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# A MANDATE FOR CANADA



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In advance of the 2019 federal election, MLI has released a new series designed to offer practical public policy recommendations for the post-election government. Titled “**A Mandate for Canada**,” this series of short analyses will cover a range of pressing issues that any incoming government will need to address, including Indigenous affairs, foreign and security issues, and economic and fiscal policy.

## The Case For a Carbon Tax: What Went Wrong?

Philip Cross

### Introduction

This paper traces the evolution of the case advanced by proponents of carbon taxes in Canada and why opposition has grown and solidified. The paper does not argue for or against carbon taxes. It is a study of a public policy failure to communicate and convince, of lessons not learned from past public resistance to consumption taxes, and of the lack of practical understanding of innovation, the most important process driving economic growth.

What went wrong for the advocates? Early on, a carbon tax attracted some bipartisan backing with the promise of a more efficient market-based way to reduce emissions and improve the tax system. This was reflected in support for a carbon tax from esteemed academics such as Jack Mintz and leading Conservative politicians, including Jim Prentice, Preston Manning, Patrick Brown and Michael Chong. Even then, some made their support conditional on strict adherence to principles such as the revenue neutrality of the overall tax burden (Mintz and Olewiler 2008), while other endorsements were contingent on the US adopting a similar plan so industry was not at a competitive disadvantage (Prentice with Rioux 2017, 2). Widespread support also was encouraged by preliminary research showing a small tax hike might be enough to curb carbon emissions, especially when \$100 seemed the new normal for the price of a barrel of oil which by itself would help substantially lower consumption.

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Over time carbon tax support has narrowed on the political spectrum, faltered intellectually, and never gathered traction with a public worried directly about the cost to their energy bills and indirectly about the competitiveness of our industries and their jobs. The traditional resistance of North Americans to consumption taxes meant the arguments for and the implementation of a carbon tax had to be exemplary. They evidently were not.

Carbon tax advocates never learned from the failure of economists to build broad electoral support for the benefits of consumption taxes such as the Goods and Services Tax (GST). The implementation of carbon taxes contradicted promises of revenue neutrality, making them a partisan issue with proponents and increasingly associated by detractors with higher taxes and a more expansive state. Meanwhile, the economics of inelastic demand and low oil prices after 2014 implied hefty taxes would be necessary, further draining support from people wary of more government. The Republican sweep of the 2016 Presidential and Congressional elections eliminated any chance of a US carbon tax, leaving Canadian industry at a disadvantage. Finally, the reliance on higher prices from taxes to reduce emissions ignored the dynamic role technological innovation plays in capitalist economies in addressing large and seemingly intractable problems.

## North America dislikes consumption taxes

North Americans have long demonstrated a latent hostility to consumption taxes. For carbon taxes, this aversion was reinforced by the higher energy consumption inherent to North America's geography and climate. Academic proponents never adapted European arguments for a carbon tax to North American realities and traditions.

There is no national sales or value-added tax in the United States, reflecting a resistance to indirect taxes that dates back to the Boston Tea Party and the American Revolution.<sup>1</sup> The GST in Canada has been unpopular since its introduction in 1992. Both Liberals and Conservatives in Canada have won power by promising to eliminate or reduce the GST. The Liberal party swept to a majority in 1993 on a platform that included the abolition of the GST.<sup>2</sup> Reducing the GST rate was a centrepiece of the Conservative platform when that party triumphed in 2006. The same hostility to the GST holds in provincial politics. Given the chance to vote for replacing its provincial sales tax with a tax harmonized with the GST, British Columbia voted against the new tax in a 2011 referendum. Polls show most Canadians would follow BC voters if given the chance.<sup>3</sup>

North Americans historically have always preferred income taxes to consumption taxes. Advocates of a carbon tax ignored this fundamental difference between North America and Europe. European nations prefer consumption taxes such as value-added taxes (the counterpart to Canada's GST) to income taxes. North America relies much more on income taxes than consumption taxes, despite the endorsement of the latter by most economists. In the US, for example, 49 percent of all taxes are on income, while only 17 percent are on goods and services (the latter are mostly state sales taxes as the US has no national sales tax). By comparison, the OECD averages are 34 percent for income taxes and 32 percent for consumption taxes (social security contributions are about the same in the US and the OECD at 24 and 26 percent respectively).

