



CIGI PAPERS
NO. 105 — MAY 2016

CLOSING THE GAP BETWEEN CANADIAN EMISSIONS TARGETS AND PERFORMANCE

THE ROLE OF A NATIONAL CARBON TAX

JEFF RUBIN



**CLOSING THE GAP BETWEEN CANADIAN EMISSIONS TARGETS AND PERFORMANCE:
THE ROLE OF A NATIONAL CARBON TAX**

Jeff Rubin



Copyright © 2016 by the Centre for International Governance Innovation

The opinions expressed in this publication are those of the author and do not necessarily reflect the views of the Centre for International Governance Innovation or its Board of Directors.



This work is licensed under a Creative Commons Attribution — Non-commercial — No Derivatives License. To view this license, visit (www.creativecommons.org/licenses/by-nc-nd/3.0/). For re-use or distribution, please include this copyright notice.

Centre for International Governance Innovation, CIGI and the CIGI globe are registered trademarks.



67 Erb Street West
Waterloo, Ontario N2L 6C2
Canada
tel +1 519 885 2444 fax +1 519 885 5450
www.cigionline.org

TABLE OF CONTENTS

iv	About the Global Economy Program
iv	About the Author
1	Executive Summary
1	The Global Challenge
1	Canada's Emissions Reduction Commitments
2	The Need for a National Standard for Carbon Pricing
3	Provincial Disparities in Emissions Pricing and Emissions Trends
5	Interprovincial Carbon Leakage
5	Harmonizing a Federal Carbon Tax with Provincial Emissions Pricing
6	Taxing Carbon Emissions: A Tax Shift or a Tax Hike?
7	Levelling the Field: The Need for Carbon Border Adjustments
8	Policy Recommendations
10	Works Cited
12	About CIGI
12	CIGI Masthead

ABOUT THE GLOBAL ECONOMY PROGRAM

Addressing limitations in the ways nations tackle shared economic challenges, the Global Economy Program at CIGI strives to inform and guide policy debates through world-leading research and sustained stakeholder engagement.

With experts from academia, national agencies, international institutions and the private sector, the Global Economy Program supports research in the following areas: management of severe sovereign debt crises; central banking and international financial regulation; China's role in the global economy; governance and policies of the Bretton Woods institutions; the Group of Twenty; global, plurilateral and regional trade agreements; and financing sustainable development. Each year, the Global Economy Program hosts, co-hosts and participates in many events worldwide, working with trusted international partners, which allows the program to disseminate policy recommendations to an international audience of policy makers.

Through its research, collaboration and publications, the Global Economy Program informs decision makers, fosters dialogue and debate on policy-relevant ideas and strengthens multilateral responses to the most pressing international governance issues.

ABOUT THE AUTHOR



Jeff Rubin is a CIGI senior fellow. A Canadian economist and author, Jeff is a world-leading energy expert and former chief economist at CIBC World Markets. At CIGI, he is currently researching the impacts and opportunities for Canada in its transition toward a more sustainable economic model.

Jeff's work explores the future of Canada's oil sands in an emissions-constrained world, the divestment of Canadian fossil fuels, the case for a national carbon tax and the evolving value of Canadian resources.

One of the world's most sought-after energy experts, Jeff was one of the first economists to accurately predict soaring oil prices back in 2000. His first book, *Why Your World Is About to Get a Whole Lot Smaller*, released in 2009, was an international bestseller and was favourably reviewed in both *Time* and *Newsweek*. It was the number-one-selling non-fiction book in Canada and won the National Business Book Award.

Jeff released two further bestselling books through Random House Canada: *The End of Growth* (2012), which examines the impact of triple-digit oil prices on global economic growth; and *The Carbon Bubble* (2015), which examines how climate change would impact the Canadian economy and, in particular, the country's ambitious energy plans.

EXECUTIVE SUMMARY

Prime Minister Justin Trudeau has announced his intention of forging a national climate change strategy with the provinces to reduce carbon dioxide (CO₂) emissions to at least 30 percent below their 2005 levels by 2030. Yet without a national standard for emissions pricing, and a federal mechanism to enforce it, the country has been left with a hodgepodge of highly disparate provincial emissions regulations that put Canada in no better position to achieve current emissions targets than it was to meet past targets. The federal government needs to assume a leadership role by establishing a national carbon tax that can be harmonized with existing provincial pricing mechanisms to achieve national emissions reduction targets.

