A Carbon Tax vs Cap-and-Trade

Policy Brief
Economic Policy Series – December 2008

Introduction

There is general agreement in the international scientific community that reducing the buildup of greenhouse gas (GHGs) emissions in the atmosphere is fundamental to mitigating climate change. As the 2012 expiration date of the Kyoto Protocol draws near, formal negotiations on a successor agreement have started under the auspices of the United Nations Framework Convention on Climate Change and its Kyoto Protocol.

Canada is fully committed to advancing the international effort to address climate change. Total GHG emissions in Canada increased from 596 million tonnes in 1990 to 747 million tonnes in 2005 (the last year for which figures are available) – a 25.3 percent increase. Carbon dioxide (CO_2) is by far the most common GHG emitted (accounting for 78 percent of greenhouse gas emissions in Canada), followed by methane (15 percent) and nitrous oxide (six percent). In 2005, Canada's carbon intensity – the amount of CO_2 emitted per unit of economic output (GDP) – was among the

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We hope this analysis will raise public understanding and help decision-makers make informed choices. The papers are designed not to recommend specific policy solutions, but to stimulate public discussion and debate about the nation's challenges.

highest in the OECD (see Figure 1). Canada is also among the top ten OECD countries in terms of per capita emissions of CO_2 (see Figure 2).[1]

Canada has traditionally used a regulatory approach to achieve environmental objectives. This approach favours the use of emissions standards or technology-based standards. At the heart of the current debate are two alternative, market-based (price) mechanisms – a 'carbon tax' and 'cap-and-trade' system. This paper analyzes each from an economic policy perspective. It does not analyze any specific proposals put forward by political parties.

The paper concludes that market-based mechanisms achieve environmental goals in a more efficient and effective manner than traditional regulation. The reason: they create incentives for emissions reductions – by making it more costly to emit GHGs and air pollutants, they discourage the burning of fossil fuels (like coal, oil, and natural gas) and encourage use and development of clean, renewable energy (like wind, solar and geothermal power). Consumers and producers have a greater incentive to use energy more efficiently.

With a carbon tax, the government establishes a direct price on carbon emissions and allows the market to determine the resulting quantity of emissions.[2] A carbon tax has the advantage of providing predictable long-term pricing and; therefore, greater certainty regarding costs, making business planning and decision-making easier (price certainty is a better driver for innovation and investment than price uncertainty). A carbon tax can be implemented quickly utilizing the existing tax collection and administrative infrastructure. However, there is uncertainty about the quantity of total emissions.

With a cap-and-trade system, the government establishes a target quantity of emissions and issues tradable permits to firms (the total of which matches the target) allowing the market to determine the price for permits. This approach is more politically attractive (it's not a new tax); however, price uncertainty can make business planning difficult. Prices for emissions permits can be unstable and unpredictable. Transaction costs are higher compared to a carbon tax reflecting the need to develop and put in place a new institutional infrastructure, including an extensive tracking/administrative system, along with rigorous and consistent penalties for enforcement of fraud or noncompliance.

Revenues generated from a carbon tax or a cap-and-trade system (if emissions permits are initially auctioned by government and not distributed free of charge) should be returned to taxpayers through reductions in personal and corporate income taxes. This revenue-neutral policy would shift taxation away from work, savings, investment and corporate earnings toward environmentally harmful activities. It would enhance the overall efficiency of Canada's tax system. Moreover, it would help ensure that Canada remains competitive in the absence of similar climate change initiatives in other countries.