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The enmity of Europeans to direct taxes has its historical roots in authoritarian rulers who used such taxes to fund unpopular wars (Brooks 2014, 102). Given this background, it was easier for governments in Europe to sell consumption taxes to the public, although, to judge by France's recent *gilets jaunes* protests, persistently weak incomes appear to be undermining support for a carbon tax.

In North America, income taxes were introduced to finance the First World War, and then raised substantially to bankroll the Second World War and the Cold War. All these wars had broad public support, and so income taxes were at least grudgingly accepted.

Economists have ignored the public's perception that while consumption taxes may be more efficient, they are inherently unfair since they lack the progressivity of the income tax system. A progressive income tax drew public support because of the appeal of making the rich pay more. Research has found that most consumption taxes, including the carbon tax, are regressive.<sup>4</sup> Sending rebates to households based on the average person's consumption does not fully compensate low income people who spend an above-average share of their budget on gasoline and home heating (because, for example, if they live outside of the city core to save on housing) (Emery and Guo 2019). If proponents of a carbon tax had been more in tune with the skepticism of North Americans to indirect taxes, they would have framed their arguments to address concerns about equity rather than focusing mostly on efficiency.

Another flaw in asserting the greater efficiency of consumption taxes is the lack of substantive evidence from the GST in Canada. Economists are too reliant on theory in insisting on the superiority of consumption taxes. There has never been a major study quantifying the benefits of adopting the GST (although this could be done by comparing Canada with the US after implementing the GST) or whether Ontario's economy became significantly more efficient after it adopted the Harmonized Sales Tax (HST) in 2009. Economists have not documented the penalty Alberta and BC pay because they have not adopted the HST, even as growth in these provinces outstripped the national average in recent decades (economists tout BC's superior growth as proof that a carbon tax works, but are silent about what this implies for the HST). The tone-deafness of economists to North American resistance to consumption taxes demonstrates why conservative politicians in the UK declared that "a political strategy based on economic theory is a house built on sand" (Moore 2013, 647).

Economists in Canada never learned the lesson from the GST that there is very little public support for consumption taxes. Just because Ontario and BC implemented an HST with the GST under unrelenting pressure from the federal department of finance (which used the 2008-2009 recession to bribe these provinces into harmonizing) does not mean they had won the battle for public support: losing the 2011 referendum in BC proved just the opposite. In arguing for a carbon tax mainly on efficiency grounds, they largely repeated the same unconvincing arguments that they had made in favour of a GST. Until they change tactics, economists are going to face a wall of public skepticism and resistance. Pointing to Europe as an example of the greater efficiency of consumption taxes is hardly convincing to a public that associates Europe with bloated bureaucracy, low productivity, high unemployment, and widespread tax evasion.

## Efficiency claims ring hollow

The specific claim that a carbon tax creates a more efficient tax system is not any more obvious to the public than the case for the GST. The superiority is conditional on a tax on carbon emissions being offset by lower income taxes. This almost never occurred because the administration of carbon taxes was left to cash-strapped provincial governments, most of which used the revenues to bolster their own sagging finances. Rising overall provincial tax levels prevent advocates from relabelling carbon levies as a price on pollution and not a tax used to finance more government spending. Even a fiscally healthy province like BC did not keep the promise of rev-

enue neutrality. After 2012, BC stopped returning additional carbon tax revenues to ratepayers, instead directing these revenues to an industrial policy favouring certain industries ranging from digital media to agriculture (Murray and Rivers 2015, 6-7).

The greater efficiency of a carbon tax regime also is contingent on governments removing all other vestiges of command and control regulation of carbon emissions, ranging from mandatory standards for vehicle gas mileage to closing coal-fired power plants and banning tanker traffic off the BC coast. No government is remotely willing to renounce such regulations simply to satisfy academic requirements for more efficiency. Thomas Piketty notes that a successful carbon tax has to tax all forms of energy at rates that depend only on the amount of emissions; taxing gasoline consumption for drivers should not be greater than taxes on industries using oil in chemicals, as Canada currently does (2016, 36). Nor has any government taken steps to extend carbon taxes to a tariff on carbon imports; without that, we are imposing a carbon tax on our exporters, putting them at a competitive advantage, while allowing carbon imports to enter without a penalty. The result is a hodgepodge of carbon taxes, extensive regulations and subsidies, and high levels of income tax which have not lowered carbon emissions or improved tax efficiency even as they have hampered the competitiveness of Canadian industry against US firms.