THE GLOBAL CHALLENGE

With atmospheric carbon already registering a record 409 parts per million,¹ the world has less than three decades left at the rate of current annual global emissions before carbon readings breach the critical 450 level, a threshold the world's scientific community warns the world must not exceed. In an effort to remain within that carbon threshold and avert the worst consequences of emissions-driven climate change, there is a widespread and growing international effort to dramatically reduce carbon emissions. Representatives from more than 150 nations recently went to New York on April 22, Earth Day, to sign commitments they made earlier at the twenty-first session of the Conference of Parties to the United Nations Framework Convention on Climate Change (COP 21) in Paris to restrict the growth of future greenhouse gas emissions.

The growing urgency for action follows mounting evidence not only of anthropogenically induced climate change but also the huge costs that it poses for the global economy. The increased frequency of extreme weather events has already caused billions of dollars of flood and drought damage, while rising sea levels threaten to inundate low-lying coastal regions within this century and submerge billions of dollars of coastal real estate.² Left unchecked, emissions-driven climate change is expected to induce major economic dislocation around the world. Moreover, the longer the world waits to reduce emissions, the greater the economic costs associated with runaway global climate change.

1 See <https://scripps.ucsd.edu/programs/keelingcurve/>.

2 *Risky Business: The Economic Risks of Climate Change in the United States*, an in-depth assessment of the vulnerability of the US economy to climate change, sponsored by former New York mayor Michael Bloomberg and former Treasury Secretary and Goldman Sachs executive Henry Paulson, estimates that by as early as 2050, between US\$66 and US\$106 billion of existing US coastal property will be below sea level (Risky Business Project 2014).

Initial studies of the economic damage posed by climate change — such as the landmark report by Lord Nicholas Stern prepared for the British Parliament — estimated as much as a 20 percent reduction in global GDP. Updated estimates from the London School of Economics Grantham Research Institute on Climate Change suggest that even larger economic impacts may soon be on the horizon as climate change forces an increasing share of global investment to be diverted from building new productive capacity to repairing damaged infrastructure while forcing the movement of entire industries and, potentially, more than 600 million people from low-lying coastal areas (Dietz and Stern 2014).

In Canada, the financial impacts of climate change are already being felt with the increased frequency of costly extreme weather events such as the record flooding that caused more than a billion dollars of flood damage in Calgary in 2013 and the catastrophic forest fires that recently ravaged Fort McMurray, forcing the largest evacuation in Alberta's history. Insurance claim estimates from the fire have run as high as \$9 billion (Morgan 2016).³ While there is no ironclad mechanism for linking specific devastating events such as the Fort McMurray area fire to climate change, global research indicates that the boreal forest has not burned this frequently in at least the last 10,000 years. In Canada, home to one of the largest boreal forests, annual forest losses due to fires are already running at double what they were only decades ago, in line with rising average temperatures (Schwartz 2016).

The mounting economic costs of climate change challenge traditional notions that there is a fundamental trade-off between economic growth and environmental protection. In the past, the fossil fuel industry has warned that switching from low-cost fuels to higher-cost renewable energy sources will come at the expense of future economic growth. But in a world that will soon incur increasing economic costs from emissions-driven climate change, the polar opposite is true. Failure to reduce reliance on fossil fuels does not accelerate growth, but rather hastens the pace of climate change, bringing with it mounting costs and disruption to the global economy. If those costs are to be minimized, decarbonization provides the only environmentally sustainable path for future economic growth.

CANADA'S EMISSIONS REDUCTION COMMITMENTS

Decarbonization is commonly measured by reducing emissions per unit of GDP. Stabilizing the carbon footprint of a dynamic economy requires that carbon emissions per unit of GDP must fall at the same rate that GDP expands. Most developed countries, including Canada, have committed

3 Unless otherwise noted, figures are in Canadian dollars.

to sizable absolute reductions in future emissions levels, which requires that the rate of decarbonization in the economy exceed the rate of economic growth. For that condition to hold, future growth in the Canadian economy is only possible through deep cuts in emissions per unit of GDP.

Canada formally committed to decarbonizing its economy when the former Harper government pledged to reduce the country's 2020 emissions to a level 17 percent below 2005 levels at the United Nations 2009 Copenhagen Climate Change Conference. Subsequently, just prior to the 2015 federal election, the Harper government committed Canada to even deeper decarbonization with its pledge to reduce 2030 emission levels 30 percent below 2005 levels. Canada's emissions reduction targets are broadly in line with other Organisation for Economic Co-operation and Development economies, and very closely calibrated to those of the country's major trading partner and neighbour, the United States (President Obama pledged to reduce US emissions by 26–28 percent by 2025).