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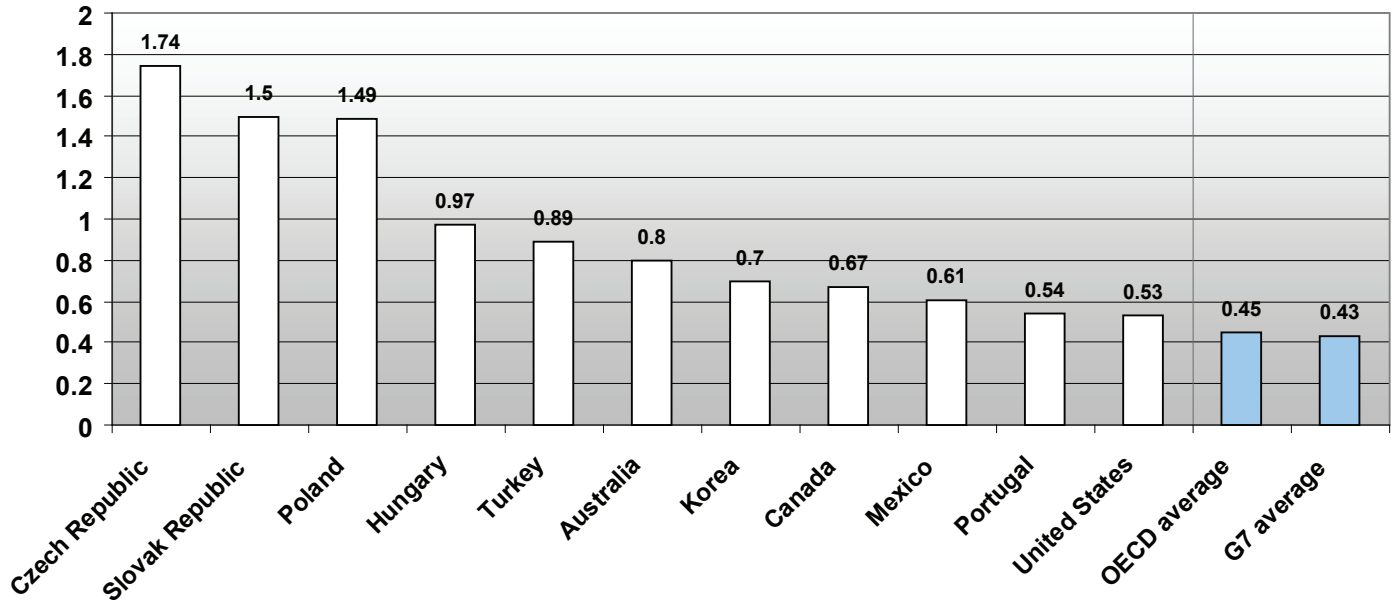
1 Playing a role are the large size of the country, low population density, high energy demand imposed by the climate, a resource-based economy, and the high volume of goods exported. (Source: Statistics Canada. 2008. Catalogue no. 16-201-X. April).

2 Since carbon dioxide (CO_2) is the most abundant GHG, reducing carbon emissions is a central objective.

Figure 1

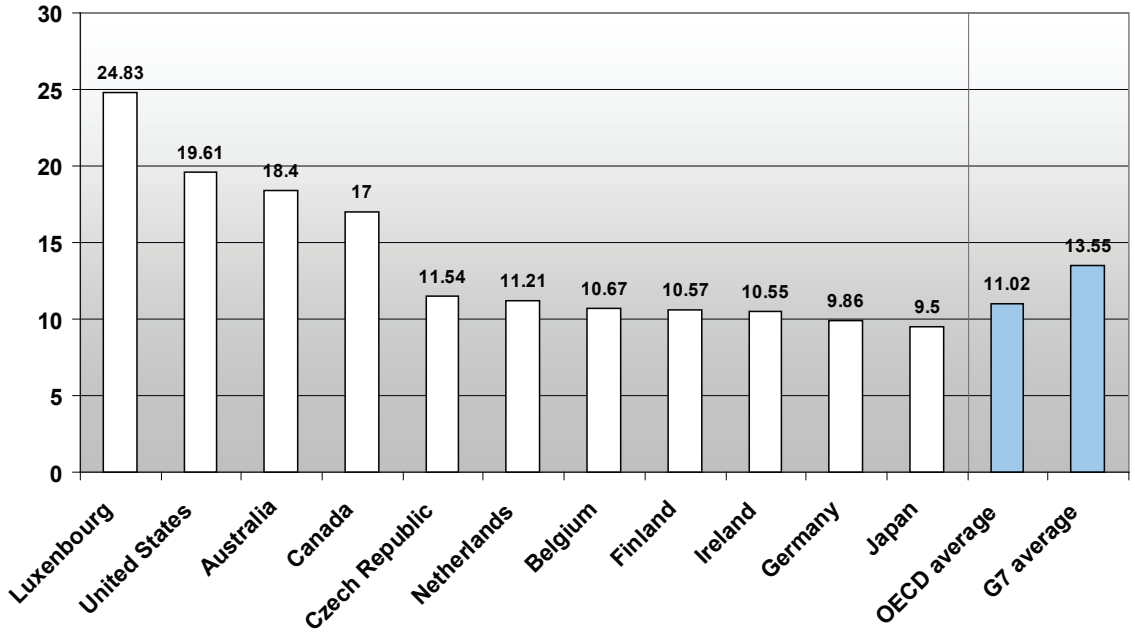
CO_2 Emissions from Fuel Combustion per Unit of GDP
(kg per 2000 USD)



Source: OECD. OECD in Figures, 2007 Edition; Canadian Chamber of Commerce

Figure 2

CO_2 Emissions from Fuel Combustion per Capita
(tonnes per capita)



Source: OECD. OECD in Figures, 2007 Edition; Canadian Chamber of Commerce

Setting the Stage: Environmental Economics 101

The economy and the environment are inextricably linked. Environmental resources – land, air and water – are integral to economic development and the well-being of Canadians. When environmental resources are degraded, greater effort and resources must be devoted to cleaning up the environment to preserve health and quality of life, instead of producing goods and services Canadians value. Canadian living standards and the productivity of our economy are undermined.

Canada has traditionally used a regulatory approach to achieve environmental objectives. This is often referred to as 'command-and-control'.