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## The carbon tax becomes a partisan issue

Ten years ago, support for and opposition to a carbon tax did not strictly follow partisan lines. Some Conservative politicians advocated for the tax, although Stephen Harper campaigned against carbon taxes in his winning campaign in 2008. On the left, in 2009, the provincial NDP party in BC tried to mimic Harper's success with an “Axe the Tax” campaign against BC's carbon tax (Murray and Rivers 2015, 3).

However, in recent years, the carbon tax has become a more partisan issue. The 2016 carbon tax deal between the federal and provincial governments helped undermine bipartisan support for the tax because the deal was a consensus among left-wing governments (at the time, only Saskatchewan had a Conservative government). Carbon tax supporters should have made more efforts to cultivate a bipartisan consensus with potential opponents rather than basking complacently in the support of people whose endorsement was almost automatic.

Conservative carbon tax advocates such as Michael Chong and Patrick Brown quickly found themselves losing support within their own parties. Chong was defeated in his candidacy for leadership of the Conservative Party of Canada (and regularly booed by party members during debates when he called for a carbon tax). Brown was ousted from his position as leader of the Ontario Progressive Conservatives just five months before the 2018 provincial election. All three of the leading candidates to replace Brown were opposed to the carbon tax, with Doug Ford emerging as the winner of both the leadership race and the provincial election. Ontario quickly joined Manitoba and Saskatchewan in opposing the federal carbon tax, soon to be followed by Alberta and New Brunswick when Conservative parties won those provincial elections.<sup>5</sup>

This partisan divide deepened when the implementation of a carbon tax often was flagrantly not revenue neutral, opening it to the charge that it was just another government tax grab, an accusation Preston Manning seconded (Taylor 2019). Academic proponents of the carbon tax were disturbingly silent that the carbon tax in practice was neither revenue neutral nor supplanted existing regulations and fuel taxes that were necessary conditions for creating a more efficient tax system. This gave the impression that they attached little importance to the implementation of long-held conditions that skeptical economists had insisted on in return for their support.

## Inelastic demand implies large carbon taxes after oil prices plunge

As political support for carbon taxes slipped, so did its intellectual underpinnings. Early research produced promising results that small carbon taxes could sharply lower energy consumption, largely based on a short sample for BC between 2008 and 2012. BC adopted a \$10-a-tonne carbon tax in 2008, with increases of \$5 a tonne every year until it reached \$30 in 2012 after which it has been frozen.

Early research on the BC carbon tax claimed that price increases resulting from the tax had 7.1 times more impact on reducing fuel consumption than ordinary fuel price increases (Elgie and McClay 2013, 4). Rivers and Schaufele estimated a multiple of 4.9 for a carbon tax price effect (Rivers and Schaufele 2012, 2). The results implied that carbon taxes would not have to be sizeable to achieve climate change goals. However, considerable uncertainty surrounded the impact the BC tax actually had on fuel consumption; depending on the study, the estimated reduction in greenhouse gas (GHG) emissions varies from 8.5 percent to 17 percent, a reflection of the difficulty of making precise estimates (Murray and Rivers 2015, 8). This wide range reflects that the results did not fully account for the temporary effect of the 2008 recession and the increase in cross-border fuel shopping that occurred when the exchange rate recovered after 2009. When Bernard and Kichian at the University of Ottawa adjusted for these effects by excluding 2008 and by focusing only on diesel fuel – which is not affected by cross-border shopping because carriers pay diesel tax based on distance travelled rather than purchase location after Canada harmonized its diesel tax with the US in the 1990s under the International Fuel Tax Agreement – they found quite different results (Bernard and Kichian 2017, 5).<sup>6</sup>

