

**Sustainable Prosperity** is a national research and policy network, based at the University of Ottawa. SP focuses on market-based approaches to build a stronger, greener, more competitive economy. It brings together business, policy and academic leaders to help innovative ideas inform policy development.

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# Bringing Canada Back in Line

## How a Carbon Price Can Help Reduce Canada's Emissions

It is now widely accepted that greenhouse gas emissions are causing climate change and a rise in average global temperatures. In 2013, the Intergovernmental Panel on Climate Change released the latest scientific assessment of climate change in which it found that “continued emissions of greenhouse gases (GHGs) will cause further warming and changes in all components of the climate system.”<sup>1</sup>

In Canada, local, provincial and territorial governments are taking action to reduce GHG emissions. Federally, the Government of Canada is committed to addressing climate change and GHG emissions “through sustained action to build a low-carbon economy that includes reaching a post-2020 global climate change agreement, working with our North American partners and taking action domestically.”<sup>2</sup>

At the same time, our efforts to reduce greenhouse gas emissions still leave a large gap between what we have been able to achieve and what we have committed internationally to doing. As Table 1 shows, a large

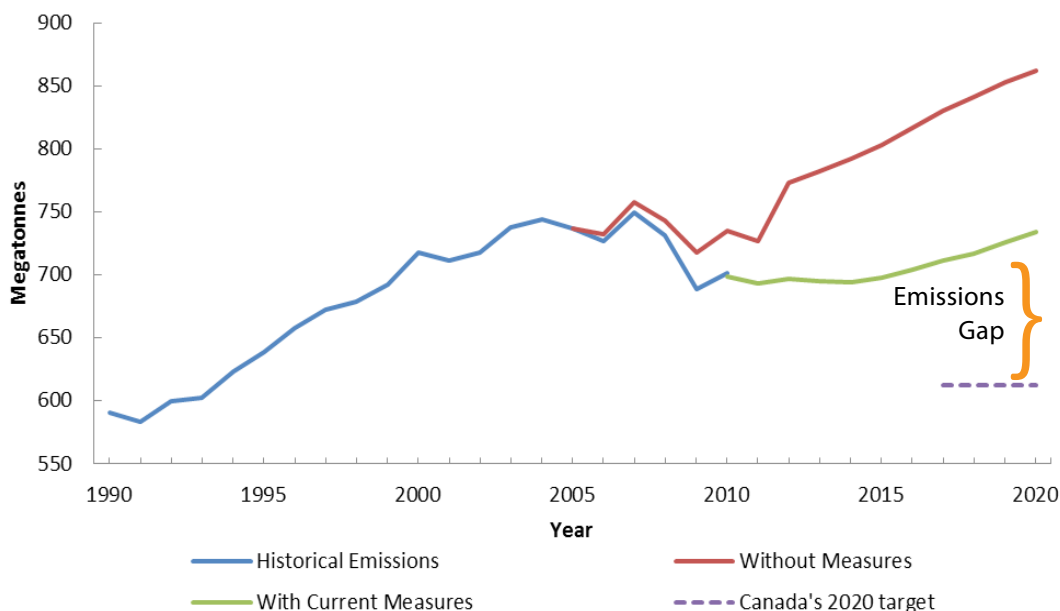
– and growing – gap exists between Canadian ambition and performance on climate change.

Greenhouse gases are often measured in terms of their carbon dioxide equivalent. In 2011, Canada's total GHG emissions were estimated to be 702 megatonnes (Mt) carbon dioxide equivalent, an increase of approximately 1 Mt (0.14%) from the 2010 level of 701 Mt. Under the Copenhagen Accord, the Government of Canada has committed to reducing Canada's GHG emissions to 17% below the 2005 level by the year 2020. From 2005-2011, Canadian GHG emissions decreased by 36 Mt (4.8%), but are projected to be 20% above the 2020 target unless further action is taken.

To fill that gap, Canadian governments will need to redouble efforts to reduce emissions in our domestic economy. That will mean bringing to bear all possible policy and market tools.

There are a several policy options that can be used to tackle the challenge of reducing GHG emissions,

**TABLE 1: CANADA'S GHG EMISSION GAP**



Source: Environment Canada, National Inventory Report, 1990-2011: Greenhouse Gas Sources and Sinks in Canada, 2013, available at <http://www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=68EE206C-1&offset=1&toc=show>

including subsidies, voluntary programs, traditional regulation, cap-and-trade emissions trading systems and taxation.<sup>3</sup> There is a role for all of these policy tools to be used in Canada; however, given the size of the challenge in reducing GHG emissions, policies that place a price on GHG emissions will be critical to ensuring Canada transitions to a low-carbon economy. In other words, **pricing carbon emissions is a necessary, but not sufficient, condition to addressing climate change.** Such instruments, as the Sustainable Prosperity research summarized in this note shows, have proven among the most effective and efficient of instruments in addressing climate change.

