreasing the cost of any outcome will yield more of that outcome. Hence, Pigou suggested that policy makers could encourage positive externalities by subsidizing the costs and discourage the negative ones by taxing them. In the jargon of economists, the correct policy would set a tax to internalize the external costs of the outcome. If the action in question is a coal power generation facility that freely emits carbon, the tax per ton¹ of coal should be equal to the *social cost*² of carbon emitted per ton of coal. That would internalize the external costs of coal generation, thereby aligning the interests of the industry and society.

In 2010 the EPA began calculating the Social Cost of Carbon (Newbold et al. 2010), which places a dollar value on a marginal metric ton of CO₂ emissions or CO₂ equivalents (CO₂eq). Those costs include the changes due to climate change in net agricultural productivity, human health, and property damage, to name a few. Carbon costs correspond to the year that the emission occurs and the discount rate used to

¹ In this paper all tonnes are metric. 1 metric tonne = 1.10 short ton.

² According to the US EPA, the social cost of carbon dioxide (SC-CO₂) is meant to be a comprehensive estimate of climate change damages and includes changes in net agricultural productivity, human health, property damages from increased flood risk, and changes in energy system costs, such as reduced costs for heating and increased costs for air conditioning. (Source: <https://www3.epa.gov/climatechange/EPAactivities/economics/scc.html>)

express future damages in present value terms.³ There are also considerable uncertainties in the computations. For 2015 EPA reports the social cost of CO₂ to be between \$11-105 per metric ton of CO₂ emitted (EPA 2015). This relates to the amount of damage one ton of CO₂ would incur over its lifetime. Since economists assume that future damages are of less value to people today, future costs are discounted. The further in the future the costs are realized, the less they matter to people living today. So, even though CO₂ remains an active greenhouse gas for over 100,000 years, the costs to us today are under \$100/ton.

Returning to our example of the coal plant, assume the coal is being sourced from the Powder River Basin in Wyoming and thus emits 1.87 tons CO₂ per ton of coal combusted for power generation.⁴ If we work from a social cost of CO₂ price of \$39/ton, then we can financially mitigate the external costs of one ton of coal by levying a \$72.93 fee per ton of coal burned. This approach is a market-based mechanism for reducing GHG emissions that seeks to align the private costs of an action with the implicit social costs of that action. So-called sin taxes on alcohol and cigarettes are common policy manifestations of taxing externalities.⁵

Economists cite price-based mechanisms as the least costly method of GHG abatement, favored over command and control regulations, subsidies, or information programs. A price-based mechanism is any that levies a direct and involuntary cost on GHG emissions. Facing these increased costs, emitters can elect to invest in more efficient technologies, reduce their actions partly or all together, or continue to operate as usual. Alternative technologies become more economically viable relative to those that feature greater pollution (e.g. wind power vs. coal, hybrid vehicle vs. traditional sedan) when costs are imposed on emissions. The academic literature began recommending these policies in the 1960s and 70s (Pearce 2002). Governments across the globe have traditionally relied on command and control, subsidies, and information programs for environmental regulation, much to the chagrin of economists (Mankiw 2009, Rivers & Jaccard 2005, Jaccard & Rivers 2007). Today, economists generally agree that economy-wide carbon pricing systems will be required to achieve significant GHG reductions in a cost-effective manner (Stavins 2010: 16).

2.2 POLICY DESIGNS

There are two market-based policy approaches that governments most often consider to reach their emissions reduction targets. The first is a tax on greenhouse gas emissions, typically referred to as a carbon tax. The money generated from a revenue-positive tax could be used for various purposes, such as to compensate fossil fuel consumers for increased costs, to fund energy efficiency projects, or whatever other purposes the legislature determines. If a tax were revenue-neutral, then all of the revenues would either be given directly back to citizens or used to reduce existing undesired taxes (Revelle, 2009).⁶

³ A greater discount rate decreases the Social Cost of Carbon, *ceteris paribus*.

⁴ Key assumptions are that PRB coal contains 8,800 Btu/lb and there is an emission factor of 212.7lbs of CO₂ per mmBtu (million Btu) (EIA 1994).

⁵ The externality associated with these choices is increased expected health care costs of the individual that are subsidized by others in the form insurance pools.

⁶ Recently, Premier Rachel Notley of Alberta used the term “revenue neutrality” in a very different way. She said: “We will put every penny raised through the carbon price to work here in Alberta — building our economy, creating jobs, and doubling down on efforts to reduce pollution and promote greater efficiency. The Alberta

The second policy approach considered by governments is a cap-and-trade system where a regulatory body sets a cap on the maximum quantity of pollution that a specified group of entities are allowed to emit. This quantity is divided into emissions allowances that are allocated to the entities that generate emissions with each allowance designating a quantity of emissions. Allowances are bought and sold with the other regulated entities in an established market. Theory holds that an entity faced with costly emissions reductions would decide to purchase allowances from an entity that is able to reduce their emissions at a lower cost.⁷ Allowances are bought and sold among the market participants, granting flexibility in a firm's ability to pollute, however, total emissions should never exceed the overall cap set by the regulatory body (Stavins 2008: 4).

The fundamental difference between the two is that a carbon tax fixes the cost of emitting a ton of pollutant while cap and trade fixes the quantity of pollution that can be emitted. A carbon tax is attractive to industry since it makes the compliance costs certain, while cap and trade is attractive to those who want climate mitigation to be certain. Conversely, the cost of emitting is uncertain in a cap and trade system as the price of emission allowances is determined in a marketplace. Setting a price ceiling can only come at the expense of adding uncertainty to the mass of pollution emitted (usually by government issuing additional pollution permits to the market to reduce demand). Economic theory states that when an aggregate amount of emissions is capped the price that arises in a marketplace for an allowance will be equivalent to the price of carbon in a tax scheme that would result in that same level of emission reductions. This is a simplifying case that assumes identical emitters are regulated, revenues are returned in that same manner and frictionless markets for allowance prices.

Many economists favor taxes over cap-and-trade systems as a less intrusive means to align the current price of pollution with its true social cost (Mankiw 2009). They believe that a carbon tax can better allocate resources without the need for strong government intervention. Many economists are also drawn to the fact that tax revenues can be used to reduce taxes that discourage economic growth, such as taxes on labor. They see cap-and-trade programs as inefficient because they promote higher initial emissions from entities if allowances are based on historical emissions rates, they do not generate revenues unless the allowances are auctioned, and they allow for the costs of achieving emissions reductions to fluctuate over time (Mankiw 2009).

Although a carbon tax may be the preferred policy, implementation is often politically unfeasible in the United States due to public aversion to taxes (Porter 2012). In a 2007 Wall Street Journal poll that questioned 2,057 Americans on important strategies for reducing energy consumption from automobile use, only 5 percent of respondents considered a gasoline tax to be important (Bright 2007). Whether the tax is paid directly at the retail level or passed down from wholesalers, consumers will face higher gasoline costs and many are unlikely to support such a policy without fair compensation. However, others have suggested this aversion to taxes is too simplistic and they have numbers to support this claim. For instance, a national poll of Americans in 2015 found that 70% supported a carbon tax (SSRS 2015). Still, there is widespread belief that taxing energy is political suicide and politicians in America are unlikely to consider a carbon tax in the near future. While perceived to be more politically feasible (Harrison 2012a), cap-and-trade programs are also opposed on similar grounds. The U.S. House of Representatives passed legislation in 2009 to establish a federal cap-and-trade program, but it quickly

carbon price will therefore be revenue-neutral, fully recycled back into the Alberta economy." This is a significant departure from how the term has been used in British Columbia and every other jurisdiction that we know of.

⁷ From a managerial perspective, allowances would be bought if their cost is exceeded by the cost of abatement.

died when the Senate did not pass companion legislation because of a lack of bipartisan support (Lizza 2010) with some opponents calling the program a “job killing energy tax” (Kaplan 2009).

2.2.1 Administrative Demands

One inherent advantage of a tax over cap-and-trade is reduced administrative demands. Industrialized countries have existing tax systems that could administer a carbon tax with minimal additional overhead. The additional demands for a government are to document, verify and report carbon content in trade and to enforce penalties for noncompliance. A cap-and-trade program, comparably, is a completely invented market. It requires a new administrative marketplace where allowances are allocated, traded and tracked while the regulatory body provides liquidity and price stability (Revelle 2009).

The decisions to place a tax or cap on upstream or downstream sources of emissions will influence administrative demands. An upstream program applies to the producers and importers of fossil fuels; the point where greenhouse gases (GHGs) are introduced into the economy. Administrative costs in this case are lower because few entities need to be regulated (Sumner et al. 2011). A downstream program applies to all emissions at the point of combustion, which could include automobiles, electric utilities, and entities within the commercial, industrial, and residential sectors. Since this program encompasses the entire economy (assuming the system is without sector-specific exemptions), it presents significant administrative challenges. A downstream program could, alternatively, be limited to large stationary sources, which would reduce the administrative challenges (Revelle 2009).

2.2.2 Coverage

Coverage refers to the emitters included in the pricing scheme, what they pay, and any exemptions. Economists espouse broader coverage to send stronger price signals. Emission reductions will be greater as more emitters within a locale are covered and thus face economic incentives to reduce their GHG footprint. The burden of pollution costs should not be borne by any one group, but shared between all emitters to ensure equitable distribution of abatement. A broadly based scheme within a jurisdiction ensures the reductions come from all economic sectors (Murray 2007) and the most cost-effective means of GHG reduction are utilized. Coverage that extends between jurisdictions reduces competitive advantages between industries that arise from carbon price differentials and mitigates policy leakage across political borders.

2.2.3 Social Equity

Both carbon taxation and cap-and-trade impact consumers by increasing the costs of end use fossil fuel products and inputs throughout the economy. An energy tax can have regressive effects as low-income households already spend a large portion of income on energy. Carbon pricing policies may also affect firms dependent on fossil fuels, resulting in lost jobs. To compensate these individuals, a policy is often designed to allocate some portion of its revenues to reducing the negative impacts that these individuals experience. The revenue can be distributed as a lump sum to each negatively-impacted citizen, or it can be used to fund energy efficiency programs, reduce existing taxes (i.e. income or sales taxes), or provide financial relief for laid-off workers as they transition to new jobs (Revelle 2009).

2.2.4 Economic Impacts

Carbon pricing policies can have adverse impacts on industries. Industries that the tax or cap affects will have to either pay the per-unit price placed on emissions, purchase emissions allowances, or invest in meeting their reduction requirements. Meeting these goals will be more costly for some industries than for others. Furthermore, industries that heavily rely on fossil fuels may find it challenging to pay the higher prices passed on from the fossil fuel industries that are required to comply with the tax or cap. The following sections address certain aspects of both policy approaches that make a policy more or less desirable for an industry.

2.2.4.1 Price Stability

Carbon taxes provide industries with a clear long-term price signal to assess operational expenses and make financial projections (Sumner et al. 2011). The costs incurred by industries and households are less obvious with a cap-and-trade program, since it sets the quantity of emissions and allows the price to be determined in the marketplace. As the demand for carbon emissions changes over time the price of allowances and the cost of reducing emissions will also change (Mankiw 2009). This price instability adds uncertainty to business operation costs.

There are a few different ways that a cap-and-trade program can be designed to address price instability. The first is to provide industries with the option to bank their current unused allowances and use them in the future. This can help manage future abatement costs that are predicted to be higher than current ones. Conversely, industries may be allowed to borrow allowances from the future in situations where the prices technology upgrades today cannot be justified with today's allowance market. Borrowing from future allowances encourages industry to make changes to their operations earlier than they otherwise might. Designing a policy with a multi-year compliance period would also provide industries with more time to find the right combination of technology improvements and allowance prices (Revelle 2009). Price floors and ceilings for allowances provide upper and lower bounds for the cost of abatement, thereby reducing business uncertainty (Stavins 2010). A floor and ceiling may be combined to form a collar, where emitters are guaranteed that allowances will remain within a specified price range (Stavins 2010).

2.2.4.2 Compensating Vulnerable Industries

Industries that are more vulnerable to adverse impacts from a carbon pricing policy include those that are dependent on fossil fuels, that emit carbon as part of an industrial process (e.g. cement), or that compete in tight markets with industries in jurisdictions adjacent to the carbon-pricing scheme. Vulnerable industries can be compensated directly with a portion of the revenues raised by each policy. However, it is more likely that these industries will be exempt from the tax or the cap-and-trade system.

In the case of a tax, vulnerable industries might be allowed to pay a lower price per unit emissions (Sumner et al. 2011). A cap-and-trade program can reduce the costs imposed on industries by giving industries the option to meet their reduction requirements through investing in offset projects that mitigate emissions (Revelle 2009).

2.2.5 Guaranteed Reductions

As noted above, one of the greatest differences between a carbon tax and a cap-and-trade program is that a carbon tax guarantees a certain price on emissions, while a cap-and-trade program guarantees a certain quantity of emissions. With a carbon tax, industries will reduce their emissions until it is cheaper for them to pay the tax than it is to reduce emissions further (Center for Climate and Energy Solutions 2013). In other words, the amount of carbon pollution reduced depends on the costs of pollution abatement for each firm. As a result, a carbon tax does not necessarily guarantee that a region will be able to achieve mass-based or rate-based emissions goals; however, there are a couple of ways to improve the likelihood that these goals will be met. The first is to set the tax at a price that is equal to the external costs associated with producing greenhouse gas emissions – the social cost of carbon. EPA has calculated this, yet there is considerable disagreement about what that price actually is (Mankiw 2009). The second way is to structure the tax so that the price will increase over time, until the goals are met. Although not yet implemented, the most effective way to guarantee reductions with a tax would be to have the price increase automatically when emissions reduction goals are not met (Sumner et al. 2011). To be sure, the rate of the carbon tax will need to increase with time (or the size of the carbon cap will need to decline with time), as the low-hanging fruit are picked and further reductions in emissions require more and more expensive upgrades.

2.3 CARBON PRICING IN PRACTICE

A monumental case in pollution pricing, often dubbed the “Grand Experiment” (Schmalensee & Stavins 2012), was the SO₂ cap-and-trade program to reduce acid rain in the eastern United States. It began in 1995. The program set a cap on aggregate emissions from electricity generation plants and grandfathered in permits to the firms based on their past emission history. The permits granted the entity the allowance to emit a specified amount of SO₂. A marketplace was established where permits could be bought or sold to cover the need to pollute. The process intended for those firms to pay the costs of abatement and sell the accompanying permits, thus gaining a profit when revenues from selling allowances would surpass the cost of abating the equivalent in SO₂. This system incentivizes investment in emission reduction technologies for those firms positioned to do so and at the lowest costs, while allowing those firms who face higher abatement costs to pay for their emissions in the form of permits. Often cited by supporters of market-based approaches to reducing emissions, the SO₂ allowance system has been deemed a success and has influenced environmental policy innovations across the globe (Schmalensee & Stavins 2012).

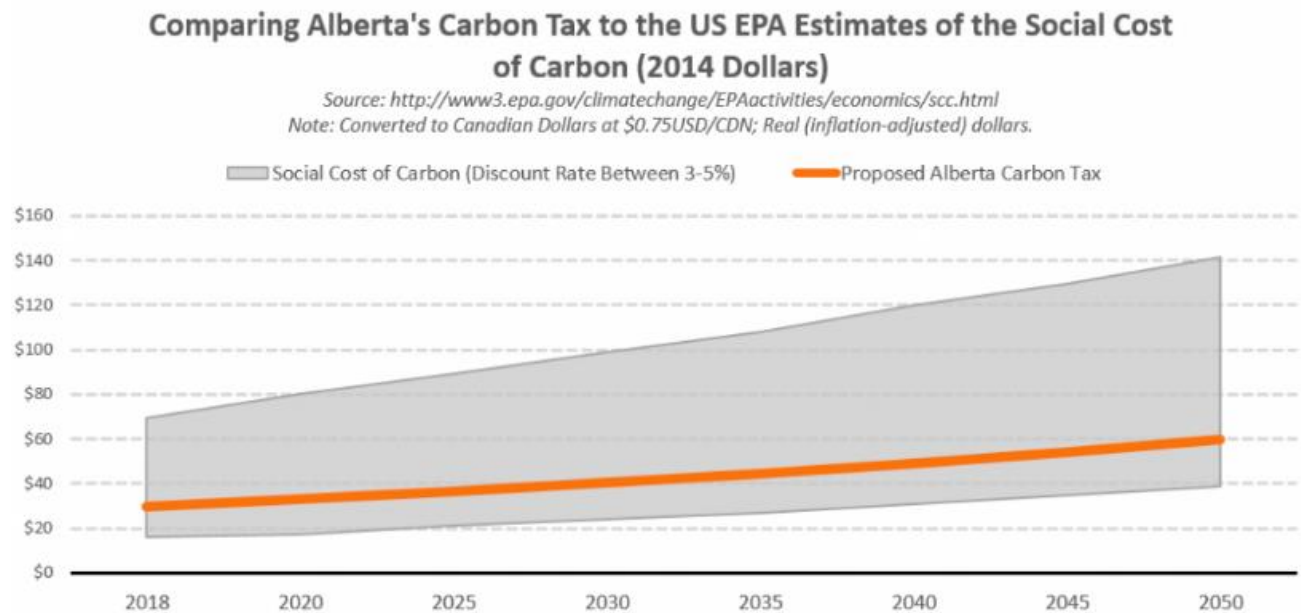
Market-based emission reduction systems of cap-and-trade and carbon taxation are used effectively in jurisdictions around the world. There are currently 38 carbon pricing instruments that have been implemented or are in the implementation process that span 38 national jurisdictions and 23 subnational jurisdictions (World Bank 2015). New systems are applied with increasing frequency: Mexico, France, Chile and Portugal announced carbon taxes in 2014, while the Republic of Korea began a cap and trade system in 2015. However, the most notable jurisdiction to recently join the carbon-pricing club was China, which initiated pilot cap and trade schemes across seven jurisdictions in 2013 and 2014. They collectively cap 1.3 GtCO₂eq comprising the world’s largest carbon pricing system (World Bank 2015: 43).