Market-based instruments have now moved center stage. Market-based instruments encourage a change in behaviour through pricing signals rather than through explicit directives. They attach an explicit cost to emitting pollutants or to undertaking activities with adverse environmental impacts. Market-based instruments include environmental taxes, user charges and fees, tax incentives and disincentives, and markets for tradable emissions permits. In many circumstances, market-based instruments are more cost-effective and introduce fewer distortions in the economy than traditional regulation.

Environmentally Related Taxes

Environmentally related taxes are not new. They were first proposed some 90 years ago. Revenues from environmentally related taxes comprise about three percent of GDP across OECD countries and only about one percent in Canada.[3]

Environmentally related taxes are based on the 'user pays principle' – i.e. the costs of pollution should be borne by those who cause it. It is a generally recognized principle of International Environmental Law, and it is a fundamental principle of environmental policy of both the Organisation for Economic Co-operation and Development (OECD) and the European Community.

These taxes can be effective and efficient instruments to achieve environmental policy objectives because they ensure that producers and consumers take into consideration the costs of polluting. Many environmentally related taxes contribute to environmental improvements by causing price increases that reduce demand for environmentally harmful products. Environmental taxes can also have the effect of stimulating innovation and technological change in a way that is not achieved by regulations.

3 Source: European Environment Agency. Environmental taxes include excise taxes on pollution-intensive goods such as fuels, pesticides, batteries, paints and tires.

Carbon Tax

Earlier this year, the National Round Table on the Economy and the Environment (an independent federal agency) concluded "Canada can achieve deep greenhouse gas (GHG) emission reductions by 2050, but only by putting a price on carbon emissions throughout the entire Canadian economy beginning as soon as possible."[4]

A carbon tax is an excise tax based on the carbon content of fossil fuels (like coal, oil, natural gas). It is based on the 'user pays principle'. By putting a direct price on carbon emissions, it provides strong incentives for businesses and individuals to adjust their behaviour: reduce the use of carbon-emitting fossil fuels; develop and adopt more energy efficient technologies; shift to renewable energy or lower-carbon energy; capture or store carbon; or drive less, for example. This approach also shifts the focus of policy makers and legislators from the ineffable task of regulating.

The existing federal fuel excise tax (which raises about $5 billion annually) was not designed with environment objectives in mind. It was designed to raise revenue and reduce Canada's dependence on oil. It is an inefficient and unfair tax because it is levied on only one category of product – motive fuels, like gasoline, diesel fuel and aviation fuel. Moreover, each of these fuels is taxed differently creating an uneven playing field.[5] Other transportation fuels – like compressed natural gas and propane – are exempt from the tax. Other sources of energy that release emissions – such as the use of coal to generate electricity – are not taxed.

An opportunity exists to restructure the federal fuel excise tax so that it more closely corresponds to the 'user pays principle'. This would entail broadening its base so that it includes other sources of GHGs and air pollutants and ensures that environmentally harming activities bear a more appropriate charge for the damage caused.

The federal fuel excise tax is levied on gasoline at 10 cents per litre which is equivalent to a carbon tax of approximately $42 per tonne of CO_2 on gasoline. Applying this rate to other fuels in proportion to their carbon content (at the end use when the fuel is combusted)[6] will result in higher energy prices (except for gasoline), signaling consumers and producers to reduce consumption and; therefore, emissions. "Such a tax would be more fair, in that it would apply to all fuels, not just motive fuels, and more effective in that the tax rate would be tied to the polluting impacts of a given fuel type." [7]

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4 National Round Table on the Environment and the Economy. 2008. "Getting to 2050: Canada's Transition to a Low-emission Future." January 7.

5 Gasoline is taxes at 10 cents per litre; diesel fuel and aviation fuel at 4 cents per litre.

6 Applying the tax as close as possible to point-combustion is based on the premise that the price signal should occur as close as possible to the point of consumer choice.

7 Mintz Jack and Nancy Olewiler. 2008. "A Simple Approach to Bettering the Environment and the Economy: Restructuring the Federal Fuel Excise Tax." Sustainable Prosperity. April 9.

Table 1 illustrated the tax rate ($/GJ) applicable to various fuels with a $42 per tonne of CO_2. A ten cent per litre tax on gasoline is equivalent to approximately $2.80 per GJ.

Table 1[8]

Sector	Fuel Tax Rate / GJ (at $42/tonne of CO2)
Residential	
Natural Gas	$2.10
Heating Oil	$3.00
Industrial	
Natural Gas	$2.10
Diesel	$3.00
Heavy Fuel Oil	$3.10
Petroleum Coke/Still Gas	$2.00
LPG NGL	$2.30
Coal[9]	$3.70
Coke	$3.60
Commercial	
Natural Gas	$2.10
Heavy Fuel Oil	$3.10
Light Fuel Oil	$3.00
Electricity	
Natural Gas	$2.10
Heavy Fuel Oil	$3.10
Light Fuel Oil/Diesel	$3.00
Coal	$3.70
Petroleum Coke	$3.80
Transportation	
Natural Gas	$2.10
Gasoline	$2.80
Diesel	$3.00
Heavy Fuel Oil	$3.10
Aviation Gas	$2.80
Propane	$2.50

The cost of coal would go up the most because it emits more CO_2, with the price for natural gas rising the least, a reflection of its low CO_2 content. Demand for natural gas will likely increase as users switch to it.