Later research found that fuel consumption was less responsive to tax changes than initial studies suggested. As a result, Bernard and Kichian estimated that a carbon tax of \$262 a tonne was needed to achieve the Paris Climate Accord goals by 2030, a level no government was willing to contemplate (Bernard and Kichian 2018). Marc Jaccard at Simon Fraser University published similar findings of \$200 a tonne; the environmental economist David Sawyer estimated \$180 a tonne was necessary by 2030 (McCarthy 2016). Not only is demand inelastic, but an NBER study concluded that “it becomes increasingly more expensive to achieve ever-larger target reductions of emissions in the short run” (Cullen and Mansur 2015). Furthermore, the same study noted that the impact of carbon taxes depends on the market price of fossil fuels; taxes are more efficient when prices are low, but none of the proposals for a carbon tax clarified how the tax would interact with fluctuating world oil prices (which in Canada includes the effect of changes in the exchange rate, since our domestic oil price is set in US dollars).

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It is also notable that only Bernard and Kichian extended the study of the BC carbon tax beyond 2012, when fuel consumption in BC began to rise substantially. As a result of this post-2012 increase in fuel consumption, Statistics Canada data shows that the 5.1 percent drop in GHG emissions in BC between 2005 and 2016 was far less than the declines of 21.5 percent in Ontario and 10.6 percent in Quebec. This undermines claims of magical results for the BC carbon tax.

The inelasticity of energy consumption to prices undermined the promise that a small carbon tax would be sufficient to lower demand, implying that tax increases must be significant (“damaging” in the words of Kenneth Markus of the University of Colorado) to be effective. This was especially true after world oil prices tumbled in 2014 and stayed low as surging US shale oil production structurally altered the global market. Global oil demand has risen since 2014, with increases in all regions from China to Europe. As a result, oil production facilities, including the oil sands, have not become the “stranded assets” some predicted and seem assured of demand for their product for the foreseeable future.

The prospect of large tax hikes further eroded political and public support for the carbon tax, especially among proponents of limited government. The federal government responded by reiterating in 2019 that it has no plans to increase the tax beyond \$50 a tonne. However, the unwillingness to impose a high carbon tax demonstrates that higher prices were not the primary tool for lowering emissions and that substantial improvements to tax efficiency were never a priority for governments. Given the inelasticity of energy consumption, price hikes of 5 to 11 cents a litre due to the federal carbon tax plan seem more like virtue signalling than a serious attempt to solve a problem or improve the overall efficiency of the tax system. As Professor Pierre-Oliver Pineau of HEC (École des hautes études commerciales de Montréal) observed, “The carbon tax, to this day, has had zero effect on the habits of Quebecers” (Olivier 2017). Other government measures also are mostly symbolic. For example, the recently announced plan by the city of Montreal to phase out home heating oil is essentially irrelevant in a province where oil accounts for only 6 percent of residential use (Statistics Canada 2019).

Canada is not alone in having carbon taxes at such low levels that they reek more of tokenism than a sincere attempt to change consumption patterns. Only 1 percent of emissions covered by carbon pricing schemes around the world fetched more than \$40 a tonne, with three-quarters of emissions priced under \$10 a tonne (The Economist 2018). The lack of a serious commitment to climate change policy is reinforced by the exemption given to GHG emissions from hydro power, which is misleadingly portrayed as emissions-free (the notion that reservoirs submerging thousands of acres of trees has no impact on emissions is also contradicted by the importance that governments attach to tree-planting programs).<sup>7</sup> Increasing the price of gasoline by 11 cents a litre is a pittance that seems like a papal indulgence from the Middle Ages; an inexpensive way of getting oneself seemingly on the right side of virtue, without having to alter the fundamentals of one’s life.

## Carbon taxes or cap and trade?

Canada’s almost exclusive focus on carbon taxes and not a cap and trade system reinforces the impression that the exercise was motivated more by tokenism than by a sincere attempt to fundamentally change energy consumption. A cap and trade system sets a specific reduction in carbon emissions, letting prices fluctuate to whatever level is need to achieve this goal (which is why Daniel Yergin calls it cap and tax) (2011, 508). A carbon tax imposes a fixed price, but does not guarantee a specific reduction in carbon emissions.<sup>8</sup> For some economists, the benefit of a carbon tax is that it incorporates negative externalities not that it lowers emissions; for them, users can consume carbon as long as they pay all the costs to society.