A **carbon price** refers to putting a price on GHG emissions by using a tax or emissions trading system (ETS). Ideally, the level of the carbon price should match the cost of the environmental damage caused by the emission. Ultimately, the goal of a carbon price is to reduce carbon emissions in order to slow the rate of climate change.

Emissions trading systems and carbon taxation both work by setting a price for GHG emissions, though the details of how they do so differ. Putting a cost on emissions creates an incentive for emitters to reduce their emissions and implement or discover technologies that emit lower levels of emissions. Compared to traditional regulatory approaches or incentive programs, carbon pricing can offer increased flexibility for compliance, lower-cost compliance, and greater cost certainty.

This Issue Summary brings together the body of evidence and analysis Sustainable Prosperity has developed on carbon pricing, to answer some of the key questions about how a carbon price could work, such as:

- What's the difference between a carbon tax and carbon emissions trading system?
- Can other policies create a carbon price?
- What is Canada's experience with carbon pricing?
- What is the international experience with carbon pricing?
- Does a carbon price lead to greenhouse gas emissions reductions?
- How will a carbon price impact consumers, and will it be fair?
- How will a carbon price impact Canadian firms' competitiveness?
- What do carbon-emitting industries think about a carbon price?

This summary of our findings shows that carbon pricing is no longer an unknown – real-world experience, economic analysis and insider opinions show that now is the time to price carbon.

## What's the difference between a carbon tax and carbon emissions trading system?

A carbon tax and a carbon emissions trading system (ETS) are both ways to limit carbon emissions by placing a cost on each unit of GHGs released to the atmosphere. In the case of the carbon tax, firms that emit GHGs pay a tax per unit of emissions, which places a cost on emissions and thus provides an incentive for firms to decrease emissions. Under an ETS, the government sets a limit (i.e., a cap) on the level of emissions for the part of the economy covered by the system and then allocates emissions permits (sometimes called allowances) equal to the total cap by selling them or giving them away to individual firms. Firms requiring more credits may purchase them from other firms that require fewer credits than their allocation, and the system may include giving firms access to other credits that are created when firms or others outside the ETS reduce emissions (these are often called offset credits.)

In both cases, the bottom line is that emitting GHGs has a price. However, the ETS may be seen as preferred by some policy-makers and firms because it allows firms the flexibility of trading. And while the price may be allowed to fluctuate in the ETS based on supply and demand for credits and offsets, the level of emissions is set with certainty at the level of the cap. Alternately, some firms and policy-makers may prefer the tax approach because it may be administratively easier to implement and the price is generally set with certainty for a given time period (though the resulting level of emissions can vary.)

## Can other policies create a carbon price?

While carbon taxes and carbon emissions trading systems are policies that explicitly place a cost on GHG emissions, other policies can be seen to place an implicit price on GHG emissions. For instance, taxes on energy, technology standards, regulatory restrictions on output and other regulations implicitly price GHG emissions. Though there has been little analysis of these implicit prices in Canada, a recent OECD report examines climate change policies in use in other countries and finds that their use and implicit carbon price value varies greatly.<sup>4</sup> Within Canada, Ontario's phase-out of coal-fired electricity generation could be seen as placing an implicit price on GHG emissions. Similarly, the federal regulations on coal-fired electricity could be seen as implicitly pricing carbon.

## What is Canada's experience with carbon prices to date?

Even though nationally Canada does not have a carbon price, there are examples in Canada of carbon pricing at the provincial level:

- British Columbia introduced a carbon tax in 2008. Initially set at \$10/tonne, it has increased over time to \$30/tonne. Initial reviews of the carbon tax have found that the carbon tax has been effective

– fossil fuel consumption is down, as are GHG emissions – and BC’s economy has kept pace with that of the rest of Canada.<sup>5</sup>

- Alberta’s Specified Gas Emitters Regulation (SGER) is in effect a carbon price. Intensity targets are set for different industries but those emitters who are not able to reach their regulated targets through their own actions can buy credits from other facilities in the system, can buy offset credits or can make payments into a technology fund at \$15/tonne.
- Quebec has a cap-and-trade system linked with that of California. The system allocated some credits for free initially, but will be relying increasingly on auction of permits over time. The first auction, held in December 2013, saw a permit price of \$10.75/tonne.<sup>6</sup>