The carbon tax will disproportionately impact energy- and emissions-intensive sectors, particularly electricity generation, manufacturing (especially, iron & steel, chemicals, pulp & paper, aluminum and cement) and transportation (see Table 2). There will be significant variation in firm-level impacts within an industry.

There may be a temptation to exempt certain sectors from the carbon tax but this only introduces distortions in the economy. Sectors should bear similar tax treatment to encourage the best allocation and profitable use of resources in the economy.

8 Ibid.

9 Average rate based on bituminous and lignite coal from domestic and imported sources.

Table 2[10]
Canada's CO_2 Emissions by Sector
(Million tonnes of CO_2 - 2005)

Total	583.0
Energy	**544.0**
Stationary Combustion Sources	338.0
Electricity and heat generation	128.0
Fossil fuel industries	70.4
Petroleum refining & upgrading	18.0
Fossil fuel production	52.0
Mining and oil & gas extraction	15.5
Manufacturing	45.4
Iron & Steel	6.5
Non-Ferrous Metals	3.2
Chemicals	5.3
Pulp & Paper	7.0
Cement	4.6
Other Manufacturing	18.8
Construction	1.3
Commercial & Industrial	36.6
Residential	39.5
Agriculture & Forestry	1.9
Transportation	**190.0**
Domestic Aviation	8.4
Road Transportation	131.0
Railways	5.6
Domestic Marine	6.1
Other[11]	38.0
Fugitive Sources[12]	**16.0**
Industrial processes	**39.0**
Mineral Products[13]	9.5
Chemical Industry[14]	5.0
Metal Production[15]	11.09
Other and Undifferentiated Production	13.0
Land Use, Land-use Change, and Forestry	**-26.0**

A carbon tax will impact regions of the country differently. See Figure 3. For example, parts of the country that rely mostly on coal as a feedstock for electricity generation (like Alberta, Saskatchewan and Nova Scotia) will be more affected than regions that depend primarily on hydropower (like Quebec, Manitoba and B.C) when the price of coal rises.

10 Source: Environment Canada. 2007. "National Inventory Report: Greenhouse Gas Sources and Sinks in Canada, 1990-2005". Greenhouse Gas Division. Ottawa.

11 Off-road; pipelines.

12 Examples of fugitive GHG emissions related to fossil fuels include intentional flaring of natural gases at oil and gas production facilities, leakage from natural gas transmission lines and processing plants, accidental release from oil and gas wells, and releases from the mining and handling of coal.

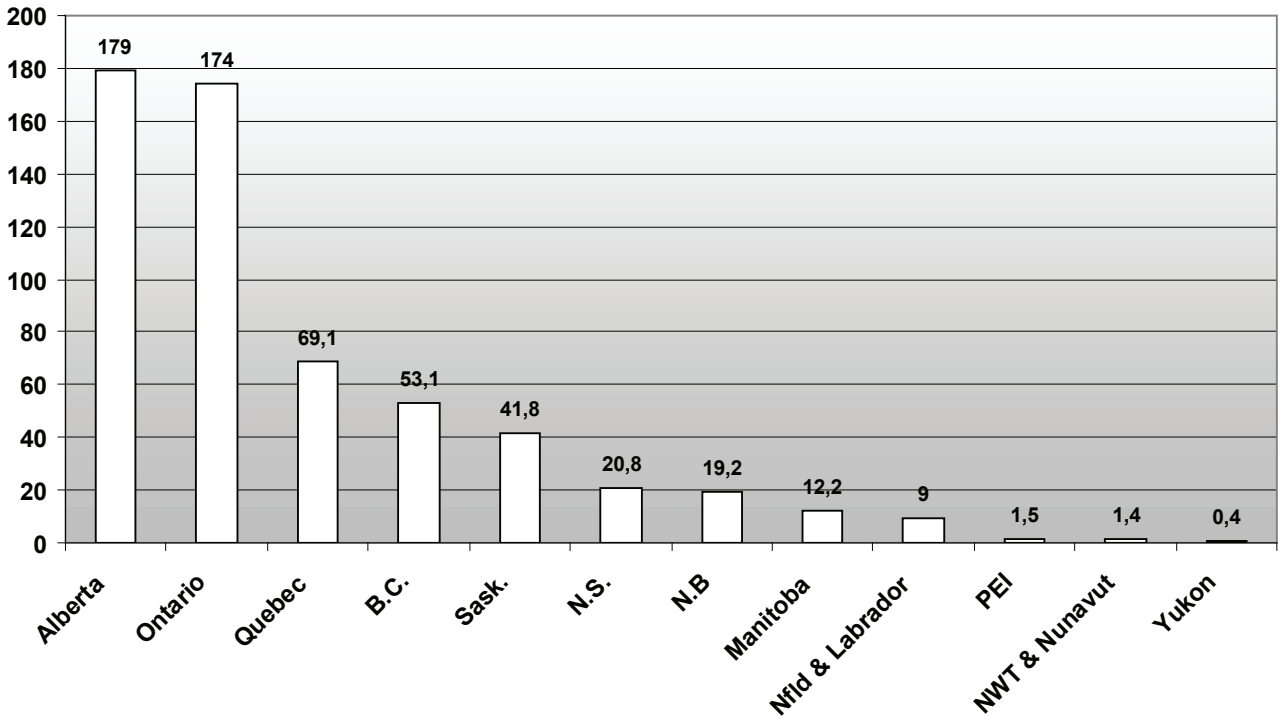
13 Cement production, lime production, and mineral product use.