While both systems use prices to reduce demand, there are some differences. Carbon taxes are visible to consumers, while cap and trade effects tend to be hidden in prices. Prices under carbon taxes are less volatile, although the volatility of prices under cap and trade could be confined within a pre-determined range. Cap and

trade is easier to apply to large emitters, but this invites lobbying by industry for exemptions, usually for large emitters, which makes the policy self-defeating. The imposition of a set carbon tax does allow governments to estimate the revenues available to reduce other taxes, but in practice only BC made a tentative move to do so.

The unwillingness of most governments to adopt a cap and trade system supports the argument that governments are not truly committed to reducing emissions to their 2030 targets. Avoiding the hard targets under a cap and trade system and risking the loss of control over the possible price hikes that would likely be imposed on energy consumers suggests that governments were always more worried by the potential consumer backlash than motivated by strict adherence to lower emissions. Government reluctance to use cap and trade also may reflect a sensitivity to the optics of turning pollution into a commodity to be bought and sold, which “does the grave disservice of removing ‘the moral stigma that is properly associated’ with pollution,” in the words of Michael Sandel (quoted in Yergin 2011, 471).

Promising only small carbon taxes implied that the bulk of lower carbon emissions would result from other regulations and policies, such as the phase-out of coal plants, planting more trees, regulating vehicle gas mileage, and subsidizing wind and solar power. If governments adopting a carbon tax relied mainly on other tools for the bulk of their reductions of carbon emissions, how could they refute opponents who wanted to get rid of the carbon tax and use regulation alone to achieve all the goals? Even the Green New Deal proposed for the US relies on regulation, not carbon pricing. The intellectual, political, and economic arguments for a carbon tax all were weakening. Carbon pricing in North America seems to be reaching a dead end.

## The carbon tax reduces competitiveness with the US

Carbon taxes, as they have been implemented, have put Canada at a competitive disadvantage with the United States, all the more so because our exports have always been energy-intensive due to Canada’s ample supply and low cost of energy. As former ambassador to the US Derek Burney said, it is “suicidal for Canada to act unilaterally in a manner not replicated by the US” (Burney and Hampson 2014, 26). Instead, Burney has called for Canada to “design a common approach to carbon emissions with the US” to ensure our industries are not disadvantaged (Burney and Hampson 2014, 65). Former Ontario Premier Dalton McGuinty recognized that when it came to carbon emissions, “if Ontario moved forward on its own this could unfairly penalize our industries; orders could be shifted to more accommodating plants in Michigan or Ohio. We had good ideas and ambitions, but we knew that to act on our own could cause economic damage, damage we could ill afford in the middle of a recession” (McGuinty 2015, 153).

The carbon tax levied in Canada applies more to domestic production of carbon than imports. If domestic production is targeted, Canada faces the European conundrum of falling carbon production even as carbon consumption rises steadily because of imports from carbon-intensive countries such as China (Helm 2013, 7). One solution to this problem of carbon “leakage” is to tax imports from any country not having a carbon tax, and refund the carbon tax to exporters shipping to countries without a carbon tax. However, this is difficult to implement for production involving global supply chains.

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Michael Spence notes that the best way to avoid the problem of tracking emissions across global supply chains is to impose a carbon tax on each industry around the world. However, such a tax requires a global agreement that most countries would never sign (especially the US) (Spence 2011, 221). Fischer and Salant elaborated the case that a wide range of countries need to adopt carbon pricing for global emissions to fall significantly. If only a small number of countries tax carbon, world oil prices would fall, stimulating demand in those countries where emissions are not taxed. On top of this “spatial” leakage of carbon emissions, there is intertemporal leakage. This is the so-called “green paradox,” where selling fossil fuels in the future becomes so unappealing that producers have an incentive to expand production in the short-term before their supplies become worthless (Fischer and Salant 2012).

Looking at the international pattern of GHG emissions, while the US has no national plan to reduce them and did not sign the Paris Climate Accord, it is one of the few countries on track to lower emissions. This is mostly attributable to a 25 percent drop in emissions from coal plants (Gold 2014, 265). US power plants shifted to coal production in the 1970s when concerns about energy shortages led Congress to ban the use of natural gas. Today, substituting cheap natural gas for coal in power plants in the US is both economic and reduces emissions.