As these policies show, the provinces have been the most active in moving forward with carbon pricing in Canada, and they are expected to be the main source of additional innovation in the near future.<sup>7</sup>

## What is the international experience with carbon pricing?

There is a growing body of experience with carbon pricing systems. Carbon pricing systems have been or are in use in various jurisdictions outside of Canada. Carbon taxes are in use in Denmark, Finland, Ireland, Norway, South Africa, Sweden, Switzerland, and the United Kingdom. Australia formerly had a carbon tax. Carbon emissions trading systems operate in the European Union, the nine Regional Greenhouse Gas Initiative states (RGGI), Switzerland, Tokyo, New Zealand and California (linked to Quebec).

## Does a carbon price lead to greenhouse gas emissions reductions?

Carbon pricing policy is like any policy – it can be designed well and it can be designed poorly. Evidence suggests that well-designed carbon policy does decrease greenhouse gas emissions below what they would have been in the absence of the pricing policy.

Looking at British Columbia’s carbon tax, Sustainable Prosperity found that since the carbon tax took effect in 2008, BC’s fuel consumption has fallen by 17.4% per capita (and fallen by 18.8% relative to the rest of Canada).<sup>8</sup> Though not fully attributable to the carbon tax, BC’s GHG emissions decreased by 5.7% between 2007 and 2011.<sup>9</sup>

During the time period in which Alberta’s SGER has been in place, GHG emissions in Alberta have continued to grow and Alberta is not on track to meet its 12% reduction in emissions intensity in the regulated sectors. It is difficult to know how much higher emissions would have been in the absence of the carbon pricing policy; however, it is likely that some reductions have occurred. More importantly, the framework has been put in place for carbon pricing and there remains the possibility of future increases in the stringency of the system.

The new Quebec cap and trade system will provide an additional opportunity to assess the effectiveness of carbon pricing in Canada once it has been operational for a period of time and data are available.

## How will a carbon price impact consumers, and will it be fair?

A carbon price increases the cost of activities that emit GHGs. If those GHG emissions cannot be reduced at a low cost, there will likely be some increase in the costs of goods produced in the industries covered by the carbon price and in services that use those goods. Where the burden of those price increases falls (in terms of industries, regions, socio-economic groups, etc.) matters.

A concern often expressed about carbon taxes is that they tend to hit hardest the income groups that spend a bigger proportion of their income on electricity and fuel (which is referred to as a “regressive” tax). This tends to be people in lower-income groups, who also happen to also have fewer options when it comes to reducing their use of electricity and fuel. New research shows that in some scenarios, carbon taxes can impact higher-income consumers more than lower-income consumers.<sup>10</sup> However, the potential for carbon taxes to be regressive is something policy-makers need to pay close attention to, particularly given the large and widening gap between the wealthy and the poor.

Both carbon taxes and ETSs have the potential to be designed fairly if potentially unfair impacts are considered from the outset. Both types of carbon price can raise revenue (through taxes or the sale of allowances) and these funds can be used to help balance any negative impacts on particular groups. British Columbia’s *Carbon Tax Act* requires that revenue generated by the tax be used to reduce other taxes and to fund a tax credit system, making it a revenue-neutral system. Quebec’s revenue resulting from the auction of allowances is used to fund new and existing climate change measures. See Sustainable Prosperity’s 2011 Policy Brief “[Carbon Pricing and Fairness](#)”<sup>11</sup> which includes an analytical framework for measuring the fairness of carbon pricing schemes (based on the BC tax) and suggestions for how policy-makers can design carbon pricing such that fairness is considered and addressed from the outset.

## How will a carbon price impact Canadian firms’ competitiveness?

The question of how a carbon price could impact the competitiveness of Canada’s industries has frequently been cited as a reason not to price carbon out of fear that energy-intensive and trade exposed (EITE) companies will lose market share to companies located in regions without comparable policies in place, or that these companies will relocate outside of Canada. In January 2013, Sustainable Prosperity explored this question in depth in “[Carbon Exposed or Carbon Advantaged?: Thinking about competitiveness in carbon-constrained](#)”

markets”,<sup>12</sup> by focusing on the example of Ontario. Ontario does not currently have a carbon price, but has an ongoing commitment to mitigating climate change. SP’s analysis found that to see the full impacts of a carbon price, the impacts on emission-intensive and trade-exposed industries must be considered along with the impacts on other sectors. Using the example of a \$40 carbon price in 2030, it was found that some sectors would likely be at an advantage under a carbon price, while others could be disadvantaged, relative to neighbouring jurisdictions. Looking at both the positive and adverse impacts from the outset allows both risks and opportunities to be identified and addressed.