14 Ammonia production, nitric acid production, and adipic acid production.

15 Iron and steel production, and aluminum production.

Figure 3

CO_2 Emissions by Province/Territory
(million tonnes)



Source: Environment Canada. National Inventory Report: Greenhouse Gas Sources and Sinks in Canada; Canadian Chamber of Commerce

Immediately raising all fuel excise taxes to the current rate of the gasoline tax is one approach. A preferred option is to phase in the carbon tax over several years so prices gradually rise, allowing consumers and businesses time to adjust.

In time, the restructured fuel excise tax (i.e. carbon tax) can be expanded to include non-combustion emissions from the cement and aluminum industries, fugitive gases, and landfill. The restructured fuel excise tax could also be broadened to include other health-affecting air contaminants like sulphur dioxide (SO_2) and nitrogen oxides (NO_x)

By taxing previously untaxed fuels, the restructured fuel excise tax (i.e carbon tax) will raise approximately $20 billion annually in the short-run,[16] adding $15 billion to existing federal fuel excise taxes. The federal government collected approximately $148 billion in corporate and personal income taxes in fiscal 2006-07. A carbon tax would allow the federal government to reduce personal and corporate income taxes by 10 percent – not an insignificant amount. Carbon tax revenue used to cut personal income tax rates, would help offset increased costs for individuals. Similarly, reducing corporate income tax rates, enhancing capital cost allowance rates, and providing tax credits for environmental technologies would ease the burden facing adversely-affected sectors. Carbon tax revenue should not be used for expenditure programs.

For low-income earners who pay little or no income tax, a refundable tax credit (similar to the quarterly GST credit) should be provided to

16 A carbon tax would raise less money in future years as greater reductions in carbon emissions occur through improvements in efficiency, fuel switching, or new technologies.

ensure these individuals receive direct compensation to offset the additional costs associated with a carbon tax.

Shifting the focus from income taxes to consumption taxes (like a carbon tax) would improve the efficiency of the overall tax system. Reducing personal income taxes would encourage people to increase work effort, save, invest, and upgrade their skills, and entrepreneurs to take risk and fund capital investments. Reducing corporate income taxes would encourage businesses to invest and create jobs. Overall, it would enhance competitiveness, productivity, living standards and protect our natural environment.

"A tax on an environmental externality not only helps curb the externality, but also provides revenue with which other distorting taxes can be reduced, thereby providing efficiency gains." This would be desirable "even if the environmental benefit of reduced carbon emissions failed to be realized." [17]

In summary, a carbon tax has many benefits from an environmental policy and economic policy perspective: It is based on the 'user pays principle'; it incorporates a negative externality into fuel prices; over time, it can result in reduced demand for carbon-based fuels and substitution toward cleaner fuels; it promotes energy efficiency; encourages development and deployment of low- or non-emitting technologies; it results in a level playing field because it applies to all fuels; and it provides predictable pricing making business planning and decision-making easier. It also provides an opportunity to reform Canada's tax system in a way that promotes productivity and economic growth.

It is important to acknowledge that a carbon tax can put Canadian-produced carbon-intensive goods at a competitive disadvantage with other countries that do not price carbon. It would not especially disadvantage Canada relative to Europe where many countries levy a carbon tax.[18] Canada will need to offset losses in competitiveness by ensuring that the revenue generated from a carbon tax is used to reduce income taxes. Another way to maintain international competitiveness is to adjust the taxes of energy-intensive goods at the border. Border tax adjustments (BTAs) consist of imposing carbon taxes on imports at the domestic rate in order to maintain competitiveness domestically, while relieving exports of carbon taxation allowing them to compete untaxed in international markets. However, because BTAs serve as barriers to trade, they also present a potential conflict with the rules of the World Trade Organization (WTO). A way to resolve the conflict between carbon taxes and WTO rules may be to reform the rules themselves. The WTO has recognized "the importance of further work on the extent to which WTO rules need to be reviewed to accommodate environmental taxes and charges."[19]

The Business and Industry Advisory Committee to the OECD (BIAC) has warned "about the huge risks of trade conflicts that could be triggered

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17 Green, Kenneth P., Steven F. Hayward, and Kevin A. Hassett. 2007. "Climate Change: Caps vs Taxes." American Enterprise Institute for Public Policy Research. June. A negative externality is an activity taken by an individual or firm where the costs to society exceed the private cost.