The Nordic countries were the first to adopt carbon taxes, with Finland leading the way in 1990 and the

Netherlands (1990), Norway (1991), Sweden (1991) and Denmark (1992) beginning similar programs soon after (Sumner et al. 2011). In 2007 Boulder, Colorado and Quebec became the first jurisdictions to begin taxing carbon in North America. Boulder levied a tax on electricity that equates to \$12-13 per ton CO₂ and Quebec issued a tax of \$3 per ton CO_{2eq} on all emissions within the province. Both taxes are revenue-positive, supporting investments in energy efficiency in homes, buildings, and public transportation. British Columbia became the standard-bearer for carbon taxation in North America upon implementing its tax shift in 2008. Its pricing mechanism covers a greater percentage of emissions and taxes them at a higher rate than any jurisdiction in the Western Hemisphere.

Continued carbon pricing developments are underway in North America. Alberta, Canada already has a CO₂ pollution performance regulation that includes a C\$15/ton fine on companies that emit more CO₂ than they are allowed, however this policy is replete with opportunities for companies to avoid paying the fine. Thus, Alberta does not presently have an effective carbon pricing system (Jaccard 2013). They certainly do not have a carbon tax. However, under the new leadership of NDP and Notley, Alberta is set to introduce a carbon tax at the rate of C\$20 per ton of CO_{2eq} on January 1, 2017 (Bakx 2016). The tax shares many similar aspects with BC and is scheduled to rise to C\$30 per ton of CO_{2eq} the following year. Canada’s federal government is currently working with the country’s provincial and territorial governments to establish a nation-wide carbon pricing system to be unveiled in October 2016. Given the divergence in programs from carbon tax in BC and Alberta to cap and trade in Quebec, Ontario and Manitoba, the favored scheme at the national level is unclear (Interview Harrison 2016).

Figure 1. Proposed Cost of Carbon Tax in Alberta, CA



Source: Tombe 2015

2.3.1 Western Climate Initiative (WCI)

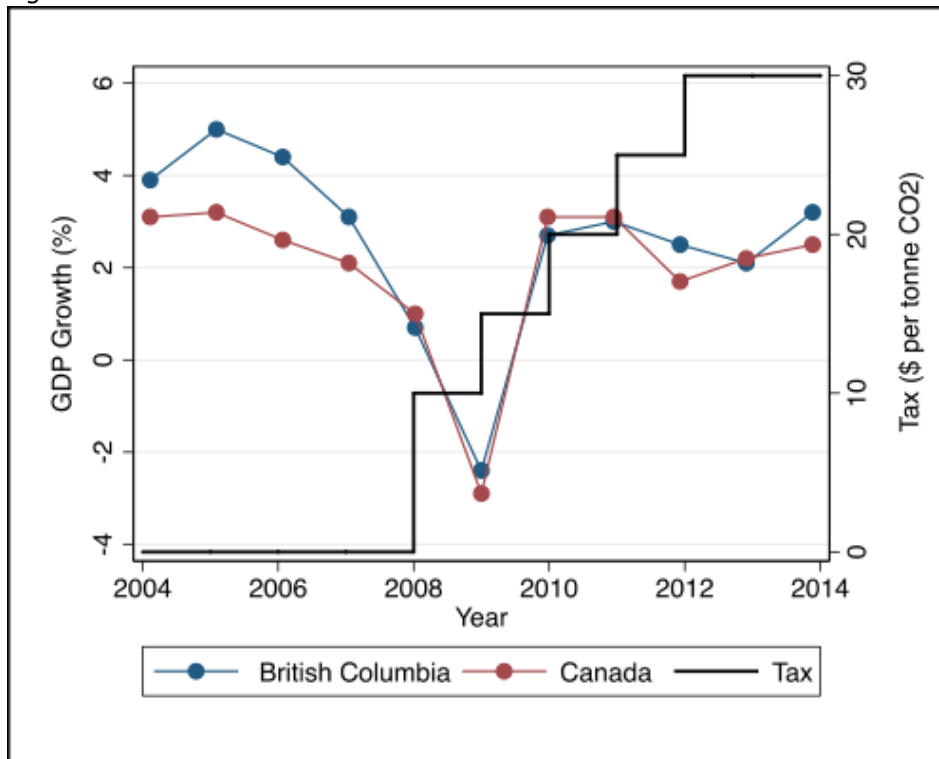
Both BC and Washington joined the Western Climate Initiative (WCI) in 2007, which formed as a coalition of states and provinces to collaboratively address GHG emissions. By July 2008 the Western Climate Initiative expanded to include Arizona, California, Montana, New Mexico, Oregon, Utah and Washington, as well as British Columbia, Manitoba, Ontario and Quebec. This group established a regional emissions target of 15 percent reductions below 2005 levels by 2020 (Western Climate Initiative 2007). A cap-and-trade system was the agreed means for achieving these reductions, with a final design published in July 2010 and set to be implemented in January 2012. Two months prior to the program's planned launch, Washington joined five other states in officially leaving the WCI. The decision to withdraw their participation was influenced by the effects of the 2008 Great Recession on the states' economies, as well as the election of Republican governors in Arizona, New Mexico, and Utah who opposed cap and trade. While British Columbia remained part of the group as an observing member, California and Quebec embarked alone on an emissions trading market that began in 2014. As of the 2015 climate change conference in Paris, Ontario and Manitoba agreed to link cap and trade systems with California and Quebec and are expected to begin trading on the market in 2017. BC's plans and desires to join the three other Canadian provinces and California as acting members of the WCI is ambiguous at best (Interview Harrison 2016).

3. BRITISH COLUMBIA

British Columbia, established in 1871 as the sixth Canadian province, is home to 4.68 million with a total area comprising 350,000 square miles. For context, BC has a population roughly half that of New York City, but an area twice that of Montana. BC accounts for 13% of Canada’s total population of 35.2 million and comprises nine percent of its landmass. BC’s population is congregated in the southwest of the province around the metropolitan venues of Vancouver and Victoria, which are the third and fifteenth largest cities in Canada. Vancouver is the second-largest metropolitan area in the Pacific Northwest and the largest in western Canada. As of 2013, British Columbia had the fifth lowest per capita emissions among the 12 Canadian provinces and territories at 13.7 tons of CO_{2eq} per year, about 34 percent less than Canada’s 20.7 tons per capita (Booth & Boudreault 2016).

Canadian GDP was C\$1.75 trillion during 2014 in chained 2007 dollars, while BC’s C\$222.9 billion comprised 12 percent of the nation’s economic output (BC Statistics 2015). BC has roughly the same GDP as Oregon.⁸ BC’s real GDP growth increased 3.2 percent in 2014, the fourth rate among provinces, and up from 2.1 percent in 2013. National GDP grew 2.5 percent in 2014. BC’s yearly growth rate is graphed below in Figure 2 alongside Canada from 2004 through 2014. The black step function is the carbon tax in C\$ per metric ton CO_{2eq} on the right y-axis.

Figure 2: GDP Growth and Carbon Tax



Source: The British Columbia Economic Accounts. Economic Accounts Data, 1981-2014. Gross Domestic Product, Expenditure Based, by Region (chained (2007) dollars, annual % change).

⁸ Oregon’s GDP in 2009 chained USD was \$203.8 billion, according to FRED Economic Data. That is an implied rate of .89 CAD:USD, after converting chained 2009 USD to chained 2007 USD.

Assessing the economic impact of the carbon tax on the BC economy is difficult to tease out from the many other factors that drive markets. In the wake of global financial shocks and recession there has been nothing normal about industrialized economies for the past seven years. Figure 2 illustrates that BC's economic growth has co-moved positively with the rest of Canada. This does not necessarily prove that the carbon tax had no impact on the economy; growth might have been higher without the tax. Alternatively, one might argue that the tax had a beneficial effect on the economy. At any rate, the data do show that the carbon tax has not devastated the BC economy.

3.1 TAX SHIFT

Implemented on July 1, 2008 as the most comprehensive carbon tax in North America,⁹ British Columbia's revenue-neutral tax originally priced carbon at \$10 CAD per ton of CO₂eq. The price per ton increased C\$5 a year until reaching \$30 in 2012 where it remains today. Table 1 gives a breakdown of the yearly rates. After a review of the tax during the 2013 budget process, the provincial government decided against further rate increases to ensure their economic playing field is consistent with the rest of North America (Ministry of Finance 2013). A future tax review is scheduled for the 2017 budget process. While BC's tax remains North America's most comprehensive, the province is reluctant to implement further increases until other jurisdictions close the carbon-pricing gap (Durning & Bauman 2014, Ministry of Finance 2013).

The tax is based on the GHGs emitted from fossil fuel combustion. Rates per fuel type are determined by converting greenhouse gases to carbon dioxide equivalents (CO₂eq) using 100-year global warming potentials (Murray & Rivers 2015). That rate is then applied pro rata to fuels based on the \$/ton CO₂eq tax, see Table 1. Revenues are collected at the wholesale level alongside the pre-existing motor fuel tax, which minimizes administrative expenses. For instance, when a gasoline wholesaler sells its product to the retailer (gas station) the wholesaler pays the equivalent of the carbon tax to the deputy collector who remits the payments to the Ministry of Finance. In principle, the tax is passed along to the retailer, who pays the wholesaler on purchase, just as the eventual consumer pays a higher price to the retailer. Thus each party that passed on the product is reimbursed whereas the end user effectively pays the tax.¹⁰ (However it is also possible that retailers would not pass along the entire cost of the tax to consumers). Natural gas (43%), diesel (24%) and gasoline (24%) account for the majority of fossil fuel based GHG emissions in BC. Coal and coke combine for five percent of emissions.

Key pillars of the tax include revenue-neutrality, transparency of revenue allocation, gradual and incremental rate increases, protection of low-income earners, the broadest possible base, and integration with other policy measures (Ministry of Finance 2008: 11-12). These principles were enacted to maximize efficacy and minimize welfare loss, which are concerns economists typically associate with carbon taxation (Mankiw 2009). Each of these policy stipulations contributed to the political feasibility of the tax and support among various interest groups (Ministry of Finance 2008: 11).

⁹ Quebec implemented a \$3 per metric tonne tax in 2007 without any scheduled price increases. Boulder, CO also implemented a carbon tax in 2007 at a price of \$12 to 13 USD per metric tonne CO₂eq which applies only to electricity (Sumner et al. 2011).

¹⁰ Phone conversation with the BC Ministry of Finance. April 21, 2016.

Table 1: BC Carbon Tax Rates per Ton CO₂ Equivalent

Yearly Tax Rate ^a	\$/Tonne CO ₂ eq
2008	10
2009	15
2010	20
2011	25
2012 to 2017	30

^aIn effect July 1st of each year.
All prices in \$ CAD, unadjusted for inflation.

3.1.1 Revenue Neutrality

When BC began considering a carbon tax as policy tool the Climate Action Secretariat and Finance Minister reached out to individuals, businesses, environmental groups and economists for input. There was a consensus among those questioned that any additional revenue due to the new tax should be recycled to taxpayers by cutting other taxes (Ministry of Finance: 19). The tax is revenue-neutral, meaning that contemporaneous tax reductions and dividends must equal or exceed the revenues collected. In practice the tax has been revenue negative with more government revenue divvied out than collected (Murray & Rivers 2015, Ministry of Finance 2016: 56). This may be attributed to the bill's incentive-based approach that reduces the Finance Minister's salary by 15 percent if the carbon tax is not revenue neutral or negative (British Columbia 2008). This tax shift is intended to reduce the distortionary nature of a tax code by increasing taxes on societal negative externalities (GHG emissions) rather than societal benefits (household and business income) (Mankiw 2009, Durning & Bauman 1998, Repetto et al. 1992). Revenue neutrality was a measure suggested by the influential National Round Table on the Environment and the Economy (NRTEE) 2007 report, "Canada's Transition to a Low-Emission Future," which espoused the benefits of compensating those who would be policy losers (most adversely impacted) and "proportionally returning revenue based on tax paid" or investing the revenues in technology and innovation (Murray 2007). Even when the tax is designated as revenue-neutral, the process of allocating those revenues in reductions and subsidies is politically motivated. Economists would suggest broad cuts to individual and corporate taxes, as opposed to directed cuts for specific industries or groups that would effectively act as subsidies (Mankiw 2009, Murray 2007). Initially the revenues were redistributed in a broad manner, however, that has changed as the tax has aged.

The province has returned revenues by cutting personnel and business taxes. As implemented in the 2008 Budget, personal income taxes were reduced by an average of five percent for all residents on the first \$70,000 of earnings. In 2008 the small business corporate income tax rate was reduced from 4.5 to 3.5 percent and the general corporate rate fell from 12 to 11 percent in 2008 and down to 10 percent by 2011. Due to the carbon tax, British Columbia has the lowest corporate income tax rate (Government of Alberta 2015) and some of the lowest personal income tax rates in Canada (KPMG 2015). Since the 2013/14 budget, the general corporate income tax reduction has been reduced and replaced with a

targeted corporate tax credit to the motion picture industry under such provisions as the “interactive digital media tax credit” (Murray & Rivers 2015). This exemption runs counter to the non-distortionary business intentions of a revenue-neutral carbon tax, acting as an effective subsidy for companies that claim the digital media tax credit.

3.1.2 Transparency

Public disclosure and transparency are critical to remind constituents that the legislation isn’t a tax grab. The public and media are often suspicious that any alteration of the tax system is a means to bolster government revenues (Jaccard et al. 2004). “Part 2” of the Carbon Tax Act requires the Finance Minister to prepare an annual carbon tax plan that gives the total amount collected and total amount in reductions paid back to taxpayers, as well as an annual report that illustrates a three-year plan forecasting future revenues and the concurrent tax deductions (British Columbia 2008). These measures facilitate transparency and public accountability to combat the immediate opposition to income taxes held by many constituents. Evidence has illustrated that even in cases where the carbon tax is publicized as revenue-neutral, voters don’t believe that will be the case. Opposition to environmental tax reform framed the policy as a tax grab in BC and concurrent elections at the federal level (Harrison 2012b).

3.1.3 Price Stability and Ongoing Adjustments

A carbon tax seeks to provide a constant price signal to businesses and households by setting an explicit price on emissions. To provide a consistent and predictable price signal, the tax rate began low and was incrementally raised at previously specified intervals (see Table 1). BC businesses were reportedly more receptive to a carbon tax than cap and trade due to stable and predictable emission costs. Rather than set an explicit price of emissions, a cap-and-trade system sets the aggregate quantity of GHG to be emitted, usually among qualifying polluters whose emissions exceeded a certain threshold in a specified base year. Allowances to pollute that predetermined level emissions are then allocated among the qualifying firms.¹¹ In this case the market determines the price of allowances, theoretically sold by firms better positioned to abate emissions to firms where the cost of abatement exceeds the cost of purchasing allowances. Hence the market determines the price of allowances after policymakers set the parameters. The volatility of allowance prices increases uncertainty for businesses, whereas the price certainty of a tax is an advantage over cap-and-trade.

Upon implementation, the provincial government planned for rate increases through 2012 and would reassess the efficacy of the tax for further rate changes at that time. Considerations for future increases were based on policy effectiveness, the carbon policies of other governments, and a public review period. A review in the 2012/13 Budget period resulted in a decision to freeze the tax at C\$30 until further review in 2017. BC policymakers reduce economic uncertainty for businesses and households by freezing the tax for a predetermined period. However, the downside of a freeze is the near-term elimination of a policy tool for achieving emission targets in 2020. The decision to freeze the tax was based on the growing pricing differentials between BC and its trading partners, and fears that price increases would have a strong negative impact on economic growth (Ministry of Finance 2013: 63-64).

¹¹ How those permits are allocated depends on the details of the system.