While the emissions reduction targets themselves call for broad and rapid decarbonization of the country's economy, actual Canadian emissions have performed notoriously poorly relative to their targets. The Canadian legacy of badly missed emissions targets dates back to the country's original emissions reduction obligations under the Kyoto Protocol, which the Harper government ultimately chose to withdraw from in 2011 when compliance was hopelessly out of reach. In contrast, the United States is largely on track to meeting its emissions targets, owing, for the most part, to the widespread replacement of coal by shale gas in power generation.⁴

The Harper government's commitment to achieving its emissions reduction targets was viewed with widespread skepticism, both at home and abroad, given its ardent support for the massive and rapid development of the Alberta oil sands, the single largest industrial source of carbon pollution in the country. However, the political landscape of the country has changed dramatically with the election of a new Liberal government under Justin Trudeau, which claims to have made climate change mitigation a policy priority, a point emphasized by the renaming of the Ministry of the Environment as the Ministry of the Environment and Climate Change. Prime Minister Trudeau reaffirmed the country's commitment to achieving the Harper government's emissions reduction targets at COP 21, calling them a bare minimum for his administration.

4 Once accounting for more than half of all power generation in the United States, coal's share fell to a record low 34 percent in 2015 as cheap natural gas continued to close coal plants around the country. As a result, actual CO₂ equivalent emissions (CO₂e) from the power sector have already fallen 18 percent below 2005 levels, more than halfway to achieving President Obama's goal of a 32 percent reduction in emissions from power plants by 2030 (Goldenberg 2016).

Minimum or not, there is still no credible plan for the country to achieve either its short-term emissions target for 2020 or its longer-term target for 2030. While the emission intensity of the Canadian economy has declined, CO₂e emissions⁵ are still strongly tied to economic growth. The only period in which emissions fell was from 2008 to 2010, where emissions declined by almost 10 percent during one of the country's deepest postwar recessions. Canada's emissions resumed their upward trajectory on the heels of an economic recovery and by 2013 had recovered roughly half the emissions reductions incurred during the last recession (see Figure 1).

Barring another major recession, Environment and Climate Change Canada projects that emissions will continue to rise, reaching 766 megatonnes (Mt) by 2020, more than 140 Mt above the target level. The amount by which Canada is projected to miss its 2020 emissions target is broadly equal to the emissions from electricity generation and from buildings — more than 20 percent of the country's total. Moreover, Environment and Climate Change Canada projects that the country is on course to miss the longer-term 2030 target by an even greater margin — it estimates that CO₂e emissions will increase to between 768 Mt and 870 Mt by 2030, compared to Canada's commitment to reduce 2030 emissions to 524 Mt (30 percent below 2005 levels).

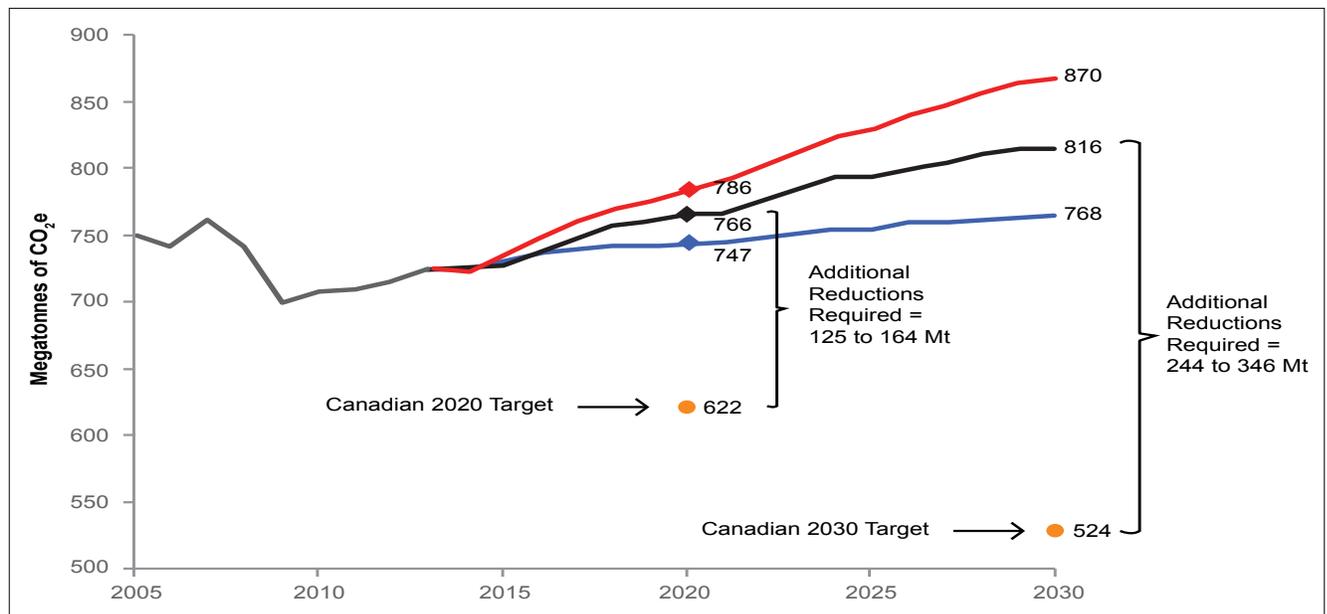
Even in Environment and Climate Change Canada's most optimistic low emissions projection, emissions will still come in a staggering 244 Mt (roughly 45 percent) above the 2030 target. While cancelled oil sands expansion projects and the potential closure of some existing bitumen production could reduce this amount, the fact remains that even if the oil sands and its more than 60 Mt of emissions were entirely mothballed, Canada's emissions would still be on track to come in almost 200 Mt higher than targeted. Clearly the challenge the country faces in meeting its emissions targets is not simply about the emissions profile of one industry. Instead, the magnitude by which targets are likely to be missed suggests an urgent need to achieve economy-wide reductions in CO₂e emissions.