18 Like Denmark, Sweden, Norway, Finland, Italy, the Netherlands, and the United Kingdom. Germany, Austria, and Belgium have adopted broader energy taxes.

19 World Trade Organization. 2004. "Trade and the Environment at the WTO." April.

by border tax adjustments." "BIAC encourages the OECD to voice strong concerns about such approaches, which are extremely complex, difficult to implement, and could trigger retaliation measures with negative consequences for trade liberalisation efforts."[20]

It is also important to address the concern that a carbon tax is detrimental to economic growth. Recent research shows that "Canada's economy is expected to grow to a GDP of $1.79 trillion per year by 2020. The introduction of a carbon price is projected to slightly reduce the rate of GDP growth by 2020 to $1.76 trillion – a difference of 1.9 percent." "If the revenue that government collects from carbon pricing is properly reintroduced into the Canadian economy, the projected decline in the rate of economic growth can be substantially reduced, to 0.9 percent." [21]

20 BIAC. 2008. "Economics of climate change addressed at OECD Council Ministerial in June." June.

21 M.K. Jaccard and Associates, and Enviroeconomics. 2008. "Pricing Carbon: Saving Green. A Carbon Price to Lower Emissions, Taxes and Barriers to Green Technology." February.

Provinces Lead the Way on Carbon Taxes

In October 2007, **Quebec** became the first province to implement a carbon tax: 0.8 cents per litre on gasoline; 0.9 cents on diesel fuel; 0.96 cents on light heating oil; 1.0 cent on heavy heating oil; 1.3 cents on coke used in steel making; 0.5 cents on propane; and $8 per ton on coal. The province expects to raise about $200 million a year to finance the Province's green plan (for example, new programs to replace industrial and institutional hot-air generators and cooling systems; funds to allow municipalities to evaluate their greenhouse gas emissions and develop local plans; and funds for R&D in new techniques to store CO_2).

On July 1, 2008, **British Columbia** began to phase in a comprehensive carbon tax. It applies to all fossil fuels (including gasoline, diesel, jet fuel, natural gas, propane, coal and home heating fuel, which together account for 70 percent of B.C.'s greenhouse gas emissions). It starts at a rate of $10 per tonne of CO_2 emissions and will rise by $5 a year to reach $30 per tonne of CO_2 by 2012. This initially works out to 2.41 cents per litre for gasoline, rising to 7.24 cents by 2012. The tax is expected to generate a total of $1.85 billion over three years. To offset the cost of the carbon tax, lower-income households will initially receive an annual refundable tax credit of $100 per adult and $30 per child, rising by 5 percent in 2009 and possibly more in future years. The bottom two personal income tax rates will be reduced resulting in a tax cut of 2 percent in 2008 and 5 percent in 2009, with further reductions expected in 2010. Effective July 1, 2008, the general corporate tax rate was reduced from 12 percent to 11 percent (and 10 percent by 2011) and the small business tax rate from 4.5 percent to 3.5 percent (and 2.5 percent by 2011). One-third of carbon tax revenue will be returned to businesses and two-thirds to individuals to ensure each gets back their share of carbon taxes paid.

In its 2008 Budget, **New Brunswick** proposed a carbon tax based on the B.C. model. The tax on all forms of carbon or carbon-equivalent emissions will be phased-in gradually over several years. Once fully implemented, the government estimates that $100 million in revenue can be generated with a carbon tax to go towards reducing personal and corporate income taxes.

Emissions Trading: Cap-and-Trade System

Under a cap-and-trade system, the government sets a limit (a 'cap') on the amount of a CO_2 that can be emitted. Companies are issued emissions permits (also referred to as allowances or credits) which represent the right to emit a specific amount of CO_2. The total number of permits matches the cap (generally, one permit for every tonne of CO_2). Companies that need to increase their emissions must buy permits from those that pollute less. The transfer of permits is referred to as 'trade'.

The ability to trade permits establishes a price on emissions. This price provides firms with an incentive to reduce their emissions; use energy more efficiently; find the lowest cost method for reducing emissions; and invest in the development and deployment of low- or non-emitting technologies, thereby lowering the future cost of reducing emissions.

The largest active cap-and-trade program in the world is the European Union Emissions Trading Scheme. It regulates CO_2 emissions from the energy sector, iron and steel production and processing, the mineral industry, and the paper and board industry. The United States has a nationwide cap-and-trade system for sulfur dioxide (SO_2) emissions from electrical utilities.