3.1.4 Social Equity

Any broad-based, flat tax will disproportionately impact low-income households. Effects are magnified when the good is inelastic, such that an increase in price is not met with a proportionate decrease in consumption. Energy consumption tends to be inelastic in the short-term¹² and will typically comprise a greater portion of the income for a lower-earner than a higher-earner. A regressive program or policy implies that those with lower incomes will be more adversely affected than others. This could be the case for a carbon tax, depending on the allocation of collected revenues. Those who oppose a carbon tax often cite social equity concerns. Moreover, a price increase of any kind can be attacked on the grounds of its regressive nature on low-income earners. These regressive effects can be combated through reimbursement programs to at-risk households and the redistribution of collected revenues.

Various programs were established to mitigate the adverse effects on low-income households. The Low Income Climate Action Credit, funded with revenues from the tax, began at \$100 per adult and \$30 per child in 2008 and has increased 2 percent per year. Income taxes were reduced 5 percent for the first two tax brackets to reduce household liabilities. Separate from tax reductions, the 2008 Budget included a one-time Climate Action Dividend worth a total of \$440 million that paid \$100 to every BC resident with funds from the 2007/08 surplus. Rural residents comprised another group that expected to be adversely affected by the tax. The Northern and Rural Homeowner Benefit is similar to the Low Income Climate Action Credit, paying rural households a dividend up to \$200 in hopes of offsetting increased living costs.

Revenue neutrality and the dispersion methods mentioned above were designed in part to mitigate adverse effects on vulnerable households. There have been various few studies assessing its effectiveness. A report by private consulting firm Navius Research concluded that if the tax were continued in its current form then the average household would benefit by \$121 annually in 2020 (Melton & Peters 2013). An academic paper published in 2014 found the tax to be “highly progressive” with low-income households comparatively better off than their higher-earning counterparts (Beck et al. 2015). The Canadian Centre for Policy Alternatives used Statistics Canada’s Social Policy Simulation Database and Model to break down the effects by income decile, finding that all income groups were positively impacted outside the top decile of earners (Lee 2011).

3.1.5 Scope and Coverage

The tax covers all fossil fuel combustion throughout the economy among the residential, industrial, public and transportation sectors. Estimates put the tax’s coverage at 70 percent of in-province GHG emissions with the majority being transportation fuels, natural gas and fuels used in industrial processes (Sumner et al. 2011). The tax was developed to include the broadest base possible and is applied to all parties involved in the combustion of fossil fuels within the province (Duff 2008). When implemented, the tax base was devoid any preferential treatment for specific sectors. All industries paid the same rates. Its initial lack of exemptions was a distinguishing factor from similar policies across the globe (Murray & Rivers 2015, Peet & Harrison 2012], and prompted many to describe the policy as an economist’s ideal carbon tax (Murray & Rivers 2015, Jaccard 2012). Yet notable exemptions are fuels

¹² A price elasticity of gasoline was estimated to be -0.9 in Canada in 2001 (Yatchew & No 2001), meaning that when prices increase by 1 percent, consumption falls by 0.9 percent.

exported, inter-jurisdictional transportation, non-fossil fuel emissions, and fugitive emissions of methane from the production and transmission of fossil fuels. The policy is intended to tax emissions that occur in the province. Coal consumption in BC is taxed, but coal exported is not taxed. Alternatively, fuels produced and refined in other jurisdictions would be taxed if they are burned in BC.

However, preferential treatment has been granted in recent years due to fears that certain industries are disadvantaged relative to their out-of-province counterparts. Agriculture was granted an exemption in 2014 under the assumption that BC producers were at a comparative disadvantage to those in Mexico and California (Murray & Rivers 2015). However, a 2015 paper on “The Effect of Carbon Taxes on Agricultural Trade” found that exemptions granted to BC’s agricultural industry are not justified by empirical evidence (Rivers & Schaufele 2015). The cement industry also reports a disadvantage to its out-of-province competitors and has asked for an exemption, although no exemption has been granted.

3.1.6 Link with Other Systems and Measures

BC’s policy response to meeting the targets set in Campbell’s 2007 Throne Speech has been dubbed a “shotgun” approach due to the wide array of policy directives and legislation to curb emissions (Jaccard 2012). A bevy of measures were implemented to stimulate supply and demand for alternative fuels, investments in energy efficiency and conservation. A cap-and-trade program was part of this legislation, envisioned to work in tandem with the tax to cover emissions from non-combustion sources. A sample of the various proposed tools with legislated backing by December 2008 is given below:

- Carbon tax: Revenue-neutral carbon tax based on GHG emission from fossil fuel combustion.
- Cap and trade: Work within the Western Climate Initiative to develop a market for carbon trading permits used by large industrial emitters. Legislation was passed as the Greenhouse Gas Reduction Act which provided the statutory basis for a cap-and-trade system targeted at large emitters. BC passed the Greenhouse Gas Industrial Reporting and Control Act (GGIRCA) in November 2014, which came into effect in January 2016. The GGIRCA sets emission restrictions on the province’s largest polluters, specifically those in energy production,¹³ and did away with the statutes enabling BC to join a cap-and-trade system. BC’s plans and desires to join the three other Canadian provinces and California as acting members in the Western Climate Initiative is ambiguous at best.
- Carbon neutral public sector: By 2010 the public sector will have net-zero emissions. Offsets are purchased from eligible emission reduction programs based in BC and ostensibly the public sector can boast net-zero emissions since 2010. However, a searing report from the Office of the Auditor General of British Columbia in 2013 found the credible offsets weren’t purchased and the regulatory bodies failed to provide sufficient information on the cost and quality of those offsets (Doyle 2013).
- Tailpipe emission standards: Makes vehicle GHG emissions consistent with California standards set in 2004.
- Low-Carbon fuel standard: 10 percent reduction in average carbon intensity of transportation fuels by 2020.
- Subsidize new technologies: \$110 million for hydrogen and fuel cell technology, install solar roofs on 100,000 buildings by 2020.
- Provincial transit plan: \$14 billion investment in public transportation infrastructure.

¹³ GGIRCA sets emissions requirements for LNG export facilities and proposed coal generation plants.

Source: BC Government (2008)

3.2 TAX SHIFT ORIGINS

The genesis and subsequent popular acceptance of the tax has been attributed to a confluence of factors from the priorities of constituents, to the electricity grid, to individual political will and nuances of the political structure (Harrison 2013). While other policies are often more politically feasible than a carbon tax, unique circumstances made this policy tool a reality for BC.

In response to constituents, political opportunity and his personal convictions, Campbell revealed a revamped environmental policy in his 2007 Throne Speech, a traditional address to promote the government agenda. Environmentalists were shocked by the premier's stated commitment to the environment (Struck 2007) where Campbell proposed goals of 33 percent reductions in GHG emissions from 2007 levels by 2020 and 80 percent reductions by 2050. Those goals became law in the Greenhouse Gas Reduction Targets Act in November of 2007. The BC Climate Action Plan of 2008 detailed the carbon tax among a litany of other policy tools that would be implemented to reach the lofty reduction targets.

3.2.1 Premier Becomes Environmental Champion

Gordon Campbell and the Liberal Party were unlikely purveyors of a carbon tax. Sitting right-of-political-center, Campbell was known among environmentalists for cutting the environmental budget, pursuing various natural gas and oil exploration, and pushing increased coal-based generation (Harrison 2013). However, the tax was fueled by the strong personal and political determination of Premier Campbell.

In the early 2000s, two parties dominated BC politics: The right-of-center Liberal Party and the left-of-center New Democratic Party (NDP). Gordon Campbell was elected Premier in 2001 as the Liberal Party captured 77 of 79 seats in the legislature. The 2005 election saw the Liberals and Campbell remain in power albeit with their majority reduced to 49 of the 79 legislative seats. Finishing second and third in that election was the New Democratic and Green parties respectively. Absent a viable challenge from their right, the Liberal Party determined moving further left would capture some of the NDP vote without threat of losing conservative constituents. Tackling environmental issues became central to appealing to liberal voters (Harrison 2013: 12).

While Campbell claims he never had an epiphany regarding the importance of environmental stewardship, he is quick to mention a visit to China and Beijing's Olympic Stadium in 2006 as a turning point for his focus on climate policy (Simpson 2009). During the visit Campbell experienced multiple hazardous air days, defined as those between 301 and 500 on the Air Quality Index, where hazardous air conditions equate to a health emergency.¹⁴ Campbell described his experience with the hazardous air days in Beijing as a "visible manifestation of man's impact on the environment around him" (Hunter 2008).

Events at home also drew attention to climate change. This connection has been noted by others covering the origins of the carbon tax (Harrison 2012). In the greatest insect infestation in the history of North America (Robbins 2008), British Columbia lost 44 million acres of forest since 2000 to the pine

¹⁴ According to the Air Quality Index (AQI) levels of health concern for corresponding index values.

beetle (Rosner 2015). In September of 2005 Campbell initiated a \$100 million federal plan to combat the beetle attacks in his province. Warmer temperatures that make the trees less resistant and milder winters that fail to control the beetle population have exacerbated the infestation. The 2008 BC Budget mentioned the beetle epidemic and water shortages during a summary on the effects of climate change. Agriculture in the Okanagan region and hydroelectric generation in the Columbia-Kootenays were cited as vulnerable industries (Ministry of Finance 2008: 10). A variety of extreme weather events collided with British Columbia in 2006, from the November storm, dubbed “Pineapple Express,” that brought 62 °F temperatures as rain fell 10 to 15 mm (.4 to .6 in) per hour, uninterrupted for 15 hours, to the Hanukkah Eve windstorm which wrought hurricane-force winds that uprooted over 1,000 trees in downtown Vancouver’s Stanley Park. That year Vancouver twice broke its monthly record for most precipitation, the previous wettest month dated back to 1953 (Environment and Climate Change Canada 2013).

3.2.2 Public Concern for the Environment

Increasing public concern for the environment contributed political impetus to address GHG emissions. In 2006, 18 percent of Canadians identified the environment as the “single most important problem” facing the country (EnviroNics 2006). The results of this poll are widely cited as a policy inflection point (Harrison 2012, Harrison 2013, Jaccard 2012), and Canadian politicians took notice. The following year Canadian Prime Minister Stephen Harper announced revised targets from the 2002 Kyoto Protocol of GHG emissions 20 percent below 2006 levels by 2020 and 65 percent reductions by 2050. However, this was merely the latest iteration of voluntary emission goals from a federal government that continually failed to meet its targets (Rivers & Jaccard 2009). Canada’s series of nonbinding climate objectives and their corresponding policies did little to curb emissions. From 1990 to 2010 GHG emissions rose 15 percent (Environment Canada 2015) despite the emissions reduction goals set out by the Canadian government, which are displayed in Table 2. Policies drafted to achieve these targets revolved around information programs and subsidies (Jaccard 2012). As much of the industrialized world has realized, these policies have proven ineffective at encouraging the actions necessary to mitigate GHG emissions (Jaccard et al. 2004, Rivers & Jaccard 2005).

Table 2: Canada's Federal GHG Reduction Commitments

Name	Year	Commitment
World Conference on the Changing Atmosphere	1988	20 percent below 1988 by 2005
G7 summit ^a	1988	Return to 1990 level by 2000
United Nations Framework Convention on Climate Change	1992	Return to 1990 level by 2000
Kyoto Protocol [†]	2002 ^b	6 percent below 1990 levels by 2010
Turning the Corner ^c	2007	20 percent below 2006 levels by 2020, 65 percent by 2050
Copenhagen Accord	2009	17 percent below 2005 levels by 2020

^a14th G7 summit held in Toronto, Ontario.

^bKyoto Protocol was signed in 1997 and ratified in 2002.

^cReport unveiled by Federal Conservative Party in 2008 that revised goals of Kyoto Protocol.

[†]Canada withdrew from the Kyoto Protocol in 2011.

Many BC residents see environmental stewardship and activism as integral to the province's ethos (Jaccard 2012). The first branch of the Sierra Club outside the U.S. was established in BC (Zelko 2004: 220) and Greenpeace was founded in Vancouver, which is also home to one of the globe's leading environmentalists -- David Suzuki. These are points of pride for many citizens (Jaccard et al. 2004). Furthermore, the far left-leaning Green Party can garner 10 percent of the vote for any given election, even without a chance at office in the winner-take-all parliamentary system. The influence of the party forces the others to move further left on many environmental issues. In manifestation of these political leanings, BC's role as a policy innovator regarding environmental issues has been likened to the role of California in the U.S. (Jaccard et al. 2004).

3.3 EFFICACY OF THE TAX

Prior to the public carbon tax review in 2012, University of Ottawa-based national policy think tank and research network Sustainable Prosperity, headed by Stewart Elgie, issued their own report of the policy's impacts (Elgie 2012). The report found that the use of petroleum fuels subject to the tax fell 15.1 percent, and 16.4 percent compared to the rest of Canada. It also found that BC's GDP growth exceeded the rest of the country's GDP growth. The group concluded that the policy initiative has been beneficial to the province but neglected to suggest further measures following the 2012 review. Another Sustainable Prosperity report in the following year corroborated the prior findings and determined that after five years, BC's per capita consumption of petroleum fuels subject to the tax fell 18.8 percent compared to the rest of Canada (see Table 3) (Elgie & McClay 2013). As Figure 3 shows, the biggest reductions in petroleum fuels were in fuel oil and petroleum coke. Figure 4 shows that there has been a downturn in the volume of petroleum fuels sold in British Columbia since the carbon tax was initiated.

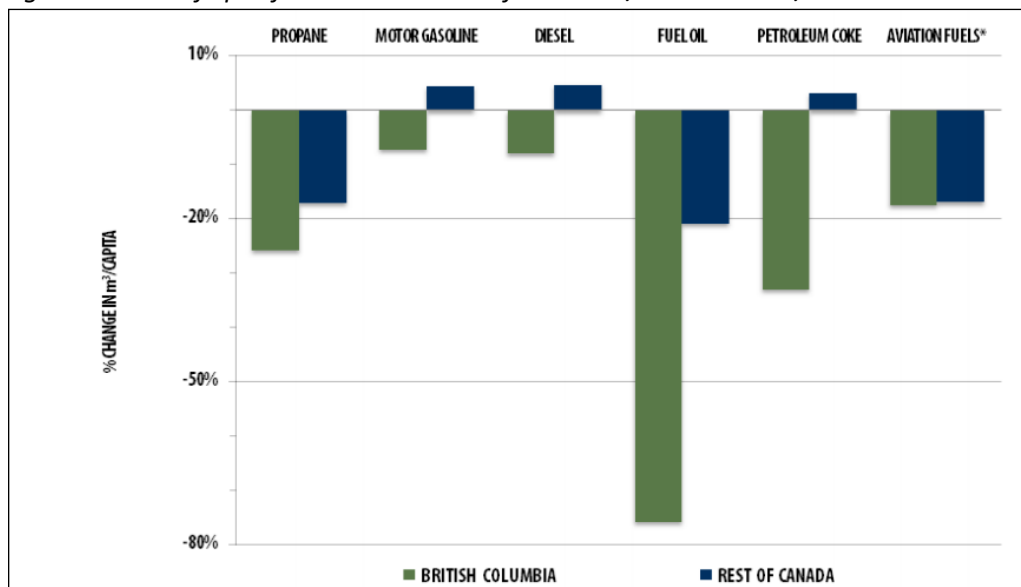
However, discerning the effect of the carbon tax from all other related policies and macroeconomic effects is difficult to do.

Table 3: Per Capita Consumption of Petroleum Fuels Subject to BC Carbon Tax (% change)

	2008/2009	2009/2010	2010/2011	2011/2012	2008-2012 Total
British Columbia	-5.4%	-3.6%	-2.4%	-7.1%	-17.4%
Rest of Canada	-3.4%	-0.7%	3.9%	1.7%	1.5%
Difference	-2.1%	-3.0%	-6.3%	-8.8%	-18.8%

Source: Elgie & McClay 2013

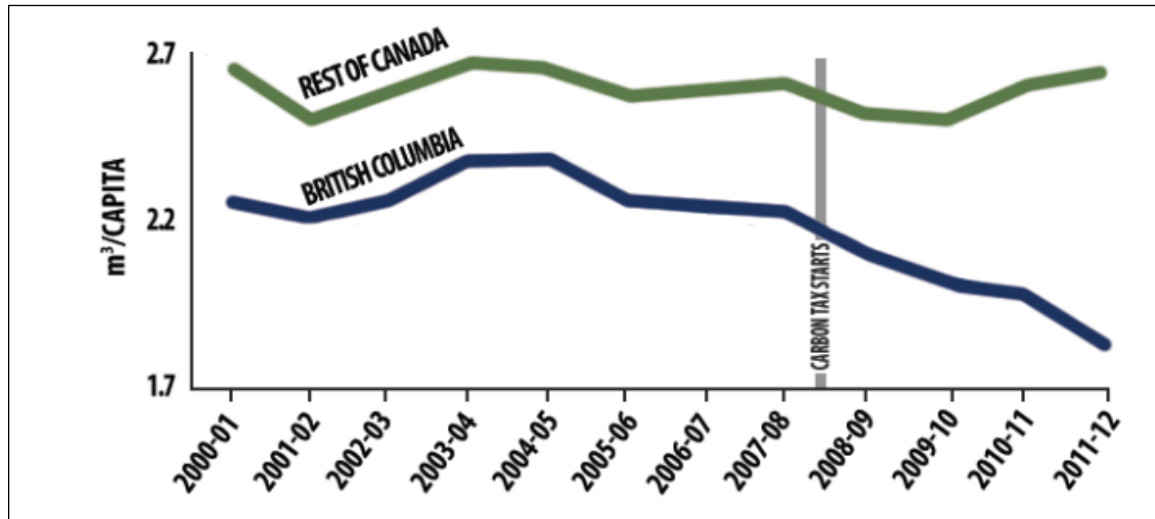
Figure 3. Sales of Specific Petroleum Fuels from 2007/2008 to 2011/2012



*Aviation fuels are mostly exempt from the carbon tax.