THE NEED FOR A NATIONAL STANDARD FOR CARBON PRICING

There is a widespread consensus among economists that taxing/pricing emissions is the most efficient mechanism for achieving economy-wide decarbonization, although — in the absence of meaningful emissions prices — regulatory changes, such as Ontario's decision to phase

5 CO₂e measures the impact of other greenhouse gases on global warming by expressing them as an equivalent amount of CO₂. Environment and Climate Canada's measure includes seven greenhouse gases: CO₂, methane, nitrous oxide, sulphur hexafluoride, perfluorocarbons, hydrofluorocarbons and nitrogen trifluoride.

Figure 1: Canada CO₂e Emissions and Emissions Targets



Source: www.canada.ca/en/environment-climate-change/briefing/key-issues-climate-change.html.

out coal-fired generating plants, can significantly reduce emissions in some sectors.

Not only do emissions prices provide direct financial incentives for carbon polluters to reduce their emissions, but they also incent technological change in favour of non-emitting renewable energy. If Canada is at last going to live up to the emissions reduction targets that it has pledged to the international community, the country will need to price carbon emissions much more aggressively than it has in the past and it will need to do so across the entire economy, not just in selected provinces that have chosen their own emissions pricing regimes.

Economic models project that carbon prices as high as \$150–\$200 per tonne will be required to lever the emissions reductions mandated by the country’s 2030 commitment.⁶ Those emissions prices are five to almost seven times the highest price being currently charged in any Canadian jurisdiction. Projected triple-digit emissions prices estimated to achieve the 2030 Canadian emissions reduction target are broadly in line with emissions prices in other countries that have achieved the deep decarbonization sought by the Canadian target.

For example, Sweden, a country that is targeting to cut its emissions to 40 percent below its 1990 levels by 2020,

6 See, for example, Nicholas Rivers (2014), who argues the country will have to impose a tax at least equal to \$150 per tonne. Environmental economist David Sawyer (2013) estimates the country will need a carbon tax as high as \$180 by 2030 to achieve the emissions reduction targets pledged by the Harper and now Trudeau governments. An advisory committee to BC Premier Christy Clark urged for carbon taxes as high as \$150 per tonne by that date (McCarthy 2016a).

introduced a carbon tax in 1991 at US\$133 per tonne, which was raised in 2014 to more than US\$150 per tonne. In addition, regulatory measures were taken to switch fuel sources for power and heat generation that had effective carbon prices of well over US\$100 per tonne.⁷

A national emissions price has played a central role in decarbonizing the Swedish economy. Unfortunately, no such price yet exists in Canada. Instead, the federal government, best positioned to establish a national emissions price, has so far abdicated responsibility for emissions pricing to the provinces. The result is a disjointed patchwork of different provincial regulations with widely divergent emissions prices and, in some cases, no mechanism to price emissions at all.

PROVINCIAL DISPARITIES IN EMISSIONS PRICING AND EMISSIONS TRENDS

The high-water mark for emissions pricing in the country remains British Columbia’s \$30 per tonne carbon tax, providing an obvious benchmark for a federally mandated national emissions price. First introduced in 2008 by then BC Premier Gordon Campbell at \$10 per tonne, the province’s carbon tax was originally intended to be raised by \$5 per tonne every year. The province’s current premier, Christy Clark, froze the tax at \$30 per tonne during the 2013 provincial election campaign, arguing that the rest of the country needed to catch up on pricing emissions before British Columbia could increase its carbon tax rate any further.

