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Climate Costs in Context: The High Cost of Doing Nothing

"The costs of action, though real, are affordable, while the costs of inaction – economic, environmental and national security – are so profound that if we fail at this moment of truth, it will amount to a breach of our generational contract to leave our children a better world."

- Todd Stern, U.S. Special Envoy for Climate Change

In Canada, the debate about how to cut greenhouse gas (GHG) pollution often invokes questions of costs. Communities worry about what will happen to their industries or their jobs if the government takes tough action on global warming.

Tackling climate change means changing the way we produce and consume energy, and any change of that magnitude carries some cost. But it also creates new opportunities.

And there's a clear message from economists studying climate change: action is cheaper than the alternative.

In his 2006 review of the economics of climate change, former World Bank chief economist Sir Nicholas (now Lord) Stern estimated that the damages of uncontrolled emissions would be equivalent to losing between 5% and 20% of global GDP "now and forever," with "the appropriate estimate...likely to be in the upper part of this range."

In addition to the benefits of avoiding costly climate impacts, many measures to reduce emissions pay for themselves (or better) through reduced energy costs and lower air pollution-related expenditures. A range of authoritative assessments — including contributions from Lord Stern, the consulting firm McKinsey & Company, the International Energy Agency (IEA) and the Intergovernmental Panel on Climate Change (IPCC) — have concluded that the costs of tackling global warming are modest, ranging from less than 1% to 3% of global GDP by 2030. According to McKinsey, the upfront costs required to have a chance of containing global warming to 2°C, relative to the pre-industrial level (a limit that all major emitting countries endorsed in July 2009) would represent only 5–6% of the total investments in fixed assets that are projected to occur under "business-as-usual" conditions. The IEA estimates that these costs — US\$10.5 trillion in total between now and 2030 — would yield a benefit of US\$8.6 trillion in energy savings over the same period.

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"The claim that climate legislation will kill the economy deserves the same disdain as the claim that global warming is a hoax."

- Nobel Prize-winning economist Paul Krugman

Economic analysis also shows that successfully tackling climate change at reasonable cost requires rapid action. McKinsey estimates that each year of delay results in the construction of new carbon-intensive infrastructure that will last for an average of 14 years. The firm's 2009 report, "Pathways to a Low-Carbon Economy" also concludes that "a 10-year delay in taking abatement action would make it virtually impossible to keep global warming below two degrees Celsius."

Finally, there is also strong evidence that tackling climate change costs less if the effort is coordinated across sectors and regions. Such coordination is more likely under a strong global climate agreement.

Cap-and-Trade Q&A

Cutting pollution, cutting costs

Major economic studies — from Canada's National Roundtable on the Environment and the Economy to the Stern Review have consistently found that an economy-wide price on GHG emissions (a "carbon price") is essential to achieving emission reductions while minimizing costs. A cap-and-trade system establishes a carbon price by creating a fixed number of emission allowances, thereby capping GHG pollution from designated emitters, who are required to hold allowances covering every tonne of GHGs they produce. However, emitters are free to trade amongst themselves, buying and selling allowances to meet their needs.

What does it mean to "auction allowances"?

Auctioning is a means of distributing emission allowances in which emitters must purchase the allowances from the government rather than receiving them for free. The government can then use the auction revenue to reduce costs for households and employers, protect vulnerable industries and invest in further emission reductions and innovation. Auctioning is increasingly being recognized as the simplest and fairest way to distribute allowances. The EU's cap-and-trade system, for example, will auction 100% of allowances for the electricity sector (in the most wealthy countries) starting in 2013, and 70% of allowances in other sectors by 2020.

Is there a role for "offsets"?

Offsets are credits given for emission reductions that come from sectors outside the cap — in agriculture or forestry, for example. A cap-and-trade system may allow firms that are under the cap to buy offsets and use them for compliance in place of allowances. However, offsets present two major risks. The first is that large volumes of offsets will depress the carbon price to the point where firms no longer have much incentive to reduce their own emissions. The second risk comes from the fact that it is difficult to avoid awarding offset credits for emission reductions that would have happened anyway — thereby undermining the environmental effectiveness of the cap.

Won't a cap-and-trade system significantly increase the price of essentials, like home heating and gasoline?

In fact, initial price increases are likely to be far less than the fluctuations consumers already see in the market. And knowing emissions carry a price tag will encourage people to reduce their energy consumption at home and on the road. In the medium term, this means price increases will be compensated by dollar savings as families become more energy-efficient. Governments can also use some of the revenues raised through the auction of emission allowances to provide rebates to lower-income Canadians to ensure they face no net increase in costs.



This figure illustrates the broad range of emission reduction opportunities available worldwide at less than 60 euros (\$95) per tonne of carbon dioxide equivalent. The left-hand side of the curve shows reduction opportunities that have "negative costs" — meaning that they actually save money for businesses and individuals.

Source: McKinsey & Company

Affordable Opportunities

What effect would a carbon price have on the oil sands?

Environment Canada figures from 2008 indicate that, in a business-as-usual scenario, 95% of the projected increase in Canada's industrial emissions by 2020 would come from Alberta's oil sands.

But a significant carbon price would change this by prompting the introduction of important emission control technologies in the sector, especially carbon capture and storage. Even at a price of \$100 for each tonne of carbon dioxide emitted, the added cost of producing a barrel of oil from a state-of-the-art oil sands operation would be only about \$6.