Source: Elgie & McClay 2013

Figure 4. Sales of Petroleum Fuels Subject to BC Carbon Tax Between 2000-2012



Source: Elgie & McClay 2013

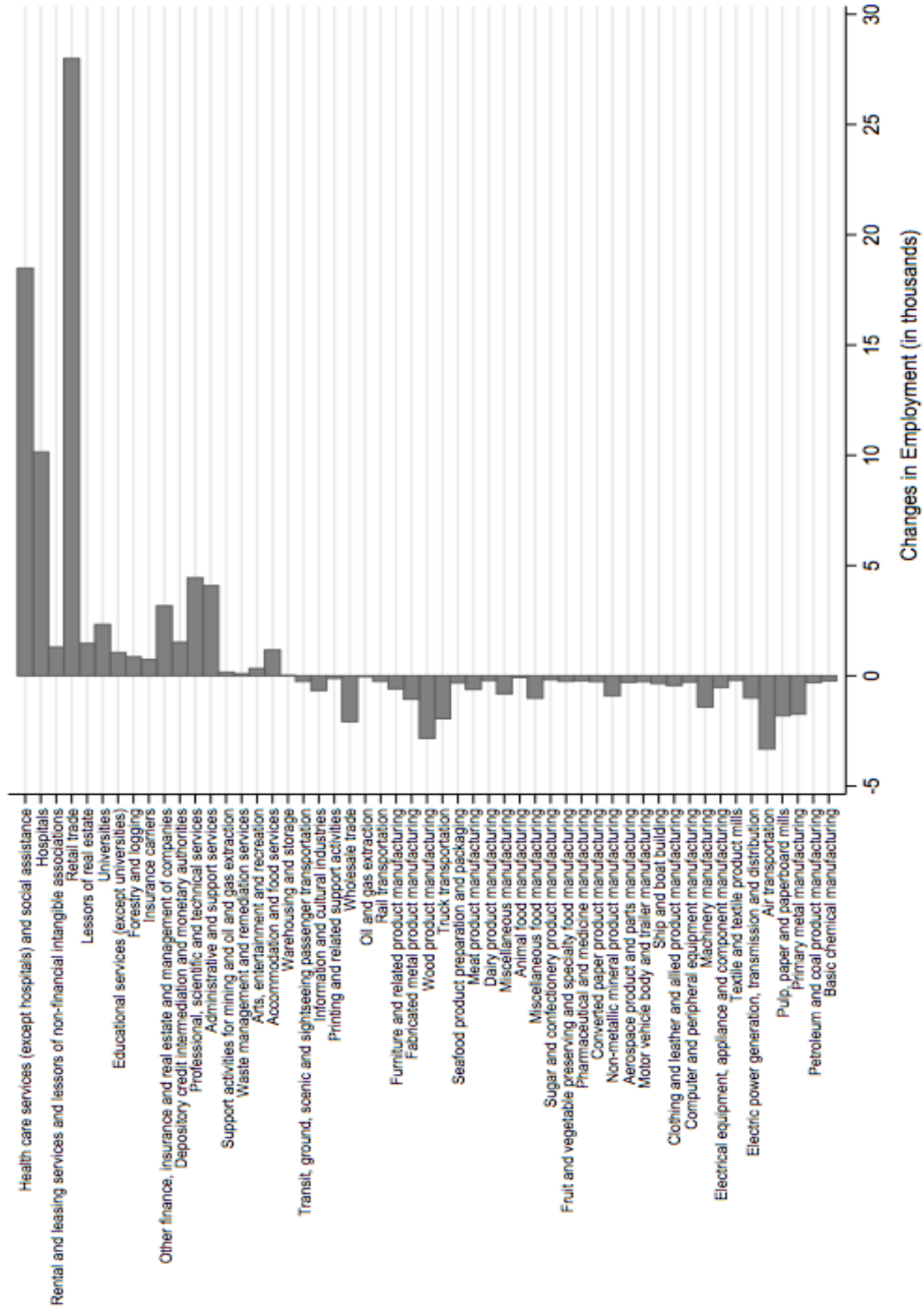
The Carbon Tax Center, a 501c3 nonprofit based in New York, released a policy analysis of the British Columbia carbon tax in 2015 (Komanoff & Gordon 2015). Their findings were generally positive: a 12.9 percent decrease in per capita emissions from 2007 to 2013 compared to the 2000 to 2007 period and unimpeded GDP growth; however, the pro-carbon pricing think tank cited a rise in per capita emissions in 2012 and 2013 and the absence of inflation-adjusted prices as evidence that the tax's increases should be resumed. Murray and Rivers (2015) summarized the known literature on the BC carbon tax, including the methods and results of each study. Each study that they cited used economic modeling to determine the efficacy of the tax.

One of these studies examined the household impacts of the tax. This study analyzed the equity effects of the tax with its revenue-recycling program. The study found that the tax was progressive and would remain progressive even without its revenue-recycling program (Beck et al. 2015). Another study cited by Rivers & Murray used economic modeling to try to estimate the effect of normal price fluctuation on sales of commercial natural gas, and concluded that the carbon tax probably reduced sales by 15% (Gulati & Gholami 2015). The authors also cited a working paper by Yamazaki (2015) that used econometrics to determine employment effects from the tax. These effects are displayed in Figure 5. Yamazaki found that energy-intensive and trade-exposed (EITE) industries experienced job losses as a result of the tax, since these industries are more reliant on fossil fuels. The sector most negatively impacted by the tax was the basic chemical manufacturing sector, which is an EITE industry. This sector experienced a 30% loss in jobs. However, job increases in other industries, such as the health care sector, offset the job losses from EITE industries. When considering the employment effects of the tax across all industries, the overall effect was positive (Yamazaki 2015).

Based on their literature review of these two studies and others, Murray and Rivers came to the conclusion that the tax has reduced emissions and fuel consumption 5-15 percent, has negligible effects on GDP, and has a relatively small effect on income distribution (Murray & Rivers 2015). Despite its apparent successes, there are also some potential flaws of the BC carbon tax. The first of these is a possible leakage effect. No known research has been conducted to determine if reductions in BC's emissions from the carbon tax have caused increases in emissions in other jurisdictions, but it is a possibility. Another potential flaw is the narrowing scope of the tax. When it was first implemented in

2008, the BC carbon tax had a wide scope and allowed no exemptions. The coverage of the tax has narrowed over time as exemptions for the agricultural sector and tax breaks for certain industries, such as the film industry, have been allowed. In addition, the BC carbon tax continues to experience political opposition from various demographic groups, such as low- and middle-income and rural groups. Political support from these groups is important for elections (Murray & Rivers 2015).

Figure 5. Changes in Employment at \$10/t CO₂ eq (Yamazaki 2015)



4. WASHINGTON STATE

Two years after the current U.S.-Canadian boundary was created in 1846, Washington joined Oregon as a United States territory. It was not until 1889 that Washington officially became a state. The economic development that followed Washington's established statehood was primarily fueled by agriculture, fishing, booming industries such as the Boeing Airplane Company, the creation of the Northern Pacific and Great Northern rail lines, and the construction of hydroelectric dams. These dams provided irrigation, flood control, and inexpensive electricity for the state (US50 2016). Washington State continues to benefit from electricity grids that are predominantly reliant on hydroelectric power, which allows the state to have relatively low GHG emissions compared to the rest of the country. Nearly half of Washington's GHG emissions come from the transportation sector. Total GHG emissions in Washington reached 92 million metric tons CO₂eq in 2012, which was the most recent year that emissions data were reported for the state (Washington State Department of Ecology n.d.). When comparing this number to U.S. total emissions of 6,545.1 million metric tons CO₂eq in the same year, Washington's emissions make up 1.41 percent of total U.S. emissions (U.S. EPA 2016). About 17 percent of Washington's emissions come from industries, with the aluminum, cement, oil refining, and pulp and paper industries leading the way (Carbon Emissions Reduction Taskforce 2014).

4.1 GOVERNOR CHRISTINE GREGOIRE'S ADMINISTRATION (2005-2012)

Although Washington's emissions are relatively small compared to the rest of the country, discussion regarding the adoption of a carbon pricing policy to reduce emissions in Washington has taken place within government over the last decade. However, the state has yet to fully commit to any of the plans it has considered. In February 2007 Governor Christine Gregoire signed an agreement for Washington to partner with six U.S. states and four Canadian provinces in a collaboration called the Western Climate Initiative (WCI). This group was formed with the purpose of determining a regional emissions reduction goal and then developing a market-based program to meet this goal (Ontario et al. 2008).

Within six months of the signed agreement, the WCI chose a regional reduction goal of 15 percent below 2005 levels by 2020 (Western Climate Initiative 2007). Washington State Legislature then set state-specific reduction goals through the 2008 Limiting Greenhouse Gas Emissions Act. These goals included lowering Washington's emissions to 1990 levels by 2020 (Washington State Legislature 2008). In June 2008, Governor Gregoire joined the governors of Alaska, British Columbia, Oregon, and California in establishing the Pacific Coast Collaborative. The group meets annually to discuss regional action against climate change and to share best practices in individual jurisdictions (Governments of Alaska, British Columbia, Oregon, Washington, and California 2008).

In July 2010, the members of the WCI published their final design for a regional cap- and-trade program to be implemented in January 2012. Two months before the regional program's planned implementation, Washington joined five other U.S. states in officially leaving the WCI. The decision of the states' governors to withdraw their participation was influenced by the effects of the 2008 recession on the states' economies, as well as the election of Republican governors in Arizona, New Mexico, and Utah who oppose cap and trade (Rabe 2015). The remaining members of the WCI—California, BC, Manitoba, Quebec, and Ontario—announced the formation of the Western Climate Initiative, Inc. in November 2011 as a non-profit program with the purpose of providing support to emissions trading programs in states and provinces.

4.2 GOVERNOR JAY INSLEE'S ADMINISTRATION (2013-PRESENT)

Soon after he was elected, Governor Inslee requested that the Washington State Legislature create a workgroup that would be tasked with recommending programs and policies to ensure the state would reach its emissions goals outlined in the 2008 Limiting Greenhouse Gas Emissions Act (Washington State Legislature 2008). The Legislature accepted Governor Inslee's request and established the Climate Legislative and Executive Workgroup (CLEW) through the Engrossed Second Substitute Senate Bill 5802. CLEW consisted of six members and four alternates, including Governor Inslee, Senator Doug Ericksen, Senator Kevin Ranker, Representative Joe Fitzgibbon, and Representative Shelly Short (Office of Washington Governor Inslee 2014b).

Between May and December 2013, CLEW met eight times and held three public hearings. The workgroup researched Washington's energy consumption and policies, federal policies that affect the state's emissions, and greenhouse gas reduction programs outside of the state (Office of Washington Governor Jay Inslee 2014b). CLEW determined that with its current policies, Washington would not meet the statutory limits set in 2008 without further action on limiting carbon pollution (Office of the Governor 2014). In CLEW's final report submitted to the Legislature in December 2013, Governor Inslee, Senator Ranker, and Representative Fitzgibbon recommended that Washington take immediate action on climate change by adopting five programs. These programs include a market-based program that would put a cap on carbon emissions, measures to reduce the use of coal, an energy-neutral building program, funding for clean energy, and efficiency measures for the transportation sector (Climate Legislative and Executive Workgroup 2014).

In response to CLEW's findings and its recommendation for a carbon pricing system, Governor Inslee established the Carbon Emissions Reduction Taskforce (CERT) under Executive Order 14-04 in April 2014. This group was created with the purpose of advising Governor Inslee on how to design and implement a market-based program that would effectively reduce Washington's carbon emissions below its statutory limits (Office of the Governor 2014). CERT consisted of 21 individuals representing various organizations, including members from Puget Sound Energy, Cascadia Law Group, Washington State Labor Council, Quinault Indian Nation, and Climate Solutions. These members met monthly between April and November 2014. During their meetings, CERT members listened to presentations given by individuals representing California's cap-and-trade program, B.C.'s carbon tax, and the European Union's emission trading system (Office of Washington Governor Jay Inslee 2014a). CERT's final report to Governor Inslee in November 2014 provided extensive discussion of the advantages and disadvantages of both a cap-and-trade and carbon tax system, but the members of CERT did not come to an agreement on which policy would be best suited for Washington (Carbon Emissions Reduction Taskforce 2014).

4.2.1 Carbon Pollution Accountability Act

After reviewing CERT's final report and having his office conduct additional research, Governor Inslee chose to design and implement a cap-and-trade program in Washington. He advised his Senior Advisor of Energy and Carbon Markets, Chris Davis, to draft a policy with assistance from the Attorney General's Office, Department of Ecology, and other legislative bodies (Interview Davis 2015). The policy that Governor Inslee proposed, called the Carbon Pollution Accountability Act (CPAA), would have required all entities that emit more than 25,000 metric tons of greenhouse gases annually to pay for their pollution. This would have included about 130 entities and more than 80% of Washington's emissions

(Brunner & Bernton 2014). The Department of Ecology would have established an annual emissions limit for the included entities that would have gradually decreased over time. Based on these limits, the Department would then create and distribute emission allowances to the included entities through an auction process, which the entities could then trade amongst themselves (Washington State Legislature 2016a).

Governor Inslee proposed the policy in December 2014, which was introduced to the Washington State Legislature through House Bill 1314 and Senate Bill 5283 in January 2015. House Bill 1314 was referred to the House Committee on Environment where it underwent two public hearings. It was passed and then referred to the House Committee on Appropriations, where two more public hearings were conducted. No additional action has been taken on House Bill 1314 since the most recent public hearing in May 2015 (Washington State Legislature 2016a). Senate Bill 5283 was referred to the Energy, Environment & Telecommunications Committee and has remained there since January 2015 (Washington State Legislature 2016b). It came as no shock that the CPAA did not make significant progress in either the House or the Senate. The CPAA was faced with skepticism from republicans, including Senator Doug Ericksen, who expressed concern that the program was a “tax on mobility and a tax on freedom” (Shannon 2014). Republicans held a strong majority in the Senate, and the Democrats in the House outnumbered them by only 48-49 in the 2015-2016 legislature (Washington State Legislature 2016c). The strong presence of the Republican Party in both the House and the Senate made it unlikely that the CPAA would be easily passed.

4.2.2 Washington State Department of Ecology

When it became clear that the CPAA had been stalled in the House Committee on the Environment in early 2015, Governor Inslee used his authority under the Clean Air Act to direct the Department of Ecology (Ecology) to begin writing a rulemaking process for capping carbon pollution. The first draft of this process, which has been termed the Clean Air Rule (Rule), was published in January 2016 for public comment. In this draft Ecology states that it plans to finalize and adopt the Rule by late summer 2016, and then begin the program in 2017 by setting a cap on annual emissions equal to 100,000 metric tons of carbon dioxide. Any company in Washington whose operations generate emissions exceeding this cap will be expected to reduce its emissions. Every three years the cap will be reduced by five percent, or 5,000 metric tons. 40 companies will be initially included, and more will eventually be added as the cap is lowered (Washington State Department of Ecology 2015).

The proposed draft was withdrawn in February 2016 after Ecology reviewed concerns from the public, including those stated in a January 2016 letter written by 14 representatives of energy-intensive and trade-exposed (EITE) companies (Brunner 2016). These representatives expressed disappointment with the proposed rule’s provisions for EITE companies, which the representatives say are unable to pass increased costs onto their consumers because of their participation in highly competitive markets (Entities that are energy-intensive and trade-exposed 2016). Puget Sound Energy, a major utility company in Washington, requested that Ecology exclude the power sector from the Rule because of the work the sector has already done to reduce its environmental impact. Various climate groups expressed concern with the proposed Rule’s ability to effectively reduce emissions, and supported Ecology’s decision to withdraw its proposal (Brunner 2016).