7 See www.carbontax.org/where-carbon-is-taxed/#Sweden.

Alberta intends to introduce its own carbon tax next year. In 2017, the province's first New Democratic Party (NDP) government will roll out a new economy-wide carbon tax of \$20 per tonne, which will be raised to \$30 per tonne the following year. The province will also be imposing a hard cap on annual emissions from the oil sands and has pledged to shut down all coal-fired power plants by 2030 (coal-fired power plants currently produce almost 40 percent of Alberta's power).

Whereas both Alberta and British Columbia have opted for administratively less costly and readily transparent carbon taxes, Quebec and Ontario have turned to more complex and opaque cap-and-trade systems to price emissions. In 2013, Quebec introduced a cap-and-trade system and later integrated its system with California's, creating the first cross-border carbon market in North America. The province originally set a price floor of \$10.75 per tonne for emissions prices but committed to raising this price annually. Emissions credits have recently been trading in the \$15–\$17 range and emissions allowances are expected to auction for around \$20 per tonne by the end of the decade. Ontario has announced that it will be joining this program — known as the Western Climate Initiative — in 2017 through its own cap-and-trade program, with initial emissions prices expected to be auctioned at around \$18 per tonne (Government of Ontario 2016).

While cap-and-trade systems in Quebec and Ontario provide a mechanism to raise emissions prices in the

future, current auction prices fall well short of thresholds that would adversely impact demand for fossil fuels and are a fraction of the emissions prices that will ultimately be needed to achieve national emissions reduction targets. Ontario's new cap-and-trade system, for example, will add only 4.3 cents per litre to the price of gasoline and only 3.3 cents per cubic metre to the price of natural gas, roughly a \$5 per month increase in costs for households relying on gas heating (*ibid.*, 27). The impact of these emissions-driven price increases on either motor fuel consumption or use of natural gas heating, and hence the emissions associated with the combustion of these fuels, is marginal at best.

There are currently no carbon pricing mechanisms at all in Newfoundland, Nova Scotia, Prince Edward Island, New Brunswick or Manitoba, although the former NDP government in Manitoba made a commitment to joining the Western Climate Initiative's cap-and-trade system at some point in the future (Canadian Press 2015).

Interprovincial differences in emissions pricing are exceeded by even larger differences in actual emissions performance. Some provinces have actually reduced their carbon footprint while others have significantly increased their emissions. Ontario and Quebec have both lowered emissions below 1990 levels, the original base year for the Kyoto Protocol (see Table 1). Both provinces can thank their largely non-emitting power generation systems and a contraction of their industrial base for the favourable emissions result. At the other end of the spectrum, Alberta's

Table 1: CO₂e Emissions by Province and Territory, Canada, 1990, 2005 and 2014

Province or Territory	1990 Greenhouse Gas Emissions (Mt of CO ₂ e)	2005 Greenhouse Gas Emissions (Mt of CO ₂ e)	2014 Greenhouse Gas Emissions (Mt of CO ₂ e)
Newfoundland and Labrador	9.6	10.2	10.6
Prince Edward Island	2.0	2.1	1.8
Nova Scotia	20.0	23.5	16.6
New Brunswick	16.4	20.5	14.9
Quebec	89.1	89.7	82.7
Ontario	181.8	210.6	170.2
Manitoba	18.7	20.7	21.5
Saskatchewan	45.1	69.6	75.5
Alberta	175.2	233.0	273.8
British Columbia	52.9	65.2	62.9
Yukon	0.5	0.5	0.3
Northwest Territories	1.6*	1.7	1.5
Nunavut	n/a	0.3	0.3

Note: n/a = not applicable.

* 1990 emissions data for the Northwest Territories include emissions for Nunavut, which was part of the Northwest Territories until 1999.

Data source: Environment and Climate Change Canada (2016).

emissions have risen by nearly 60 percent since 1990, while Saskatchewan's have risen by almost 70 percent.

Power generation has been a key factor in determining differences in provincial emissions trends. Quebec's hydro-based power generation system is essentially emissions free. In Ontario, which closed the last of its coal-fired plants in 2014, power generation accounts for less than 10 percent of total emissions. By comparison, power generation in largely coal- and gas-fired systems in Saskatchewan and Alberta accounts for more than twice the percentage of total provincial emissions compared to Ontario (McCarthy 2016a).