## Messaging problems for the carbon tax

There have been several problems with the basic framing of the message advocating for carbon taxes. As noted earlier, one is that the argument largely focused on efficiency and not equity. The promise of a more efficient tax system itself was quickly undermined when governments did not make offsetting reductions to other taxes and regulations which are required to make the system more efficient. A focus on the efficiency message also did not allow proponents to shift to other messages when their campaign began to falter with a public already skeptical about the equity of consumption taxes.

A broader problem was the condescending tone of the carbon tax advocates, who were self-assured of the veracity of their arguments. This tone may have been encouraged by the early success in negotiating the federal-provincial agreement in 2016, breeding over-confidence even as the results of the US election served as a warning about the historical North American reluctance to endorse consumption taxes. This made proponents appear arrogant in dismissing opposing arguments instead of trying to understand and address these concerns. Essex and McKittrick noted that from the beginning, supporters of a carbon tax were less interested in a free and open debate in the marketplace of ideas than “authoritarian grandstanding” before “a fortress, heavily defended by an arsenal of authoritarian pronouncements designed to intimidate outsiders into staying away” (Essex and McKittrick 2002, 10). This attitude hardly conforms with a dispassionate academic approach, nor does it cultivate sympathy from a skeptical public.

The over-confidence of carbon tax proponents was reflected in the number of them that worked only part-time to make the case for the tax. For example, the head of the EcoFiscal Commission, Christopher Ragan, is also a professor at McGill University and is also part of a panel advising the federal government on how to improve long-term economic growth. It is demanding to generate new ways of delivering creative messages for a carbon tax when taking on so many other tasks.

A lack of analytical rigour undermined the academic aura surrounding the superiority of a carbon tax. This was most evident in the interpretation of the results for BC, which showed that small price increases led to inexplicably large declines in energy consumption. Unexplained results should have drawn skepticism, not unquestioning acceptance. Not updating the BC results past 2012 suggests that proponents had little confidence that the results would be reproduced. Having found the result they wanted, researchers appeared reluctant to see if the evidence would withstand the repeated probing and testing that a truly scientific approach mandated. More broadly, this was symptomatic of speaking with certitude about areas where, in fact, there is a great deal of uncertainty, ranging from the impact of carbon pricing on demand to the evolution of technology.



## Innovation is the lowest cost way to reduce emissions

It is frequently claimed that carbon taxes are the least costly and therefore most efficient way of reducing carbon emissions compared with heavy-handed regulations or subsidies. This ignores that technology potentially offers the lowest cost solution for reducing emissions (Lomborg 2013). This means that the primary argument for a carbon tax - efficiency - quite likely would not hold in the long run. When asked to produce a system that guarantees the Paris Climate Accord goals, economists reflexively focused on relative prices while ignoring the likely but unpredictable pace of technological change. The most important role of government in reducing GHG emissions may be supporting technological research, not enforcing regulations or tinkering with relative prices. The ideal solution is turn carbon waste into a resource, such as producing methanol from captured carbon dioxide emissions (Mckenzie-Brown 2014).

The emphasis on carbon taxes reflects an important limitation of economics. Economists are reasonably adept at measuring the price sensitivity of energy consumption. However, over the long run, energy production and consumption have been driven by technological change. While economists have elaborate and detailed models of how prices affect energy demand, they have no reliable model of technological innovation.

The closest to a consensus in economics on what drives technological change is that “novel technologies arise by a combination of existing technologies and that (therefore) existing technologies beget further technologies... we can say that technology creates itself out of itself”

(Arthur quoted in Basalla 1988, 126). This agrees with Steven Johnson’s idea that technology is a gradual but relentless probing, which opens “the doors of the adjacent possible that are directly available to you given the specifics of the historical moment” (Johnson 2014, 253). Innovation appears to be built incrementally on what is known today, not “lightbulb” moments of transcendent inspiration. Nor is there much evidence that innovation is induced by relative prices.

Relentless innovation is why there has been a steady decline in the cost of and emissions from non-renewable energy as the source of energy has shifted from wood to coal to oil to natural gas and nuclear over time. In the words of the natural gas pioneer Robert Hefner, “As man travels down the energy path from solid wood and coal to liquid gasoline to gaseous natural gas and hydrogen, the progression is one of carbon heavy to carbon light; from complex chemical structure to simple; from toxic particulate emissions to no particulate emissions; and finally, from high CO2 emissions to no CO2 emissions” (Quoted in Gilder 2013, 152). This progression to less polluting forms of energy occurred independently over centuries without carbon taxes or government direction.