After reviewing public comments, Ecology presented a public webinar on April 27, 2016 to address some

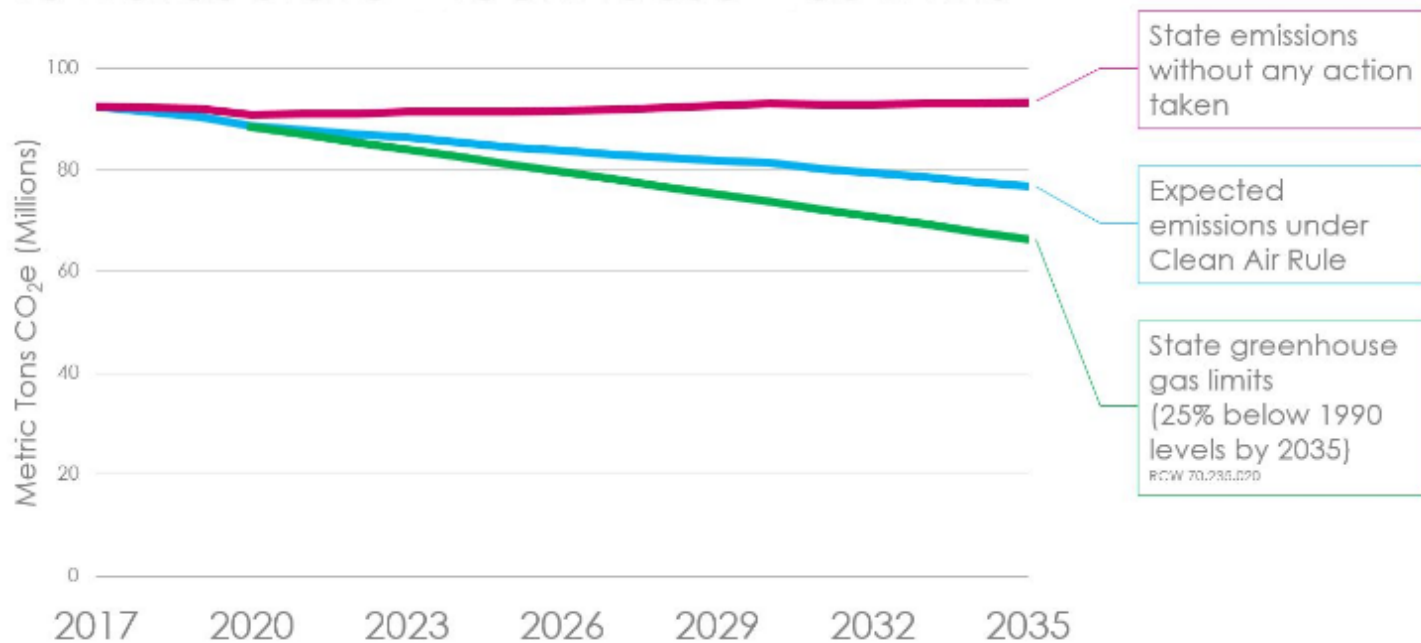
of the key issues brought up by stakeholders. Ecology suggested many important changes to its original draft of the Rule in this webinar. Instead of initially including 40 entities, the Rule will now cover 24 entities when it is first implemented in 2017. EITE companies will not be covered by the program until 2022 to provide these companies with more time to prepare. Ecology noted that a major concern expressed by EITE companies is that they felt the Rule should recognize the efficiency measures these companies have already taken. Many of these companies are considered efficiency leaders in their industries. To address this, Ecology plans to use a site specific, output-based approach to determining the baselines emissions for each regulated entity. This baseline will take into consideration a regulated entity's CO₂ emissions during 2012-2016, its average production, and how these values compare to those of other entities within the same industry across the nation (Washington State Department of Ecology 2016a).

To address concerns about economic growth and the need for a stronger cap, Ecology will establish an emissions reduction reserve to hold specified percentage of ERUs to help current firms grow and new firms locate to Washington State. All regulated entities will contribute a small percentage of ERUs to the reserve. The ERUs in the reserve will also be used to support renewable energy programs and emission reduction projects approved by the Environmental Justice Advisory Committee (Washington State Department of Ecology 2016a). Another important change Ecology made is to primarily exclude the power sector from the Rule, since Washington State's Implementation Plan under the federal Clean Power Plan will cover the compliance for emissions reductions of the entities in this sector. The power sector will only have a compliance obligation under the Rule until the Clean Power Plan is in effect (Washington State Department of Ecology 2016a).

On June 1, 2016, Ecology released a second draft of the proposed Rule that included the changes outlined in the April 2016 webinar. Ecology held an informational webinar on June 23, 2016 that reiterated the details of the Rule and the changes that were made in the second draft. Public comments were accepted on the Rule until July 22, 2016. There were two in-person hearings and two webinar hearings held in July for the public to provide oral comments (Washington State Department of Ecology 2016b).

Although the Rule will help Washington State reduce its greenhouse gas emissions, it is not an effective mechanism on its own for achieving the emissions reduction goals set in the 2008 Limiting Greenhouse Gas Emissions Act. Figure 6 from Ecology's website shows that Washington State will need to implement additional measures to mitigate emissions in order to reach its 2035 goals.

Figure 6. The Effect of the Clean Air Rule on Washington State Emissions



Source: Washington State Department of Ecology 2016c

4.2.3 Carbon Washington

Four years before Jay Inslee became governor of Washington and started his work towards establishing a statewide carbon-pricing program, a grassroots group named Carbon Washington (CarbonWA) began to take form in the minds of young energy enthusiasts. Ph.D. environmental economist Yoram Bauman registered the group’s domain name in 2009. Bauman is the co-author of the 1998 book *Tax Shift* (Durning & Bauman 1998), which is said to have inspired Premier Gordon Campbell’s decision to implement a revenue-neutral carbon tax in BC (Durning 2008). Bauman is passionate about getting a similar policy passed in Washington. In March 2015, CarbonWA filed ballot language with the Secretary of State for their own revenue-neutral carbon tax, called Initiative 732 (I-732), to appear on the November 2016 ballot to be voted on by Washington citizens (Eberhard 2015). CarbonWA collected a total of 362,079 signatures in support of I-732 by their deadline of December 30, 2016, which ensures that the initiative will be on the November 2016 ballot (Carbon Washington 2016d).

One of the goals of I-732 is to attract support from Republicans, since Bauman believes “that the path to climate action is through the Republican Party” (Mankiw 2015). CarbonWA seeks to gain support from Republicans through the revenue-neutrality feature of I-732. The revenue-neutral carbon tax in BC serves as a template for I-732, but CarbonWA has made changes to improve the policy and better adapt it to Washington (Interview Bauman 2015). Some of the differences between I-732 and the BC carbon tax are outlined in Table 4. CarbonWA primarily uses the BC tax as an example of where a revenue-neutral carbon tax has been successful (Interview Bauman 2015).

Table 4: Differences in the Policy Features of the BC Carbon Tax and CarbonWA's I-732

Policy Feature	BC Carbon Tax	I-732
Emissions price at the beginning of the program	In 2008 the price started at \$10 CAD per metric ton of CO ₂ eq	In 2017 the price will start at \$15 per metric ton of CO ₂ eq
Level of increase in emissions price over time	Price increased by \$5 CAD per metric ton per year until it froze at \$30 CAD in 2012	Price will increase to \$25 per metric ton in 2018 and then increase by 3.5% plus inflation each subsequent year until a peak of \$100 in inflation-adjusted dollars is reached
Tax reductions	The tax primarily reduces income taxes, as well as corporate income taxes	The tax will primarily reduce sales taxes, as well as the B&O tax
Compensation for households	BC gave out a Climate Action Dividend of \$100 per household in the first year of the tax	I-732 will fund the Working Families Rebate and reduce the regressiveness of Washington's tax system by reducing the sales tax by 1%
Inclusion of imported power	The tax does not apply to the carbon content of imported power	I-732 will apply to the carbon content of imported power
Inclusion of jet fuel	The tax applies only to jet fuel used for trips that both depart and land inside of BC	I-732 will apply to any jet fuel that is loaded onto planes within Washington state (therefore making Washington responsible for half of the fuel used in each round-trip that takes off or lands in the state)
Inclusion of boat and shipping fuel	The tax applies only to boat and shipping fuel for trips that both depart and arrive in BC	I-732 will apply to any boat and shipping fuel that is loaded onto cargo ships within Washington state
Fossil fuels used in agricultural operations	The tax originally applied to these fossil fuels, but largely exempted these fuels starting in 2013	I-732 allows a 40-year phase in for these fuels, starting at 5% of the normal rate for 2 years, and then 10% of the normal rate for the next 2 years, etc.

Source: Interview Bauman 2016

I-732, as it has been proposed, would tax pollution and use the revenue to cut various taxes in the state and provide other benefits. I-732 would tax fossil fuel consumption as a means of reducing Washington's greenhouse gas emissions. The tax would be imposed on fossil fuel importers and

producers, which covers roughly 85% of Washington emissions. Biofuels, methane produced by cows, and emissions from industrial processes would be exempt. The tax would begin at a price of \$15 per ton of CO in the first year and rise to \$25 per ton in the second year (CarbonWA 2016b). The price would then increase by 3.5% annually plus inflation as a way to maintain revenue-neutrality over time (Interview Bauman 2015).

The \$1.7 billion that I-732 is expected to collect in revenue from its carbon tax would be redirected towards efforts that reduce the impact of the carbon tax on fossil fuel consumers. \$200 million of the revenue would be used to significantly lower the business and occupation (B&O) tax for manufacturers (CarbonWA 2016b). The goal of this measure is to partially offset the financial burden for the energy-intensive manufacturers that would experience the greatest impacts from the tax (CarbonWA 2016a). Another \$200 million would be directed to funding the Working Families Rebate, which is Washington State's version of a boost to the federal Earned Income Tax Credit. This Rebate was created in 2008 but was never funded. Through this rebate, I-732 would provide \$1,500 to 400,000 working families annually to reduce the financial impacts of the tax on low-income households (Carbon Washington 2015a).

The remaining \$1.3 billion in expected revenue for I-732 would be used to decrease the state's sales tax by 1%. This measure is an attempt to make Washington's tax system more progressive, which is currently known for being one of the most regressive in the nation (Carbon Washington 2015a). The sales tax reduction would further reduce the financial burden of the tax on low-income households. Despite the measures that CarbonWA has included to reduce the potential for regressive impacts from its carbon tax, I-732 has been criticized for not being equitable enough (Mangaliman et al. 2015). This has caused some organizations and individuals to look elsewhere for carbon pricing strategies.

4.2.4 Alliance for Jobs and Clean Energy

To address the equity concerns of a Washington carbon pricing policy, a group called the Alliance for Jobs and Clean Energy (Alliance) emerged as a statewide coalition of environmentalists, unions, businesses, and social-justice groups (Climate Solutions 2015). The Alliance was formed in January 2015 by the progressive groups that supported Governor Inslee's CPAA (Mazza 2015), including Climate Solutions, the Washington Environmental Council, the American Lung Association of the Mountain Pacific, One America, SEIU 775, and Washington Conservation Voters. The Alliance, with a steering committee of 30 organizations and support from 150 organizations, wants to see Washington implement policies that reduce greenhouse gas emissions while also growing its economy and investing in communities of color and low-income families (Alliance for Jobs and Clean Energy 2015).

In October 2015, the Alliance published a press release stating its intention to pursue some version of a revenue-positive cap-and-fee policy, with the revenue to be invested in clean energy production and jobs, job transitioning for workers in industries that rely on fossil fuels, adaptation and resiliency strategies in response to climate change impacts, and measures that mitigate the costs of carbon pricing on low-income groups (Skagit County Carbon Policy Forum 2015). The Alliance originally intended to bring this policy to the voters as an initiative on the November 2016 ballot (Alliance for Jobs and Clean Energy 2015). However, in early 2016 the Alliance announced through its website that the initiative would not appear on the November 2016 ballot in order to avoid competing with I-732, because that would likely result in the failure of both initiatives. The coalition plans to continue pursuing its own

initiative with the goal of incorporating the many viewpoints of its supporters (Alliance for Jobs and Clean Energy 2016a). Jill Mangaliman, the executive director of Got Green? and a member of the Alliance's steering committee, explained that the Alliance would rather take its time in developing an equitable initiative than a rushed one that doesn't benefit communities (Brownstone 2016).

The most recent details of the Alliance's policy were released on April 22, 2016 on the group's website (Bernard 2016). The Alliance is working towards promoting a carbon pricing policy that would a cap on overall emissions in the state. The policy would then establish an emissions mitigation fee that specified entities would be expected to pay depending on the amount of greenhouse gas emissions each entity generates. The fee would initially be the equivalent of \$15 per metric ton of CO₂e and would increase over time. This fee would generate revenue to be reinvested in programs that would first and foremost provide benefits to communities, workers, and impacted industries. One of these programs is the Working Families Rebate, which will also be funded by I-732 if the initiative is passed. The Alliance plans to fund the rebate at 20% of the federal Earned Income Tax Credit, and to also provide benefits for any low-income families that are not supported by this rebate. The Alliance's policy will establish an Equitable Transition Fund to provide resources for industry workers that lose their jobs as a result of the clean energy transition. To prevent excessive economic impacts on energy-intensive, trade-exposed (EITE) industries, the Alliance's policy would initially provide rebates to offset these industries' compliance costs. These rebates would decrease slowly over time (Alliance for Jobs and Clean Energy 2016a).

After providing support for communities, workers, and industries that would be impacted by the policy, the remaining revenue would go toward providing benefits for the environment. A Carbon Reduction Investment Fund (CRIF) would be established to hold these funds for various environmental projects, and would be overseen by Washington State University Energy Extension Office. The majority of the remaining funds, about 70%, would be invested in clean energy projects, such as solar and wind installations, low-carbon transportation fuels, energy efficiency, and innovative technologies that do not exist yet. About 20% of the funds for environmental benefits would go towards improving aquatic ecosystem health so that these ecosystems can better mitigate and adapt to climate change impacts. The final 10% of funds would be invested in forest management methods that improve the ability of forests to capture carbon, prevent fires, provide economic benefits, and protect communities (Alliance for Jobs and Clean Energy 2016a). The Alliance has not finalized details regarding the monetary values associated with its expected revenues and funding projects.

The Alliance has yet to decide if their finalized initiative will be moved forward through the legislature or a ballot initiative; however, one of the group's committee members said that the policy will most likely be a ballot initiative, but not in 2016 (Bernard 2016). The next step for the Alliance is to take its policy proposal on a listening tour across Washington to hear feedback from the communities, workers, and industries that will be most impacted by climate change and the transition to clean energy (Alliance for Jobs and Clean Energy 2016a).

4.2.5 Tensions between CarbonWA and the Alliance

When the Alliance initially announced its plan to propose its own initiative for the November 2016 ballot, the plan directly opposed an agreement that CarbonWA and the Alliance had made in an early 2015 joint statement. In the statement, the two groups had agreed to avoid putting competing initiatives on the ballot (Staff 2015). The announcement of the competing initiatives caused division

between the organizations and individuals that support each group. In June 2015, the Alliance released a memo from 23 members of its Steering Committee stating that they would neither support I-732 nor did they believe the initiative would succeed on the ballot. They attached the results from 2,003 phone interviews with registered voters that a Public Opinion Research & Strategy group conducted at the request of the Alliance to gauge public support of I-732. Interview responses indicated that 39% of Washington voters supported I-732 after they read the ballot language (Metz 2015). The Alliance also expressed concerns that a carbon pricing initiative would not be passed in the November 2016 election if there were multiple policies on the ballot in an effort to deter CarbonWA from continuing to gather signatures for I-732 (Pacificshift 2015).

In an attempt to ease the tensions between the groups, the Alliance and CarbonWA met in December 2015 to discuss unifying their efforts, just a few weeks before CarbonWA planned to turn in their 362,079 collected signatures to the Secretary of State (Carbon Washington 2015b). Members of the Alliance—including Climate Solutions, the Washington Environmental Council, and the Nature Conservancy—suggested CarbonWA consider their draft of a carbon fee policy that would use revenues to fund clean energy projects, clean air projects, and forest health restoration efforts. CarbonWA leader Yoram Bauman suggested the idea to the organization’s grassroots base through a blog post sent out via email. In his post he admitted that I-732 had not received as much support from civic groups, the business community, editorial boards, advocacy groups, or conservative voters as CarbonWA had hoped. Even many progressive voters had expressed a preference for a revenue-positive fee over a revenue-neutral tax. Additionally, polls showed that an alternative carbon pricing policy, like the one the Alliance had suggested, was more popular among voters than I-732 (CarbonWA 2015b).

Before the Executive Committee of CarbonWA made their final decision on December 23, 2015 about the new policy, they asked the members of their grassroots group to provide their thoughts on the matter. Members shared their opinions through emails, phone calls, a conference call, and comments on Bauman’s blog post. The idea of supporting a new policy received both support and opposition from CarbonWA supporters. After reviewing feedback from their supporters and receiving more details on the alternative policy, CarbonWA ultimately decided to stick with I-732. They chose not to pursue the alternative policy because, as explained by Bauman on his blog, “there were still lots of unknowns about the proposed new policy and we ran out of time to get to a concrete alternative... plus it’s also fair to say a lot of folks love our policy and our campaign” (Carbon Washington 2015c). CarbonWA turned in the final signatures for I-732 to the Secretary of State’s office in Olympia on December 30, 2015 (Carbon Washington 2016d). The Washington State Legislature reviewed I-732 in early 2016 but did not develop an alternative proposal (Bernard 2016). As of June 2016, it appears that I-732 will be the only carbon pricing initiative on the Washington ballot in November 2016.