More broadly, Sustainable Prosperity addressed this concern in 2011 in the Policy Brief “[The Competitiveness of a Trading Nation: Carbon Leakage and Canadian Climate Policy](#)”.<sup>13</sup> While negative competitiveness impacts are a concern, they must be put in perspective. The sectors truly vulnerable to competitiveness pressures from a Canadian carbon pricing policy represent a small percentage of Canadian GDP. Policy makers must pay careful attention to how vulnerable sectors are identified and design appropriate policy measures to protect those that legitimately require it while still achieving environmental goals. It is necessary to address domestic EITE sectors’ concerns; however, at the same time these sectors are the ones that most need to decarbonise their production processes. A carbon pricing policy compels these sectors to begin this transition and encourages short- and long-term investments in cleaner technologies and innovative processes. While protecting them may be desirable, the incentive to decrease their carbon intensity must be preserved. The long-term transition to lower carbon intensity is the ultimate strategy for ensuring that Canada’s economy remains competitive in a carbon-constrained world.

There is also evidence that carbon pricing can lead to a more innovative and competitive economy. In a 2010 analysis undertaken by Roger Martin and Alison Kemper for SP titled “[Carbon Pricing, Innovation, and Productivity: Implications for Canadian policy makers](#)”,<sup>14</sup> examination of the theory and evidence on innovation and carbon pricing found that there can be a positive relationship between carbon pricing and innovation. That innovation, in turn, has in some cases led to increases in productivity.

## What do carbon-emitting industries think about a carbon price?

Sustainable Prosperity’s 2011 Policy Brief “[Canadian Business Preference on Carbon Pricing](#)”<sup>15</sup> reported that the majority of energy and carbon intensive industries in Canada overwhelmingly support a price on carbon. The majority of firms surveyed supported a cap-and-trade program, but several supported a carbon tax. Companies are becoming increasingly vocal in their support for carbon pricing. In September 2012, President of Royal Dutch Shell Canadian Division, Lorraine Mitchelmore, said Canada “will need a carbon price”.<sup>16</sup> In 2013, Andrew Goffart, President of Total’s Canadian unit said a carbon

tax “is one of the ways to promote better performance of the industry.”<sup>17</sup>

In fact, many companies in Canada across a variety of sectors are already voluntarily building a notional carbon price into their internal corporate financial analysis and decision-making processes. Called a “carbon shadow price”, this allows companies to better understand and prepare for the risks and opportunities of a future scenario in which a carbon price is expected. In 2013, [Sustainable Prosperity surveyed ten companies operating in Canada](#) and found all ten had some experience with shadow carbon pricing, either formally or informally.<sup>18</sup> A review of literature suggests that using shadow carbon prices has become an industry standard for the oil and gas sector.

The evidence shows that Canadian firms are open to a carbon price and are already planning for a future in which carbon is priced.

## What’s next?

The Government of Canada has committed to a reduction of 17% below 2005 emissions levels by 2020 and has announced that federal regulations on oil and gas sector GHG emissions are forthcoming, though no details are yet available. Some provinces have implemented carbon pricing, as noted above. Even with those policies, though, the federal government’s own analysis shows that Canada faces an emissions gap going forward. Filling that gap is a challenging undertaking, and will require new policies. SP believes that on the strength of the evidence summarized here carbon pricing policies have an important contribution to make, and should be considered as part of these new policies.

In the absence of a carbon price, firms are already addressing the uncertainty by including a carbon shadow price in their analysis and decision-making. The evidence shows that Canadian governments should be formalizing this now by implementing a carbon price. The price could be set fairly low initially, with flexibility mechanisms like trading and a clear plan to increase the price over time.

There will be impacts from a carbon price felt by firms and individuals, but properly designed carbon pricing policies can address these where desirable. However, the ultimate point of a carbon price is to have an impact – setting a price changes our behaviour, which is necessary if we want Canadian firms, organizations and individuals to transition to a low-carbon future.

## The Bottom Line

Theory and practice show that pricing is an effective and efficient tool for mitigating climate change. Various impacts of carbon pricing can – as with all policy – arise but addressing these impacts is possible through intelligent policy design and complimentary measures.

But if we are serious about filling our emissions gap, carbon pricing needs to be part of the discussion. Without it, the gap is likely to grow.

## Endnotes

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