In both the EU and the U.S., emissions permits were given to industry for free (at the start of the program) to obtain support for the system and encourage the rapid start-up of a market for trades. Providing permits for free allows firms who would not have been able to acquire credits in the auction to remain in business. For firms that would have been able to pay for permits at auction, or would have reduced emissions anyway, obtaining permits for free creates an extra benefit (a 'windfall' profit). Free emissions permits are valuable assets – they increase the firm's income either by increasing revenue if the permits are later sold or by decreasing costs if the permits are used. This is a key reason why industry may prefer a cap-and-trade system over carbon taxes. "Were all permits subject to auction, big industry may look much more kindly on a carbon-added tax."[22]

A national cap-and-trade system would require the creation of new administrative and legal trading infrastructure, complete with new regulations and institutions to effectively enforce the system (fines and sanctions), and a national electronic registry for issuing, holding, transferring and cancelling permits. To promote transparency and objectivity, an independent advisory panel will be needed to recommend adjustments based on new scientific evidence; assess economic impacts; and determine the effectiveness of the cap in meeting GHG emissions targets. The system should be designed with the view of harmonizing it with programs in other nations.[23] Decisions will need to be made on how to deal with permit price volatility and whether to allow for 'banking' and 'borrowing'.[24]

To be most effective, and not discriminate between industries, a cap-and-trade system should target all fossil fuel-related CO_2 emissions. The cap should be imposed upstream, i.e., on

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22 Courchene, Thomas J. 2008. "Climate Change, Competitiveness and Environmental Federalism: The Case for a Carbon Tax." Background Document for a Canada 2020 Address. June 3.

23 Harmonizing a cap-and-trade system globally has the potential for large transfers from developed to developing countries. In contrast, a carbon tax-based international agreement does not involve such a transfer. All carbon taxes would be raised and retained within individual countries.

24 Those that have surplus permits can store them for later use (referred to as 'banking'). Those with a shortage of permits can 'borrow' from a future year to fulfill the requirements of the current year. 'Banking' and 'borrowing' add flexibility to the system and can mitigate permit price fluctuations.

fossil fuels at the point of extraction, processing or distribution. The cap should start at a modest level and increase over time to lessen transition costs and allow the most affected industries, workers, communities and regions time to adjust.

Similar to a carbon tax, a cap-and-trade system will have broad economic effects because it raises the cost of fossil fuels and electric power generation. Certain sectors will be particularly affected, like fossil fuel producers, electric power plants, and energy-intensive industries (like manufacturing). The more stringent the cap, the higher the market price of permits, and the greater the impact on affected industries. The impact on regions will be similar to that noted above with a carbon tax. Ultimately, the burden will fall on households in the form of higher prices for energy and other goods and services. Lower-income households that tend to spend a larger share of their income on energy-intensive goods and services will be the most affected.

To mitigate the loss in competitiveness, it is preferable to auction permits at the start and use the revenue to reduce personal and corporate income taxes (similar to the proposal put forward above with respect to a carbon tax). This would stimulate additional economic activity, offsetting some the negative impacts of a cap-and-trade system. Without auctioning the permits, and recycling the revenue back to taxpayers (individuals and businesses), a cap-and-trade system that increases the cost of producing goods and services in proportion to their CO_2 emissions will put Canadian industry at a competitive disadvantage relative to other countries that are not taking similar action. One option is to require imports of carbon-intensive goods from countries that have not taken comparable climate policy actions to buy and hold special international emissions permits and surrender them at the border with the goods being imported. This will ensure that imported energy-intensive goods also incorporate a price for GHG emissions. It is not clear whether this complies with WTO rules.

In summary, a cap-and-trade system can achieve the same objectives as a carbon tax, especially if permits are auctioned. It is superior to traditional, command-and-control regulation. However, it is a more complicated means than a carbon tax to achieve similar environmental goals; permit prices may be unstable and unpredictable; administrative and legal costs are higher; and it is less practical at the level of individual households. If significant volatility in permit prices emerges, businesses may be required to develop hedging strategies to minimize risk.[25]

25 The nationwide cap-and-trade system for sulfur dioxide (SO_2) in the U.S. has seen significant volatility in emission permit prices, ranging from a low of US$66 per ton in 1997 to $860 per ton in 2006.

Provinces Lead the Way on Cap-and-Trade

In February 2007, **British Columbia**, **Manitoba** and seven U.S. states adopted cap-and-trade strategies under the Western Climate Initiative (WCI). **Quebec** moved from Observer to Partner status in April, 2008 and **Ontario** became a Partner in July 2008. Other U.S. and Mexican states and Canadian provinces have joined as observers. The WCI represents approximately 73 percent of Canada's economy and 20 percent of the U.S. economy. The WCI will identify, evaluate and implement ways to collectively reduce GHG emissions. Partners will set an overall regional goal to reduce emissions; develop a market-based, multi-sector mechanism to help achieve that goal; and participate in a cross-border GHG registry. This will lay the foundation for a North American cap-and-trade system.