5. SITUATING THIS STUDY IN THE POLICY TRANSFER LITERATURE

How do policies existing in one jurisdiction come to be adopted by another jurisdiction? This question has been answered in three different ways by scholars in policy studies. One explanation contends the process is largely happenstance (Cohen, March, and Olsen 1972). Policy makers facing a problem recycle whatever solutions they happen to have had experience with, and through a trial-and-error process they see what works.

A second explanation focuses on the factors of the policy landscape that speed or retard the spread of policies (Walker 1969). Although Walker's original paper on policy diffusion did mention that actors engage in satisficing and bounded rationality, much of the emphasis in the diffusion approach is still put on geography or other mechanistic factors that drive diffusion (Karch 2007). Learning-based diffusion theory (Volden et al. 2008) gives consciousness a stronger role. It also highlights emulation (Mooney 2001) and competition (Berry et al. 1995). However, policy diffusion scholars are not of one mind when it comes to learning-based diffusion. For instance, Mossberger & Wolman (2003) found learning in case studies of policy diffusion was random, unfocused, and even unimportant (Mossberger & Wolman 2003).

The third approach, policy transfer theory, assigns the central role to agency (Wolman 1992, Dolowitz and Marsh 1996). According to Evans (2009) policy transfer can be voluntary or coercive, with the former being "a rational, action-oriented approach to dealing with public policy problems that emerge" (*ibid*: 245). Compulsory policy transfer has largely been studied in the context of the European Union or in the area of trade agreements. Voluntary transfer is also known as lesson drawing (Rose 1991, 1993), which is a process of agents selectively drawing lessons from other jurisdictions' experiences with the policy. Ultimately the lesson drawing process results in rejection or one of four derivatives detailed by Rose (1991) and modified by Dolowitz and Marsh (1996). The policy can be copied or slightly revised (emulated). It can also be synthesized with another policy from a different location, or it may simply serve as inspiration for the design of a completely new policy (see Table 5).

Scholars of policy transfer discriminate among objects of transfer: policy goals, structure and content, policy instruments or administrative techniques, institutions, ideology, ideas, attitudes and concepts, and negative lessons (Dolowitz & Marsh 1996). They also distinguish among types of policy actors and whether the transfer is happening through legislative or regulatory processes. Using these conceptual elements, they weave a story of how policy transfer occurs.

Policy transfer theory has been developing (Benson & Jordan 2012), but there remain contentious aspects. One critique raised is that the focus has been largely at the level of the nation state, and this may limit our ability to recognize and understand policy transfer at other levels of scale (McCann and Ward 2012). One of the contributions of our study is that we examine international policy transfer between two subnational jurisdictions. McCann and Ward (2012) also point out that lesson drawing is often portrayed as an absurdly flat and linear process, and that there is a greater need to recognize the activities that policy actors engage in; actions such as comparison, education, emulation, imitation and persuasion. We are sympathetic to this critique. In our view, learning is a dialogic activity that is highly communicative and social. We contend that there is much to be gained by better integrating recent developments in learning theory (Rodela 2015; Webler et al. 2016) into policy transfer and to recognize policy transfer as an enterprise in social learning. Bandura's idea of social learning (Bandura 2001) is clearly relevant here, but further insights could be gained by employing a cultural approach to learning

(Wertsch 1998. For example, in addition to observing others, policy makers prospectively anticipate how the policy might perform in their locale and they employ a number of sense-making tools in this appraisal process. As noted above, the result need not lead to mere acceptance or rejection; policies can be hybridized or serve as inspiration for the creation of new policy (see Table 5).

Table 5: Clear Paths from Lesson Drawing

1. <i>Copying:</i>	Adoption more or less intact of a program already in effect in another jurisdiction.
2. <i>Emulation:</i>	Adoption, with adjustment for different circumstances of a program already in effect in another jurisdiction.
3. <i>Synthesis:</i> [†]	Combine familiar elements of programs from two or more different places.
4. <i>Inspiration:</i>	Programs elsewhere used as intellectual stimulus for developing a novel program without an analogue elsewhere.

[†]Combines Hybridization and Synthesis as per Dolowitz and Marsh (1996).
Source: Rose (1991) "What is Lesson Drawing?"

Finally, we note that policy transfer literature seems largely focused on a policymaking process that is expert driven. Many studies examine the interactions that take place among policy actors in what is customarily a process of regulatory administration or, to cast a slightly wider net, interest group politics. We point out in this study that policy transfer may also be realized through direct democracy, in this instance, the public initiative. This is a potentially important theoretical difference, because we can reasonably expect that the social learning process in the latter case will take place in the public sphere, necessarily giving a key role to the media.

Voluntary transfer requires dissatisfaction with the status quo (Dolowitz & Marsh 1996) where a gap between policy aspirations and achievements reaches a hypothetical inflection point that begets action and denotes "policy failure" (Rose 1993). This suggests that policy transfer can be understood using the general model of the policy process and is an item we take up in developing our approach.

6. APPROACH

We propose a conceptual model of policy transfer drawing that presumes a voluntary, agent-led, learning-based process. We apply the lesson drawing framework (Rose 1991, 1993) as a process-centered approach (Evans 2009) to understand the potential policy transference of carbon pricing between two international subordinate entities. We examine both the failed legislative process for the Carbon Pollution Accountability Act (CPAA) and the NGO-led public initiative by Carbon Washington.

To understand the potential for carbon policies to be successfully transferred to new locales, we examined the cross-border interaction associated with Washington State considering the adoption of British Columbia's carbon tax (BCCT). We wanted to understand the learning process that policy actors would engage in to determine if and how the BCCT or a variant thereof could work in Washington with the purpose of drawing insights both for the theory of policy transfer and the challenge of achieving carbon policy that will mitigate greenhouse gas emissions and global warming. Our objective was to understand the main avenues by which policy actors in Washington learned about the BCCT, how they engaged in the social learning process, and what evidence proved salient in shaping opinions in policy dialogues in Washington.

We used qualitative research methods to identify the key actors, institutions, documents and reports regarding potential implementation of a carbon pricing policy in Washington and past implementation in BC. Our data sources included interview transcripts with key policy actors as well as documents and reports used to characterize the BCCT in British Columbia and to estimate impacts and effectiveness in Washington State.

6.1 MODEL OF POLICY TRANSFER

In the context of lesson drawing, BC is the innovator (teacher) and Washington is the lesson drawer (learner). We examined how a decentralized pool of decision makers reaches conclusions regarding the appropriate policy to solve a perceived problem. Rather than addressing this retroactively, this case study was conducted as the learning process and policy transference was unfolding. While the final policy outcome is still to come, being embedded in the contemporary dialogue enhanced our visibility of learning dynamics among agents as various policies were proposed, revised, and abandoned. As of summer 2016 Washington was ostensibly well into the lesson drawing process and actively engaged in politics concerning the ballot initiative for November 2016.

Figures 7 and 8 represent our conceptual model of policy transfer. Figure 7 identifies the general structure of the process and identifies the key categories we used to understand the policy transfer process. Along the bottom in Figure 7 is the process of policy transfer from an exporter on the left to a policy importer on the right. At the left is the system state of a policy in place in the export jurisdiction. The exporter may strategically attempt to promote its policy for export, but the framework does not presume an active role on the part of the exporter. At the right is the system state of the policy in the import jurisdiction. The importer may be acting under coercion or voluntarily. The import jurisdiction may be copy, alter, transform, or reject the policy being exported. The intermediary step along the bottom of Figure 7 is the social learning process. It is expanded in Figure 8. The remainder of Figure 7 identifies central components needed to understand the learning process. **Features of the policy** are of obvious importance as these are what the actors discuss and learn about in the transfer process. These are the focus of workshops, studies, and reports that document the policy's performance. **Policy actors**

operate in many locales and participate by contributing insights, perspectives, reports, other documentation, blogs, tweets, presentations, and testimony. (Hereafter, for simplicity’s sake we refer to all of these as “documents and reports,” although we wish to be clear that policy actors do much more than bring information to the process.) The policy actors also interact through **institutions**, which contribute to organizing events and disseminating documents and reports. **Features of the new policy context** include a host of characteristics of the import jurisdiction that presumably shape the performance of the policy in the new locale.

Figure 7: Policy Transfer Model

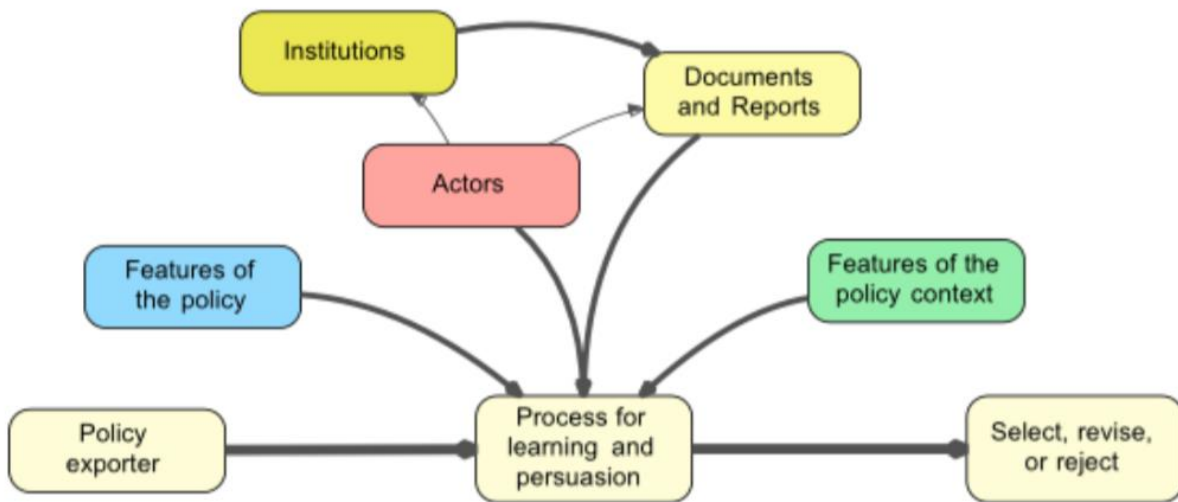
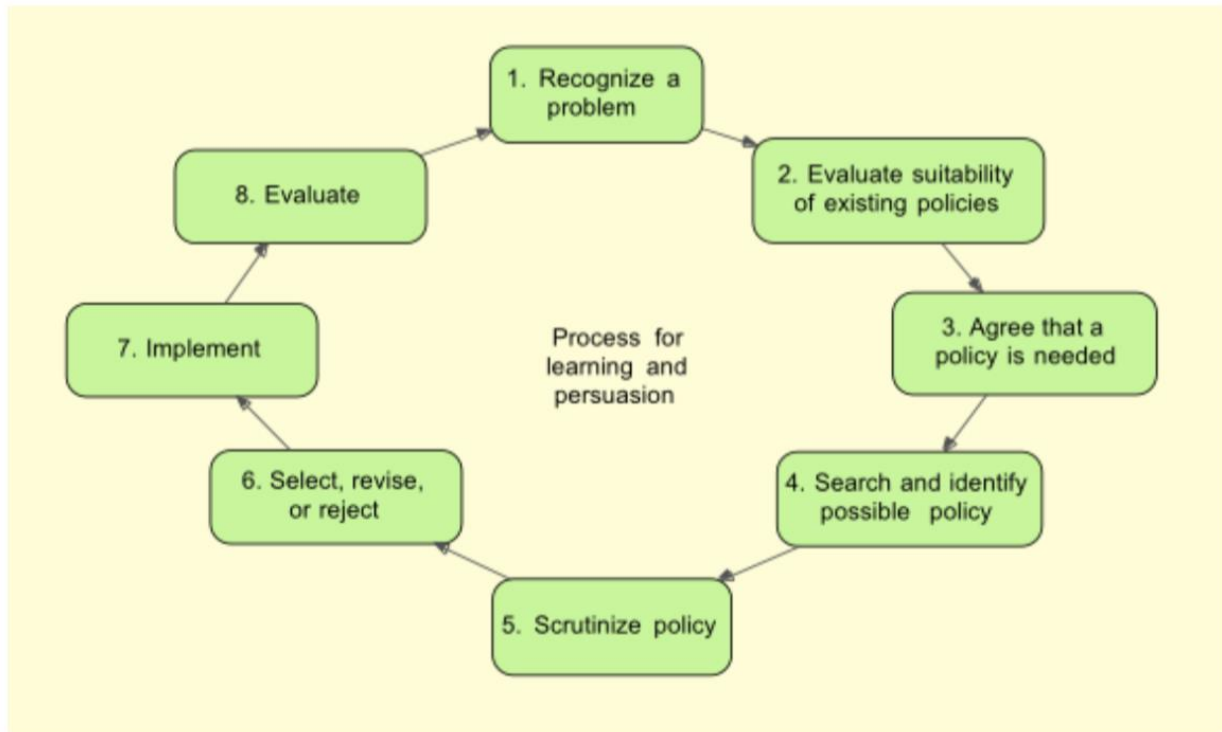


Figure 8 unpacks the box in Figure 7 labeled “Process for learning and persuasion.” We use a version of the generic policy process model, which lays out the steps a rational actor would take to develop a policy solution (Clark 2002).¹⁵ The process begins with a perceived problem or policy failure and progresses through a sequence of logical steps to an end result that is rejection, acceptance, or specified prerequisites for policy support (Batel et al. 2013). The cycle assumes actors are rational and each step involves subjective and inter-subjective evaluation. We recognize that policy actors may not consciously move through this process in a linear methodical manner and we acknowledge the roles that emotion, urgency, and power can and do play in policy making; but we contend that the model is a valuable tool to analyze the policy making process. (As noted in the previous section, we are considering compulsion and coercion to be outside the realm of consideration for this project, due to the specifics of our case study.)

Our focus is on lesson drawing, which occurs in Step 5. At this point, policy actors have already recognized the need for a policy and identified a possible candidate policy for import. It is this lesson drawing step that we seek to unpack in this research. Potential outcomes are rejection or any of the other outcomes listed in Table 5. If selected or altered, the new policy is implemented, results are evaluated, and if they are later deemed insufficient, the process begins anew.

¹⁵ Our analysis does not focus on the legislative process, but on the dialogue that happens among key policy actors.

Figure 8: Policy Process Model



Once the need for a new policy is identified, actors scrutinize candidate policy options for their applicability and acceptability in the new locale. This is the lesson drawing process. The elements of broader landscape that participate in lesson drawing are illustrated in Figure 7. Part of our research was to unpack the items in the boxes shown in Figure 7. Those results are presented in the following section.

Conclusions on policy acceptability are developed through a process of formal and informal dialogues whose medium comprises an assortment of blogs and editorials, conversations and interviews, voter surveys, expert studies and reports, and actors and institutions. Agents are influenced by policy proselytizing from the exporting entity or other policy advocates as they make assumptions regarding policy effectiveness, acceptance, and impacts.

We accept that each step in the process is subjective and actors do not necessarily come to conclusions using a purely rational or linear decision path. However, we do contend that each discrete step in Figure 8 must be undertaken at some point in a formal or informal process of evaluating the policies of other jurisdictions for use in the current locale. These steps may be taken systematically or unconsciously in any order over any time horizon for any actor seeking to elucidate the suitability of existing policies to remedy their problems.

7. RESEARCH METHODS AND RESULTS:

Following in the style of inductive qualitative research, our inquiry began with a broad question: ***How did the BCCT experience influence carbon pricing policy dialogue in Washington State?*** We gathered data from interviews with leading policy actors and texts gathered from media sources, academic studies, governmental bodies, websites, blogs, and public events. We explored these data sources by conducting textual analysis, which we carried out by doing open coding. To perform open coding, we used the constant comparison method (Glaser and Strauss 1967). This produces a set of linked concepts and categories that allow us to ask and answer more focused questions. As a case study we are, of course, unable to generalize from the confines of our case to another site, however we can and do generalize to theory (Yin 1984). In our inquiry we were guided by notions that appeared during the open coding and by theoretical questions and categories contained in the policy transfer literature.

7.1 EVIDENCE OF LESSON DRAWING FROM THE BCCT IN WASHINGTON

We found strong evidence of lesson drawing from the BCCT experience by CarbonWA. CarbonWA keeps itself thoroughly informed about the BCCT. It changed its proposed initiative in response to lessons learned in BC. For instance, BC regretted not indexing their tax to inflation and CarbonWA adopted this change in its policy proposal. CarbonWA continued to justify their initiative partially on the basis of the BCCT success.