“The most important role of government in reducing GHG emissions may be supporting technological research, not enforcing regulations or tinkering with relative prices.”

## Conclusion

University of Guelph Professor Ross McKittrick has outlined the difficulty of reducing emissions in a growing society. Overall emissions are a function of the carbon intensity of our economy (GHG emissions per dollar of GDP), real income (GDP per capita), and population. While carbon pricing works by reducing emissions intensity (which has been falling since 2005), real income and population growth are raising carbon consumption. Politicians of all stripes in Canada advocate for both income and population growth, which makes it more difficult to meet emissions targets. To achieve the promised 30 percent cut in emissions by 2030 requires an average annual decline of 1.4 percent in emissions. But if economic growth and population increases total 2.6 percent a year, about their recent average, then carbon intensity would have to fall by 3.8 percent a year (McKittrick 2016). This represents a total drop of nearly 50 percent in carbon intensity, not the 30 percent drop most associate with achieving the Paris Accord targets for 2030. Halving emissions intensity in such a short period is unrealistic.

Our civilization is built on energy, mostly from fossil fuels, which required enormous investments in infrastructure. Re-tooling that infrastructure is inevitably going to be a costly and slow process; Yergin estimates it takes 12 years to turn over the auto fleet, at least 50 years to retro-fit buildings, and even longer to reconfigure power plants (Yergin 2011, 631, 715). Without revolutionary technological changes, making such advancements on this scale would require taxes so high that economic growth would be impaired significantly. Carbon tax proponents argue that price hikes are an insurance policy against possible catastrophic climate change. However, the prospect of game-changing emissions technologies means that the premium on this insurance may be unnecessarily high.

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# Endnotes

- 1 The Boston Tea Party was a revolt against a tax designed to make British tea cheaper and more competitive in the American market. (See Srinivasan 2017, 38.)
- 2 Reneging on this promise was so serious for Deputy Prime Minister Sheila Copps that she vacated her seat and ran again to make sure her constituents approved of breaking this promise.
- 3 These numbers are from the OECD Tax Policy Centre.
- 4 See for example Chernick and Reschovsky 2000. The carbon tax in BC was associated with an increase in unemployment rates among medium- and low-educated males of 1.4 and 2.4 percentage points respectively (cited in Harper 2018, 191).
- 5 Almost all programs requiring federal-provincial cooperation are difficult because Canada is so decentralized. This is evident for programs ranging from infrastructure investment to housing policy, immigration, and the legalization of cannabis. Provinces such as Manitoba argue that it is better to establish federal standards without dictating how the provinces achieve them, as is theoretically the case for health care.
- 6 Another difference is methodology; Rivers and Schaufele (2012) use a panel that highlighted inter-provincial differences to address the problem of a short time period. But as Bernard and Kichian note, during this period there were few interprovincial differences in carbon pricing but substantial differences in industry production by province, so they use a time series strategy that employed data for a longer time span.
- 7 For example, see Deemer, Bridget et al. 2016. “Greenhouse Gas Emissions from Reservoir Water Surfaces: A New Global Synthesis.” *BioScience*, Vol. 66, No 11, November 1. The federal government attaches enough importance to trees that it stepped in to fully restore a \$15 million tree planting program cut by the Ford government in Ontario.
- 8 For a more detailed description of the two systems of pricing carbon, see Joel Wood. 2018. *The Pros and Cons of Carbon Taxes and Cap-and-Trade Systems*. University of Calgary, School of Public Policy Briefing Papers, Vol. 11:30, November.



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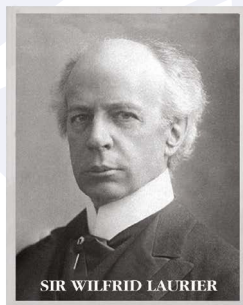
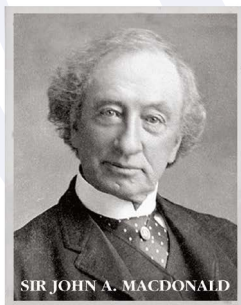
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