Natural resource endowments, in particular the location of oil and gas deposits, have also had a major impact in shaping provincial emissions trends over the last two decades. In Alberta, the oil sands and the rest of the oil and gas industry account for nearly half of total provincial emissions, while in neighbouring Saskatchewan, the oil, gas and mining sectors account for just over one-third of emissions. By contrast, emissions from the oil and gas sector are trivial in Ontario and Quebec, the two provinces that have made the greatest progress so far in reducing carbon emissions (*ibid.*).

Both factors are likely to continue to drive highly divergent emissions trends among the provinces. But a third factor — provincial emissions pricing policies — could become more important over time. As emissions prices rise in some provinces, while others refrain from putting any price on their emissions, interprovincial policy differences could become increasingly significant to the location of emissions intensive economic activity.

INTERPROVINCIAL CARBON LEAKAGE

In the absence of a national standard emissions price, different provincial emissions policies could encourage interprovincial carbon leakage. Just as international differences in emissions pricing can induce emitting industries to migrate to emissions-friendly countries, large interprovincial differences in emissions pricing create similar incentives for major carbon polluters to migrate across the country to where they are least penalized.

Of course, not all emissions are mobile and hence not all polluters are able to arbitrage provincial or international differences in emissions prices. Those tied to resource extraction are grounded in their province of origin, but the processing of resources is mobile and so are the emissions associated with those activities.

Alberta's oil sands are a classic case in point. While emissions from the extraction of bitumen are obviously chained to the resource's location in northern Alberta, the emissions from upgrading the raw bitumen into oil and those associated with the refining of that oil into

more value-added products, such as motor fuels and petrochemicals, are very mobile.

Roughly half the bitumen extracted from the oil sands is not even upgraded into oil in the province, while less than 15 percent is actually refined into finished products (Rubin 2016). Some bitumen is piped across the country to Sarnia, Ontario, as a feedstock for petrochemicals, although the vast majority of Alberta's bitumen is sent to the United States for upgrading and refining. In the process, Alberta, due to a lack of refinery capacity, exports a sizeable amount of its potential emissions (as well as billions of dollars of potential value-added) across both interprovincial and international borders.

If not addressed through a federally mandated national standard, interprovincial carbon leakage could increase over time as some provinces ratchet up their emissions prices while other provinces, attempting to protect large carbon-emitting industries such as coal-fired power plants, lag further behind. Interprovincial carbon leakages can only frustrate the future achievement of national emissions reduction targets as emissions from mobile industries are simply shifted across the country instead of abated.

HARMONIZING A FEDERAL CARBON TAX WITH PROVINCIAL EMISSIONS PRICING

Although the Trudeau government campaigned on a pledge to price carbon emissions during the last election, it has yet to announce how it intends to fulfill that promise.

Federal Environment and Climate Change Minister Catherine McKenna has already served notice that provinces should be free to set their own emissions price levels and choose their own pricing mechanisms, as British Columbia, Alberta, Ontario and Quebec have already done. Whether McKenna's statement means the federal government will rely on the provinces to deliver on its election promise to price carbon emissions, or that the federal government will pursue its own emissions pricing mechanism, remains to be seen.

The existence of functioning provincial systems to price CO₂e emissions hardly precludes the federal government from establishing its own emissions pricing mechanism, any more than provincial sales or income taxes preclude federal counterparts. A federal carbon tax would ensure a minimum country-wide emissions price where the federal rate would top up existing provincial prices on carbon emissions to reach the federally mandated national emissions price. Over time, the federal government could adjust the national standard rate to ensure the achievement of national emissions reduction targets. The federal and provincial emissions pricing mechanisms could be integrated together in much the same way as provincial and federal sales taxes are integrated through the HST (harmonized sales tax).

Not only could a national carbon tax readily dovetail with existing provincial pricing programs to achieve a national standard for carbon pricing, but the very existence of a federal carbon tax would in itself provide a powerful incentive for provinces to price their own emissions up to the national standard. In a harmonized federal-provincial emissions pricing system, in which the federal rate would top up provincial emissions rates, provincial governments will want to ensure that they, not the federal government, capture the bulk of — if not all — the emissions revenues collected in their jurisdictions.

Consider, for example, how differently a \$30 per tonne federal carbon tax would play out in Alberta, which will soon have the same provincial rate, and Saskatchewan, which has no provincial pricing mechanism and has no plans to establish one. With emissions per capita that are five to seven times that of the rest of the country, the incidence of a federal carbon tax will be greatest in those two provinces.