We found evidence of limited lesson drawing by two ad hoc legislative groups in Washington. In December 2013 of his first year in office, Governor Inslee established the Climate Legislation Executive Workgroup (CLEW) to examine policy options that would achieve the GHG emissions limits established in state law. CLEW commissioned a report that considered 22 carbon policies in the PNW region. One of these was the BCCT. The justification for including it was that it has five years of implementation history behind it and because BC and WA were similar in that transportation made up a large part of their GHG emissions (CLEW 2013). The subsequent report (Leidos 2013) included a considerably detailed analysis of what the BCCT could mean were it implemented in Washington State (also see Mori 2014). They noted the relative ease of lesson drawing in this case was due to numerous factors:

British Columbia and Washington are geographically contiguous and share many socioeconomic characteristics, including fuel mix of electricity generation, land use patterns, economic structure, and dependence on international trade. These similarities enable a relevant comparison of forecasted and actual effects of the British Columbia carbon tax, to forecasted effects in Washington (Leidos 2013: 49).

Results of the analysis by Mori were not encouraging. He estimated that, for Washington to meet its 2035 GHG targets (which is a reduction of 25% from 1990 levels), the carbon tax would have to be \$240/ton (Mori 2012). At this value, Washington's carbon tax would be the highest in the world, far above second place Sweden (at \$168/ton) or third place Switzerland (at \$68/ton). Mori also concluded that Washington could not meet its GHG targets by using present BCCT pricing. These findings made a strong case for drawing the lesson that carbon tax would not work in Washington and pursuing cap and trade might make more sense. Still, the findings from CLEW were mixed, with democrats arguing for carbon pricing and republicans against any system for carbon pricing at all.

Governor Inslee followed up on CLEW with the Carbon Emissions Reduction Taskforce (CERT), a panel of leaders from business, labor, health, and other interest groups. CERT learned about several carbon policies including the European Emissions Trading System and the BCCT. The appearance of Tim Lesiuk, the BC Climate Action Secretariat Acting Head, to Olympia for a CERT meeting in June 2014 was the most direct exchange that happened between BC and Washington on the carbon tax. CERT did not recommend a specific policy, but did vaguely recommend “drawing on lessons learned from other jurisdictions.” After receiving the CERT report, Governor Inslee announced that his administration would move forward with carbon cap and trade legislation.

In summary, there was limited lesson drawing by the political actors during the 2013-2015 period when the Governor was formulating his strategy for how to move ahead with policies to achieve Washington’s greenhouse gas emissions targets. It is impossible to know to what degree the Governor was fixed on cap and trade during the CLEW and CERT processes. The closest examination of the BCCT seems to have been done by the subcontractor, Leidos, which CLEW commissioned to prepare a report. The most direct exchange came when the CERT invited Tim Lesiuk to come and present about the BCCT.

Even more important, given the public nature of this issue in Washington, we also found little evidence of lesson drawing from the BCCT in the popular media (press, blogs, other key policy documents). Indeed, we conclude there is a great deal of unfulfilled potential for Washington to draw lessons from British Columbia’s experience with its carbon tax. The local Washington media rarely mentioned the BCCT except in passing as a carbon tax. The BCCT appeared in two national media through the spring of 2016. A prominent piece written in *The Christian Science Monitor* in the fall of 2015 made scant mention of the BCCT. It merely suggested Yoram Bauman may have been the impetus for BC adopting the tax. Ken Conca’s piece in *Forbes* merely noted BC had a carbon tax. Given the amount of data and reports available from BC about the performance of the tax, it is striking that so little mention is made of the evidence.

There is a great deal of unfulfilled potential for Washington to draw lessons from British Columbia’s experience with its carbon tax

7.2 BCCT AS EXEMPLAR OF A SUCCESSFUL AND IMPLEMENTABLE CARBON PRICING POLICY

The BCCT was not adopted as the model for the Washington state legislature. Despite this, the success of the BCCT clearly has influenced policy dialogues in Washington State about carbon pricing and this is a kind of lesson drawing. The BCCT was held up as an example that a carbon pricing system that could be implemented. ***Indeed, merely exemplifying that a carbon pricing system can be implemented is the most common way that BCCT appeared in the Washington State policy dialogues.***

It is widely believed—in British Columbia, Washington, and beyond the region—that the BCCT has *not failed*. Had the policy abjectly failed it is very unlikely Carbon Washington would ever consider proposing a carbon tax. In fact, no credible story emerged in BC or Washington of BCCT as a policy failure. Presumably, failure would have been marked by increased carbon emissions, economic decline, or failure of particularly vulnerable businesses. While many companies saw a rise in costs associated with the tax, most were compensated by cuts to corporate income tax. One of the major outliers is,

apparently, the cement industry. Cement manufacturers noted that foreign firms increased their penetration of the BC cement market during the time the tax has been in effect from 5% before the tax to 40% in 2014. They claims this was due to competitive disadvantage of the tax (Cement Manufacturers of Canada 2015).¹⁶ Modification of the tax to account for the embodied carbon of imported cement is one possible response that has been discussed in British Columbia.

To the contrary, there is a strong narrative based around the idea of BCCT as a success, although some specific elements of this story are contested (Weiting 2015). The story of success was most acutely made in a report by Clean Energy Canada, which drew on interviews with top carbon tax policy makers in BC (Demerse 2015). This vignette from the report summarizes the findings:

“A revenue neutral carbon tax is a triple win. The first win is the economy, because it actually rationalizes the tax system for the economy. Second, it creates a whole set of economic opportunities for small and large businesses. And third, it is a political win. I didn’t think we would have won in 2009 if we didn’t have it in place.” – Interviewee

The BCCT is seen as a success for reasons having to do with (a) the policy and (b) the unique context of BC.

Re (a): The policy was designed based on advice from economists who have long argued the advantages of a revenue-neutral carbon tax. Several features of the policy proved instrumental. First, the tax covered emissions from all carbon-based fuels; there were no exemptions. Second, the tax began at a very low rate (\$5/ton) and gradually ramped up until it reached \$30/ton, at which point the increases stopped so that a detailed assessment could be made. Third, the schedule did not deviate, therefore the increases were predictable. This reportedly helped industry to plan for the tax increases. Fourth, policy makers avoided caving into requests for special exemptions and loopholes. Instead, it dealt with problem cases by redistributing revenue back to specific parties (such as rural households). This is important because the tax continues to act as a disincentive to consume fossil fuels, even if the next economic effect on a user is zero. Fifth, the tax was streamlined to fall only upon a small number of fuel wholesalers and to piggyback on an existing tax, which minimized administrative costs.

Re (b): Several specific features of British Columbia led to the tax’s success. First, electricity in British Columbia is nearly all generated by water. A small amount of biomass and natural gas complements the hydropower. Thus, the impact on people’s monthly electricity bills was negligible. Second, British Columbians at the time had grown increasingly concerned about climate change. A prominent survey found that over 20% of residents felt the environment was the most important policy issue facing the province. Third, BC’s politics predisposed action. BC’s politics at present are largely a race between the Liberals (center) and the New Democrats (left). The Liberals saw an opportunity to capture votes from

¹⁶ Note that the tax did not cover non-combustion emissions of carbon. These account for about half of the carbon emissions from cement manufacturing.

the New Democrats by pursuing the tax, knowing that business and the right would continue to support the Liberal party.

7.3 FACTORS SHAPING POLICY TRANSFER

Applying the open-coding methodology to our data sources allowed us to identify several the landscape factors that appear to influence the transfer of policy. (We also identified factors associated with individuals and factors associated with policy itself. These are addressed below.)

Each of the following items was found in at least one of the texts that we examined and implicated with the question of the transfer of the BCCT to Washington.

Factors of the policy landscape include:

- legal and political structures;
- existing policies;
- political ideology of party in power;
- perceived political feasibility;
- administrative capacity;
- opinions of the public and stakeholder groups (including dissatisfaction for the status quo);
- existence of policy champions;
- social justice conditions;
- economic consequences;
- the profile of carbon emissions;
- the composition of emitters;
- the mobility of carbon emitters;
- the vulnerability of emitters to losing market share in the local economy; and
- public concern about climate change.

We consider landscape factors to be variables of the political-economic environment that help to explain the policy outcome for a particular agent or agency. Each agent or agency in the locale encounters these landscape factors, although their personal interpretation of each factor's meaning and importance is shaped by ideology and other understandings (for example: assessment of administrative capacity may be based on personal experience if one works inside a government agency). This, in part, explains how rational actors faced with the same problem arrived at different policy solutions.

In addition to these landscape factors, there are factors associated with policy actors. These include:

- political ideology;
- personal vulnerability to the policy;
- concern for climate change; and
- preconceived assumptions about the carbon tax.

These existing factors comprise the landscape in which the learning process occurs. There are common factors among all jurisdictions, yet their nuances differ by locale. Policy transfer scholars normally expect similar landscape factors between jurisdictions will facilitate policy transfer between the two.

Rather than address these one-by-one, we have pulled out a few key themes that link several factors together.

7.3.1 Policy outcomes and goals

Carbon tax dialogues in BC were concerned with the impact the policy would have on GHG emissions. In other words, would the tax actually reduce BC's GHG emissions? This is not surprising, given the strong public concern for mitigating the driving forces of climate change.

In Washington we found two major themes. First, as in BC, we found that, in the discussions that happened as part of the legislative process led by the Governor, there was a strong focus on achieving the GHG emissions reductions targets in place in Washington state law. Clearly this was because the Governor instructed the parties in CLEW and CERT to focus on finding a policy that would enable Washington to meet its GHG emissions targets. As we noted above, the report by Mori demonstrated that a BC style carbon tax would not succeed in Washington.

Second, we found that, when the dialogue shifted from the legislature to the public ballot initiative, participants emphasized economic impacts such as social equity, the state's economy, and business competitiveness. In fact, in Washington, these themes were much more common and evident than concern about achieving GHG targets.

It is possible that the path to policy implementation shapes the policy dialogue. The legislative process in BC and Washington was guided by an obligation to meet targets the legislatures had set. A public initiative draws voters' attention to the immediate impacts they will face, not abstract targets decades into the future. Public initiative also engages stakeholders who may not even endorse the GHG targets or believe in climate change, although we have no data about the climate beliefs of those participating in the dialogue in Washington.

7.3.2 Equity concerns for a carbon tax in Washington

In the early days when BC was considering the carbon tax, the New Democratic Party opposed it on the grounds that it would inequitably affect disadvantaged populations. As we noted above, this gave the centrist Liberal Party the opportunity to capture votes on the left from the New Democrats. Inequities were addressed by new spending, tax credits, and by cash rebates.

After Governor Inslee opted to pursue cap and trade and the carbon tax policy discussion in Washington moved to center around the public initiative by CarbonWA, a substantive argument formed between CarbonWA and the Alliance for Jobs and Clean Energy over the distributional justice considerations of the tax. This discussion in Washington has not drawn lessons from the earlier discussion between the New Democrats and the Liberals in BC.

The debate between CarbonWA and the Alliance was almost exclusively focused on the following issues: social justice; communities of color; and the regressive nature of carbon pricing. Concerns over whether GHG emission reductions would be met became a secondary or tertiary argument. Furthermore, news stories, blogs, and media outlets played a relatively more important role in the dialogues between CarbonWA and the Alliance than with the Washington state legislature and the BC provincial

government, where the dialogue referenced governmental reports and expert opinion.

The argument between the Alliance and CarbonWA, both groups on the left side of the political spectrum, is arguably the most salient threat to passage of the ballot measure.

7.3.3 The feasibility of a carbon tax passing in Washington

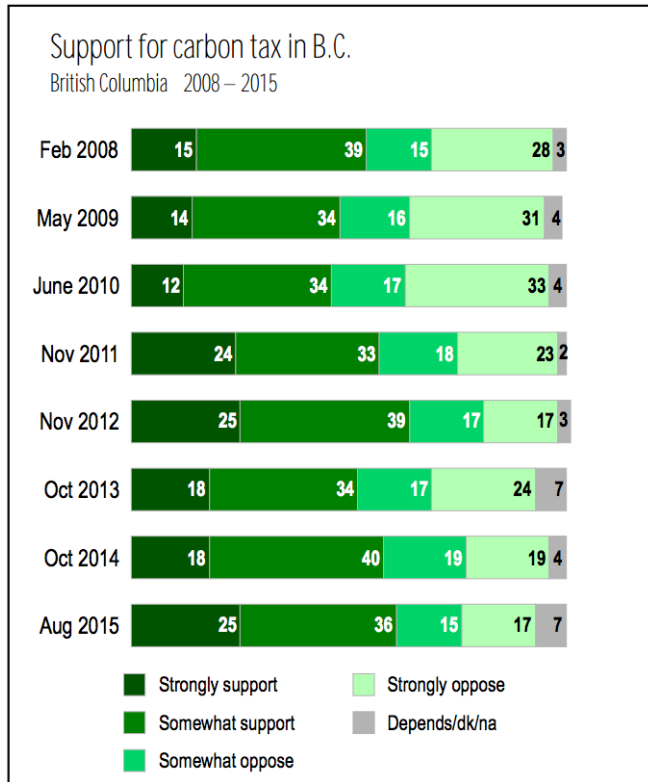
As we noted above, there was strong concern for climate change among the British Columbian electorate early on and 54% supported the carbon tax when it was implemented in 2008 (see Figure 9). In 2008, 66% of the BC public believed climate change was occurring and caused by human activities (EnviroNics Institute 2014). Passage of the tax was not heavily contested.

The situation today in Washington is less favorable to a tax. According to the Yale University Project on Climate Change Communication, as of 2014, only 51% of adults in Washington believe that climate change is human-induced.¹⁷ Yet surprisingly, 78% voice support for regulating CO₂, but only 44% support a carbon tax. Washington is not unusual in its level of support for a carbon tax. Nearly all states have levels of support for a carbon tax in the 40's, with only New York (52%) and Hawaii (51%) breaking the 50% level. In summary, public opinion in Washington appears to be less favorable to a tax than BC enjoyed in 2008.

Moreover, the Washington state legislature is split with republicans holding a razor thin majority in the Senate and the democrats holding a small majority in the House. Republican opposition to any carbon pricing or regulatory policy was made clear in the CLEW.

¹⁷ <https://environment.yale.edu/poe/v2014/>

Figure 9: Support for carbon tax in BC (EnviroNics Institute 2014).



Discussions in the media about the CarbonWA ballot measure have focused on public acceptance of the proposed policy, not the details of the tax itself. Details include where it is collected, who receives rebates, when increases are scheduled, etc. While the well-known meteorologist, Cliff Mass, has endorsed the CarbonWA measure, the public dialogue has not centered around the problem of climate change. Instead, the focus has been on whether or not the electorate will accept any new tax. This is a significant difference from the discussions that preceded BC’s acceptance of a tax.

7.3.4 Factors discouraging policy transfer

Factors that have discouraged policy transfer from BC to Washington include:

- Misunderstandings or incomplete understandings of British Columbia politics, culture, and government
- Misunderstandings or incomplete understandings of the BCCT
- Ideological differences between BC and Washington
- Competition among emerging policy actors in the different states

We found various barriers to policy transfer. Although Washington and BC have close relations at many levels, there remains a great deal of misunderstandings or incomplete comprehension of British Columbian politics, culture, and government. We observed that many people engaged in discussing the BCCT had little understanding of the parliamentary system of government and the identity of the provincial political parties. For instance, the existence of a “Climate Action Secretariat” is unfamiliar to

many of the engaged policy actors in Washington. These gaps in understanding likely made it difficult to Americans to envision how the carbon tax came into being in BC and how it operates today.

Second, incomplete understanding of the BCCT was a factor that discouraged policy transfer. For instance, there is scant mention made in Washington about the fact that the BC Finance Minister's salary is contingent upon making the carbon tax revenue neutral. This is a feature of the policy that Americans would likely find unusual and see as infeasible, yet it is a policy element that Washington might have considered importing. There was also little evidence that Americans understood even the broad points about how the revenue from the BCCT was redistributed.

Third, ideological differences between BC and Washington presented a challenge to policy transfer simply because arguments that worked in BC would not necessarily be effective in Washington. The government in BC is more liberal than Washington and British Columbians generally place more priority on environmental issues. The BC government also enjoys a greater concentration of power due to Canada's parliamentary winner-take-all system. Thus a policy will take a different route into law in BC than Washington. In the case of carbon pricing, Washington's more decentralized government structure, and its recently polarized structure (Democratic small majority in the house and Republican majority in the senate), prevented environmentally-focused Governor Jay Inslee from realizing any substantive policy on carbon pricing (as of July 2016).

Fourth, when Washington Governor Jay Inslee opened discussion on carbon policy, he created an opportunity space for policy actors to improve their power or resources. But probably no one could have predicted that two new policy actors (CarbonWA and the Alliance) would emerge in this space.

CarbonWA has also experienced difficulty in gaining support for I-732. Although the organization successfully collected the necessary signatures to put a revenue-neutral carbon tax on the November 2016 ballot, polling of Washington citizens has revealed that less than half of the interviewed citizens support I-732 after being exposed to pro and con messaging about the tax. CarbonWA admitted that these numbers will be very challenging to overcome with the resources that the group has and the distractions that come from a Presidential election year. The goal of I-732 was to gain bipartisan support for climate action, but it admits that the tax has received less support from the business community, civic groups, progressives, and conservatives than expected. Many of the organizations that CarbonWA would have expected to receive support from—advocates for climate action, mainly—have rallied behind the Alliance, even though the coalition's route to carbon policy is much slower and less clear. Due to tensions between CarbonWA and the Alliance, many organizations and individuals that want to see a carbon policy passed in Washington State tend to support one policy over the other, not both.