Would there be competitiveness impacts if Canada moves more aggressively on carbon pricing than the U.S.? Shouldn't we integrate our approaches?

Economic studies generally indicate that taking aggressive action on climate change would have much more limited impacts on international competitiveness that is often suggested (see "Addressing Competitiveness Concerns" sidebar). Governments could opt to establish an independent expert panel to determine which sectors are truly vulnerable to competitiveness impacts and to recommend appropriate compensation measures.

Linking the U.S. and Canadian cap-and-trade systems in the future would produce a common carbon price and minimize competitiveness impacts. However, economic analysis shows that in the near term, Canada will need a higher carbon price than the U.S. to meet our climate change obligations.

Analysis from the IEA shows the transformation needed in the world's energy system to have a chance of limiting global warming to 2°C. Cap-and-trade is a key policy driver in this transformation. Different cost assumptions and policy choices would change the balance between energy sources like renewables and nuclear.

Addressing Competitiveness Concerns

Protecting the competiveness of the Canadian economy is important for economic reasons, but it matters environmentally too. We're no farther ahead in cutting GHG emissions if polluters simply move to another jurisdiction without cleaning up their production (this is known as "carbon leakage").

Fortunately, for the large majority of Canada's economy, the impact of climate action on international competitiveness is likely to be marginal. For example, a recent World Trade Organization report observes that "studies to date find generally that the cost of compliance with an emission trading scheme is a relatively minor component of a firm's overall costs." In Canada, a 2009 C.D. Howe Institute study found that "the overall competitiveness and leakage impacts associated with climate change policy in Canada are likely to be small," even in a scenario where Canada has a price of \$115 per tonne of carbon dioxide equivalent by 2020 and our trading partners have no price on emissions.

Most competitiveness impacts from carbon pricing would tend to be transitional and apply to a few high-emitting, trade-exposed sectors such as metal smelting, cement, and oil and gas. Governments could use revenue from the auction of allowances and other targeted policies to provide additional support for workers and communities as these sectors adjust to a carbon-constrained world.

There are also important competitiveness concerns raised by moving too slowly to tackle global warming. If Canada fails to match the much stronger policies to support renewable energy and energy efficiency now being implemented in the U.S., we can expect to see investments in these emerging sectors go south of the border.



Climate Leadership, Economic Prosperity:

Economic modelling by M.K. Jaccard and Associates, commissioned by the Pembina Institute and David Suzuki Foundation, shows Canada can reduce its emissions dramatically with an ambitious policy package while also growing the economy. By 2020, Canada's GHG emissions, taking into account our investments in international emission reductions, could fall to 25% below the 1990 level (a target in line with the 2°C limit agreed by all major emitting countries) while the economy grows an average of 2.1% each year and the total number of jobs grows by 11%.

	Annual GDP growth 2010–20	Net new jobs created 2010–20	Net emissions in 2020 (relative to 1990)
2°C emissions target	2.1%	1.86 million	- 25%
Business as usual	2.4%	1.80 million	+ 47%



Canada's GDP and emissions in 2020, relative to 2010

Canada's GDP can grow nearly as fast as under business as usual, while meeting an emissions target consistent with limiting global warming to 2°C.

Ensuring Fairness

Tackling climate change in Canada will result in different costs for different sectors and regions. But governments can reduce these discrepancies by designing policies carefully. For example, the federal government could reduce regional disparities by ensuring that revenue raised from the auction of emission allowances is re-invested largely in its province of origin. Ensuring a fair transition to low-carbon growth will also require measures to protect low- and fixed-income Canadians. There are many tools, including targeted rebates, energy efficiency programs and tax reductions, which can limit or completely offset cost impacts.

For example, the U.S. Congressional Budget Office estimates that the cap-and-trade system in the Waxman-Markey legislation (passed by the House of Representatives in June 2009) would have a net positive impact on the 20% of Americans with the lowest incomes.

Pembina's Perspective

Canada has a tremendous opportunity to transform its economy and be a leader on climate change. We have the technology, resources and innovative capacity we need to make deep reductions in our emissions, consistent with limiting global warming to 2°C relative to pre-industrial levels. Moreover, we can meet an emissions target consistent with the 2°C limit while growing our economy and jobs (see "Climate Leadership" at left). But governments must move immediately to put in place the necessary policies.

- Canada must move urgently to implement a comprehensive and ambitious climate change plan that is capable of reducing Canada's net emissions to at least 25% below the 1990 level by 2020 and 80% by 2050.
- At the core of this plan must be an economy-wide cap-and-trade system. This should auction 100% of allowances and strictly limit or avoid the use of offsets. Economic modelling (see "Climate Leadership") indicates that the resulting carbon price needs to be \$50 per tonne (carbon dioxide equivalent) in 2010, rising to \$200 per tonne by 2020. Alternatively, these price levels could be established through a carbon tax.
- Canada must agree, as part of a new global climate deal, to commit its fair share of financing to help developing countries adapt to climate impacts they did little to cause, and to help accelerate their transition to low-carbon development. One way to generate the necessary funds is through the auction of allowances in Canada's cap-and-trade system.

More Information

For in-depth reports, backgrounders and updates on the latest climate news and negotiations, go to climate.pembina.org.

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