In Alberta's case, a provincial carbon tax equal to the national rate of \$30 per tonne could raise as much as \$6 billion in emissions revenue for the provincial treasury (Blackwell 2016).⁸ In neighbouring Saskatchewan, which has no provincial mechanism to price emissions, all of the nearly \$1.5 billion in potential revenue raised by a \$30 per tonne carbon tax in the province would accrue entirely to the federal government (*ibid.*). If ever there was a fiscal incentive for provincial governments to put a meaningful price on their own province's carbon emissions, defaulting to a federally collected carbon tax would be a very hard one to ignore. This is all the more true when one considers that a \$30 per tonne federal carbon tax would be an initial starting point — as noted previously, much higher prices will be needed to achieve national emissions reduction targets, although over time the carbon tax base would presumably shrink, limiting the increase in revenue flows.

TAXING CARBON EMISSIONS: A TAX SHIFT OR A TAX HIKE?

It is widely recognized that the tax system can play a key role in promoting the transition to a decarbonized economy. Like “sin taxes” imposed on alcohol and tobacco, carbon taxes can discourage the combustion of fossil fuels by making such energy increasingly expensive to users. However, carbon is not a niche product in the economy like tobacco and alcohol, which governments have typically taxed at punitive rates to discourage consumption. Comparatively speaking, the carbon tax base is huge. Hence, even relatively low emissions prices/carbon taxes can yield significant revenue flows, given the size of the carbon tax base. This raises the danger that governments

may simply use emissions pricing as a means of generating new revenues without ever raising emissions prices high enough to incent households and businesses to reduce their reliance on fossil fuels.

For example, under Ontario's soon-to-be-implemented cap-and-trade system, an \$18 price for emissions allowances that will add only four cents per litre to gasoline prices will at the same time raise nearly \$2 billion in new government revenue during the system's first full year of operation. At a \$30 per tonne emissions price, Ontario's cap-and-trade system could generate almost \$4 billion a year in revenue. As emissions prices ultimately move toward levels deemed necessary to achieve the country's 2030 emissions reduction target, as much as \$40 billion in annual emissions revenue could be generated every year by provincial and federal governments (Cameron 2016). If not offset through other measures, emissions revenues of this magnitude, whether raised through a carbon tax or through the auctioning of emissions credits in cap-and-trade systems, could become a significant fiscal drag on economic growth. For example, the \$40 billion estimate of emissions revenue would amount to four times as much a brake on annual economic growth as the recent federal budget's \$10 billion stimulus package added to growth.

Moreover, public acceptance, and hence underlying political support for paying triple-digit emissions prices, is unlikely unless taxpayers are compensated through offsetting reductions in other taxes. The principle of fiscal neutrality has been critical in maintaining public support for British Columbia's carbon tax — the country's longest-standing emissions pricing program, which raises more than a billion dollars in annual revenue but redistributes this amount back to households and businesses through lower personal and corporate income taxes.

It can even be argued that fiscally neutral emissions pricing should be stimulative for the economy. To the extent that taxpayers spend less at the pumps, which British Columbia's drivers have done since their province's carbon tax came into existence, the offsetting cuts in personal and other taxes gives them more disposable income to spend on other less emissions-intensive goods and services in the economy.

In contrast to British Columbia's fiscally neutral carbon tax, Ontario intends to use as much as \$7 billion in emissions revenues over a four-year period to subsidize the retrofitting of buildings, encourage the use of renewable energy for heating, provide incentives to purchase electric cars, and subsidize industries to cut emissions (Morrow and Keenan 2016). While the policy intent is broadly aimed toward decarbonizing the Ontario economy, the provincial government's failure to commit to fiscal neutrality raises a number of dangers.

⁸ Estimates for Alberta and Saskatchewan emissions revenues are from the EcoFiscal Commission, reported in Blackwell (2016).

Not only would rapidly growing emissions revenues jeopardize public support for the much higher emissions prices that will ultimately be needed to achieve emissions reduction targets, it would also give the provincial government a steadily growing role in allocating resources in the economy through the redeployment of emissions revenues. While the redeployment of emissions revenues in support of green energy may be well intentioned, it is far from clear what comparative advantage politicians or bureaucrats in the Ontario government have over the market's ability to do so, providing that the true cost of carbon emissions are internalized into the market decision-making process through a sufficiently high price that recognizes the full cost of carbon pollution.