We found that information did not flow as freely as one might expect given the geographic proximity of the two jurisdictions. The government-created groups CLEW and CERT featured members from Washington only. While liaisons from BC, California, and the EU were brought in to report on their carbon pricing experiences, members of other jurisdictions were not asked their recommendations on carbon pricing. As we have noted, carbon pricing policies suffer from diffuse benefits and concentrated costs (Harrison 2012) -- those who benefit from CO₂ abatement span the globe whereas a relative few must bear the costs of the policy. This problem is exacerbated in groups like the CERT, which comprised only those positioned to bear costs of the policy. A BC participant in the CERT process would have undoubtedly pushed for carbon pricing to achieve global benefits and to establish pricing uniformity among neighboring trade partners.

Ultimately, increasing the scope of involvement in workgroups and committees such as CERT fosters more expansive policy dialogues and policy learning communities. Breadth and diversity of participants brings in more experience, perspective and knowledge in all parts of the lesson drawing process. Do doubt it would accelerate policy learning.

7.4 ELEMENTS OF THE POLICY DESIGN

The policy transfer literature clearly identifies elements of the policy that can be altered as the policy is transferred. We found several elements that were examined during the lesson drawing process. These included:

- the rate and planned increases to the rate;
- how revenue neutrality is achieved;
- taxed fuels;
- taxed entities; and
- transparency.

For the most part, CarbonWA chose to copy the BCCT, but it made some adjustments. The most significant change was the way in which revenue neutrality is ensured. This was in part due to necessity as Washington has no income tax. In spring of 2016, after the ballot initiative had been finalized, a discussion ensued between the Washington Department of Commerce and CarbonWA over the estimated revenue flows and tax cuts (Washington State Department of Commerce 2016). Commerce contended that CarbonWA miscalculated revenue flows and tax revenue declines. They found the measure would cost the state considerably more, and thereby impose fiscal pressures on the legislature to cut expenses or find other revenue streams. Interestingly, the British Columbian public was concerned about the opposite problem: the government not spending all of its carbon tax revenue. To remedy that possibility, they tied the salary of the BC Finance Minister to the revenue neutrality of the tax. This was not a policy feature CarbonWA chose to include in its proposal.

As we noted above, CarbonWA proposed to implement a carbon tax of \$15 per ton in the first year and \$25 per ton in the second year, which would then increase by 3.5% annually plus inflation (CarbonWA 2016.2). This differed slightly from the BCCT, most notably in the inclusion of the 3.5% inflation adjustment.

7.5 EXPLORING THE LACK OF LESSON DRAWING IN WASHINGTON

In examining how policy transfer and learning occurred, we examined the role that key documents in BC played in the WA state dialogue. Presumably, a learning-based process would seize upon data in the BC experience and discuss its relevance in WA. To assess Washington's use of formal reports and expert opinion we identified four papers and reports that address experiences with the BCCT regarding equity, employment, and industry concerns. These are issues relevant in the Washington carbon debate and they will gain increased media attention in the coming months as I-732 goes to ballot in November 2016. Each report is a potential lesson to be drawn from the BCCT as illustrated by the report's authors and backers. Our goal was to identify whether policy actors in Washington utilized the following reports.

7.5.1 Key reports from British Columbia

Report on employment effects: A working paper from the University of Calgary explored the impacts on employment from the BCCT. It found that the tax “generated a small but statistically significant 2 percent increase in employment over the 2007-2013 period” (Yamazaki 2015) and provided evidence that such taxes may not adversely affect employment. This paper was cited by others in BC reporting on the tax’s success, most notably by Murray & Rivers (2015). We have found no mention of the report by policy actors in Washington.

Report on household income effects: In July 2013 a report was released by the private Canadian research firm Navius Research Inc. regarding the BCCT’s effect on household income. The report concluded that the average household will be made better off by C\$121 annually in 2020 (Melton & Peters 2013). The authors also wrote an op-ed in the *Vancouver Sun* detailing their findings. The report was cited by the State of Washington Department of Commerce in its 2013 report titled, *Forecasting the Impacts of Carbon Tax Policy in Washington State* (Mori et al. 2013) as well as by CarbonWA co-chair Yoram Bauman in 2013 on his Stand-Up Economist web page. Those were the only citations found in the Washington-based dialogues.

An academic paper on the impacts of carbon tax and revenue neutrality in British Columbia: This was released in 2014. Using a computable general equilibrium (CGE) model, the authors found the tax to be “highly progressive” (Beck et al. 2015). The paper was cited by 22 others, albeit none of those citations feature a connection to Washington.

Report on business and trade effects: An academic paper released in 2015 evaluated the evidence in support of BC’s decision to exempt the agriculture industry from the carbon tax. After reviewing the economic implications on trade-exposed industries the authors claim that the agriculture exemption was unwarranted (Rivers & Schaufele 2015). This paper has been cited by seven others, yet none feature a direct connection to Washington.

7.5.2 BC Reports in CarbonWA Dialogues

CarbonWA’s weekly newsletters and news announcements are the organization’s primary means of communication with its members. All of these posts are available for the public on CarbonWA’s website. We reviewed the 173 newsletters that had been shared by CarbonWA between May 14, 2009 to March 18, 2016 to search for mentions of the key reports from British Columbia. We found that, of these four reports, only one -- Rivers & Schaufele (2015) -- was mentioned, and it was mentioned *only once*. We found this surprising given that each of the four reports could provide a success story for the BCCT, something of practical value to CarbonWA.

It should be noted that two of the four reports cited above were published in 2015, with the earliest released in 2013. The seven-year lag between BCCT implementation and evaluation illustrates the gestation process required to comprehensively judge a new policy. We expect that lag may inhibit the learning process.

We searched for key words related to the report themes in CarbonWA’s newsletters from 2009 through

2016. Those themes most discussed were “social justice,” “polling,” “polls,” “communities of color,” and “economic impacts,” in that order. This is indicative of how the Washington dialogue regarding carbon pricing has gone. When we searched for carbon pricing themes outside of the main topics of these four reports, we found that the topic of greenhouse gas emissions was the most prominent. However, concerns over distributional income, GDP, and business competitiveness have played important roles in the discussions. These concerns have received more attention in the Washington dialogues than they did in BC.

8. DISCUSSION

8.1. CARBON PRICING

The two most prominent carbon pricing policies -- carbon tax and cap and trade -- continue to compete in the policy sphere. British Columbia, Alberta, Massachusetts, and Washington have or are considering a tax. California, ten Northeastern states, Ontario and Quebec engage in cap and trade. Washington's Department of Ecology recently proposed a cap and trade system for large polluters. EPA's new Clean Power Plan includes a cap and trade alternative. Clearly, in the contest between carbon tax and cap and trade there is no obvious winner. However, both are carbon pricing schemes and popular acceptance for carbon pricing appears to be on the rise. In Washington, CarbonWA points to the success of BC's carbon tax while the executive branch of the government and the Alliance points to the success of cap and trade schemes in jurisdictions elsewhere. Experts, policy makers, and lay persons in Washington do not agree on the preferred instrument for the state. We expect that, if carbon taxes and cap and trade systems continue to be deployed successfully, other states and provinces will encounter a lack of consensus as to which mechanism is preferable.

There is pressure toward carbon pricing uniformity for all jurisdictions, both in price on carbon and in specific policy mechanism. Carbon pricing convergence benefits city-city, state-state, and nation-nation relationships. Consistent prices reduce competitive disadvantage between jurisdictions, mitigate policy leakage, and result in broader-based policies that cover more emitters (World Bank 2015).

The way forward for both jurisdictions studied in this project is in flux. Washington has two potential policies on the table: A BC-style carbon tax will to be on the ballot in November 2016 and a cap and trade policy modeled by the state's Department of Ecology. Ecology recently released a proposed cap and fee policy. Its Clean Air Rule, a proposed "cap and reduce" scheme would apply to approximately 70 emitters whose CO_{2eq} emissions exceed 100,000 tons, following push-back from various industry groups that have threatened to leave the state if the plan is implemented. The Alliance for Jobs and Clean Energy, recently announced its intention to build public support for a revenue neutral cap and fee program that will mitigate social injustice, improve water and fire management, and create a "Clean Energy" economy in Washington.

In BC, climate talks at the federal level beget uncertainty for the future of its carbon tax (Interview Harrison 2016). Discussions between the prime minister and premiers are scheduled to propose a carbon pricing policy by October of 2016. We are witnessing pressure toward pricing uniformity in Canada. Like Washington, BC may soon be mired in the policy transference process, whether from coercive or voluntary means.

8.1.2 Unexamined questions

In our scrutiny of the press and policy literature about the BCCT, we found little evidence that policy actors considered one of the potential problems of a revenue-neutral carbon tax modeled off the BCCT (Carl & Fedor 2012: 19). This is the inconsistency between making provincial tax revenues more dependent upon carbon emissions and the overarching policy goal of reducing GHG emissions. In its effort to make the tax revenue neutral, British Columbia cut its corporate income tax and essentially replaced those revenues with the carbon tax. Presumably, if carbon emissions fall and the carbon tax revenues decline, this will put pressure on the government to cut expenses or to raise more tax revenue.

Both of these options are politically difficult. Arguably, this makes the Province dependent on continued or even rising carbon emissions. This consideration was not raised in the policy dialogues in Washington State.

8.2. POLICY TRANSFER

One of the outcomes of the policy transfer process has to split environmentalists in Washington (Brunner 2015a). We found that different rational actors devising policy recommendations for the same problem arrived at different conclusions. This has been the case with carbon pricing and continues to be a source of discord in Washington, even when the necessity for carbon pricing is held in mutual agreement among disagreeing groups. This reinforces the notion within the policy transfer literature that policy recommendation is not an objective process and lessons are drawn selectively by different stakeholders.

Our evaluation of policy transfer recognizes that policy lessons may feature confirmation bias. Those in favor of a cap and trade system (such as that in California or the European Union) cite increases in BC's GHG emissions from 2012 to 2013 as evidence of carbon tax policy failure (Wieting 2015). Those agents seeking a BC-style carbon tax in Washington point to BC fuel consumption that fell 16 percent in the six years following the tax shift while consumption rose three percent in the rest of Canada (Beaty et al. 2014). These two examples cited by the NW Progressive Institute (a partner with the Alliance) and CarbonWA, respectively, illustrate selective lesson drawing from the same policy experience. Once policy acceptance has been established -- see Batel (2013) -- lesson drawing may be used selectively for strategic ends (Tuler, Dow, Webler in press).

We think of policy transfer as a learning process, but, it begs the question: Who is teaching and Who is learning? BC is a teacher for other areas considering a carbon tax, yet the province continues to learn as its own policies continue to be evaluated. Many actors appear more inclined toward persuading others than learning from others. While CarbonWA was in a position to learn from BC, its key actors, such as Bauman, expressed desires for carbon taxation long before BC's tax shift in 2008. Bauman uses BC as an example to generate policy acceptance for the carbon tax that he would like to become law. That said, it is also clear that Bauman did learn from the BCCT experience and he acted on that by changing the CarbonWA proposal. He saw a policy that could be improved by tethering the tax rate increases to inflation and he gained an understanding of the political challenges that come with passing such a tax.

8.3 INDUSTRIAL FLIGHT

One of the dangers of a carbon tax in Washington is that it will cause carbon-dependent industry to flee the state. The vulnerability of a state to this risk is based on several factors. One factor is the ability of a taxed firm to flee the state and how far it can feasibly go. For instance, some firms may be able to move operations to the east coast, while others may need to remain in the Northwest. Another factor is the vulnerability of firms' profit margins or market segment to the carbon tax. Firms that are highly dependent on electricity rates may find the tax onerous, depending on the fuel mix of the electricity sector. A \$30/ton carbon tax is estimated to raise the price of natural gas by 17% and coal by 80%. There is large variation across states in fuel mix for the electricity sector. For instance, hydropower supplies 70% of Washington's electricity while Virginia generates about 2% of its electricity from hydropower.

9. CONCLUSION

Carbon policy is of growing importance as the world and major industrial countries continue to do little to nothing to abate greenhouse gas emissions. Two policy mechanisms are favored: cap and trade or carbon tax. Once the darling of conservatives, carbon cap and trade failed at the federal level in the United States Congress early in President Obama's Administration for reasons having to do with the strong conservative turn in the Republican party that made compromise on environmental issues unpopular. However, cap and trade was recently resurrected when it was included as an alternative available to states in the EPA's Clean Power Plan (presently stalled by the Supreme Court). Cap and trade was adopted and implemented by California in 2011. Meanwhile, a carbon tax has been implemented in several Scandinavian states for many years and in British Columbia since 2008. BC is famously recognized as implementing the first significant carbon tax in the Americas.

British Columbia's carbon tax revenues were recycled back into promoting business in the province and shielding the poor from rising energy costs. The yearly increase was halted in 2014 as the effects of the tax were reviewed. On the whole, reviews were positive and showed that the tax reduced greenhouse gas emissions while not harming the provincial economy. In fact, compared to other provinces, BC's economy continued to grow, even as emissions slowed. Other provinces saw emissions increase during the same time period.

The widely reported success of the BC carbon tax, the similarities among the BC and Washington State economies (in terms of energy), and the election of a Democratic Governor committed to reducing greenhouse gas emissions suggested the possibility that Washington would adopt BC's carbon tax.

We investigated the way Washington State learned about and considered copying the BC carbon tax. We hypothesized that Washington would engage in a learning process to determine if and how the BCCT or a variant thereof could work in Washington State. Our goal was to understand:

- What are the main avenues by which policy actors in Washington learned about and considered adopting the BCCT?
- Who were the actors and institutions engaged in the process?
- What evidence proved salient in policy dialogues in Washington?

We proposed a model in which policy transfer is understood as a learning and persuasive process that occurs within a societal landscape comprising politics, economics, culture, and society equipped with histories and contemporary trajectories.

We found that policy learning happened among voters through customary media channels, although the complexity of the learning was low. Among policy elites in Washington we were surprised to learn that there were so few opportunities for direct communication among BC provincial officials experienced in the tax and counterparts in Olympia. The Governor-led process to determine which carbon policy the state would invoke did not rely heavily on reports and studies produced about the BC carbon tax. Indeed, we were struck by the amount of learning that did not happen.

An interesting aspect of this case was the emergence of two new policy actors in Washington: CarbonWA and the Alliance for Jobs and Clean Energy. As the legislature failed to act on carbon policy,

these two actors became increasingly important. CarbonWA succeeded in getting a public initiative on the November 2016 ballot while the Alliance has promised to organize its own initiative in a latter year.

It was difficult to ascertain what evidence and argument was persuasive or instrumental in shaping policy actor's opinions about the future of carbon policy in Washington. We found that well-informed rational actors in Washington seeking to implement carbon pricing arrived at different conclusions. The Governor and many legislators came to believe that cap and trade was a superior option to a carbon tax, despite their knowledge of the BC experience. Governor Inslee is cornered into the role of pragmatist where perceived political feasibility is critical for a recommended policy. His legacy rests, in part, on passing a comprehensive carbon pricing system for Washington state. Hence Inslee's recommendation seems to be what is most likely to be circumnavigate by a partisan government. CarbonWA, of course, imitated the BC carbon tax and was well informed of the tax's performance in Canada. Bauman of CarbonWA, an economist, is also driven by the ideological notion of "first best" policies that guide most economists and assumes others ought to think the same way, particularly when the evidence is compelling. Finally, members of the Alliance, including several climate activists, first supported the Governor's cap and trade plan and then, when that failed, they refused to back CarbonWA's initiative, preferring no action to a tax. We found little evidence that Alliance members were familiar with the BC carbon tax.

The idiosyncratic nature of the policy learning in Washington about their neighbor's extensive experience with the carbon tax may, in part, be explained by Americans' aversion to taxes and distrust in government. This policy debate occurred at a time when conservative forces in Washington state were growing stronger and there was continued opposition to the beliefs that climate change is happening or that governments can or should attempt to reduce greenhouse gas emissions. State Senator Doug Erickson called the proposed cap and trade system "a tax on freedom." Such political rhetoric may carry more weight among conservatives than the reasoned learning of a policy experiment by their neighbor.

As governments experiment with carbon cap and trade systems and carbon taxes, it becomes imperative to understand the potential for diffusion of policy from the experimenters to other venues. Climate change is anthropocentric and accelerating. Even the recent greenhouse gas targets established under the Paris Climate Agreement, if achieved, will not keep warming below three degrees Celsius. The world is changing as we continue to fail to act. Ideally, democratic societies ought to adopt a reasoned and evidence-based approach to policy making. The result of the public initiative I-732 on a carbon tax for Washington state may be the best bellwether of the direction America will move on climate change.

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