As of July 1, 2007, **Alberta** implemented a soft (intensity-based) cap-and-trade system. Companies in the Province that emit more than 100,000 tonnes of greenhouse gases annually will have to reduce their annual emissions intensity by 12 percent. Those unable to do so may purchase emissions permits at $15 per tonne of CO_2 emitted above the target. The funds go into an Alberta-based technology fund. Alternatively, large emitters can invest an equal amount in Alberta-based projects outside their operations that reduce (or offset) emissions on their behalf.

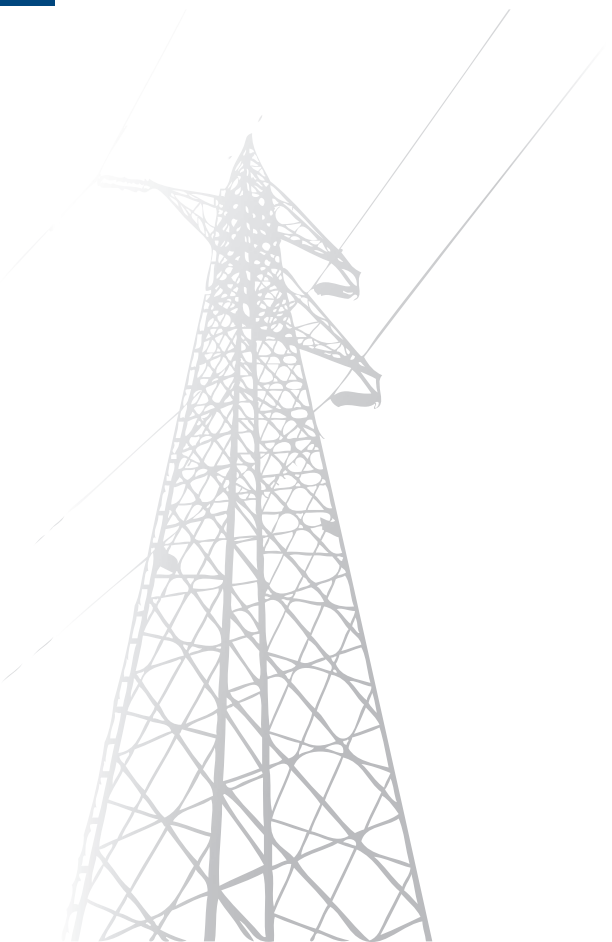
The Technology Challenge

An effective program to reduce GHG emissions ultimately depends on the speed of developing, commercializing and deploying low- and near-net zero carbon energy technologies, as well as technologies that increase end-use energy efficiency. Some advanced technologies may not be sufficiently attractive to penetrate the market place on a large scale without supporting policy or incentives. Other technologies, like those that capture or sequester CO_2, are expected to remain expensive even considering further technological progress.

In the final analysis, no single technology will meet the challenge of reducing GHG emissions. Significant investment in R&D will be required to develop a portfolio of advanced technologies. Investment in R&D can be risky because it is not known in advance if, or to what extent the new technology will be effective in reducing GHG emissions, or if it is flexible enough to meet both short- and long-term objectives.

There is also the issue of market acceptance. Significant investment will be required by industry. Moreover, widespread deployment of advanced technologies can be tricky – each technology must be integrated within a larger technical system and infrastructure, not just as a component.

Lastly, there is the issue of timing. Energy infrastructure, for example, has a long lifetime (as much as a 50 year life cycle), and change in the capital stock occurs slowly. Once new technologies are commercially available, their adoption takes time. Some technologies with low or near-net-zero GHG emissions may need to be available and moving into the marketplace decades before their maximum market penetration is achieved.



Final Thoughts

A carbon tax and cap-and-trade system complement each other, ensuring there is a price on CO_2 emissions across the entire economy (given that a cap-and-trade system typically covers large, stationary sources of emission (at the production end) while a carbon tax addresses the consumption end.

Before introducing a carbon tax and/or cap-and-trade system, the federal government must consult with provincial/territorial governments. It should work with them to harmonize environmental policies across the country to reduce economic and compliance costs arising from the multiple implementation of carbon taxes and cap-and-trade programs. This is a critical role for the federal government.

"It is intriguing that in both Canada and the US the sub-national governments are bravely and creatively carrying the policy ball for climate change, while their respective federal governments are either or both politically and ideologically unable to assume the leadership on this file". "The longer that Ottawa remains on the sidelines, the more intractable the federal-provincial and interprovincial dimensions of climate change policy will become."[26]

Lastly, we cannot underestimate the importance of the global dimension of these policies. Multilateral solutions are preferable to unilateralism.

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26 Courchene, Thomas J. 2008. "Climate Change, Competitiveness and Environmental Federalism: The Case for a Carbon Tax." Background Document for a Canada 2020 Address. June 3.