The market failure that government emissions pricing is designed to address is not the market's inherent inability to allocate resources efficiently but rather the failure of the market to internalize the true costs of carbon pollution in making resource allocation decisions. Critics of Ontario's revenue-enhancing cap-and-trade system have argued that if emissions prices were high enough to reflect the true cost of carbon pollution, they would, on their own, induce corporations and households to shift from fossil fuels to renewable energy, without billions of dollars of public subsidies greasing the switch.⁹

LEVELLING THE FIELD: THE NEED FOR CARBON BORDER ADJUSTMENTS

Decarbonizing the economy while remaining internationally competitive is unquestionably the most challenging aspect of the transition to a sustainable economy in a trade-dependent economy such as Canada. The extent to which countries can commit to decarbonization depends, in large measure, on the ability of their economies to remain competitive when their trading partners fail to commit to the same emissions standards.

Domestic firms that are forced to internalize the costs of their own emissions through paying either carbon taxes or purchasing emissions allowances in a cap-and-trade system will be competitively disadvantaged if competing imports are not required to pay a similar cost for their emissions. Similarly, exporters would be disadvantaged when competing in foreign markets against goods from other countries that are not required to pay for their emissions.

Without competitive safeguards, critics of carbon pricing have argued that unilateral attempts at restricting emissions simply induce them, and the industries that create them, to migrate to other jurisdictions that do not enforce their inclusion in production costs. Since climate

change is driven by global, not national, emissions, there is no net environmental benefit if emissions reductions in one part of the world are simply offset by emissions travelling to a less-regulated part of the world. Hence, the argument goes, why sacrifice local jobs, wages and tax revenues for no net environmental benefit?

In response to these concerns, the cap-and-trade system in California effectively exempted — through the provision of free credits — industries deemed particularly vulnerable to emissions pricing. Sectors eligible for such treatment have had to meet two broad criteria: they are energy intensive and they are trade exposed. Sectors are considered energy intensive if at a US\$40 per tonne emissions price, the value of emissions payments is above five percent of industry shipments. Sectors are considered to be trade intensive if the value of exports and imports is more than 15 percent of industry shipments (Sawyer 2013).

Industries meeting these criteria typically include some of the largest carbon polluters. Under California's cap-and-trade system, many of the state's largest emitters, including oil and gas extraction, paper mills, steel and iron, chemicals and cement, are all effectively exempted through the provision of free emissions credits. Moreover, emissions prices in California's cap-and-trade system are trading at little over a quarter of the US\$40 per tonne price used to determine industry eligibility for free allowances.

In Quebec, aluminum smelters, along with the province's two oil refineries, are provisioned with free credits. Ontario has taken industry exemptions to new heights in its cap-and-trade program, invoking new criteria that effectively exempts, through the provision of free emissions credits, more than 100 of its largest industrial emitters who collectively emit more than 40 Mt of CO₂e annually — the bulk of industrial emissions in the province (McCarthy 2016b).

Not only does the provision of free credits to large-scale industrial polluters violate the polluter-pays principle, it also unfairly shifts the burden of emissions reduction to other sectors of the economy. Ontario, for example, plans to achieve most of its emissions reduction targets through big cuts from the transportation and building sectors. The provision of free credits has been found to confer an unfair subsidy to major polluters. Moreover, the provision of free emissions credits to major carbon polluting sectors, such as the cement industry, for example, only encourages the use of their product and frustrates efforts to find less emissions-intensive building materials that will be required for the deep decarbonization of the economy.

While energy-intensive, trade-exposed (EITE) industries account for only four percent of GDP, Environment Canada (2014) estimates that they produce more than 10 percent of the country's total emissions. If other provinces use the much broader criteria that Ontario uses

⁹ See, for example, *The Globe and Mail* (2016).

for the provision of free allowance under its cap-and-trade system, the percentage of emissions exempted could climb considerably higher.

While EITE industries can rightfully ask their provincial and federal governments to provide a level playing field, there are other policy mechanisms that could achieve this result without effectively exempting the economy's largest industrial carbon polluters from paying for their emissions. Carbon border adjustments such as a carbon tariff would ensure that all products sold in the Canadian market, regardless of origin, are required to pay the same price for the CO₂e emissions embodied in their production. As long as national treatment provisions were respected, requiring that imports are charged no greater a price for their emissions than domestic firms, a carbon tariff should be compatible within a World Trade Organization framework (Pauwelyn 2012).

Carbon border adjustments would, of course, be even more effective if export markets were also covered. In an ideal world, Canadian exporters would want to operate in a global trading system with a standard price for carbon emissions. But in the absence of a common global carbon tariff, Canada could pursue bilateral or multilateral agreements just as it has already done with respect to trade liberalization, first through the Canada-US Free Trade Agreement and later through the North American Free Trade Agreement (NAFTA). Bilateral or multilateral trade agreements on emissions pricing could level the playing field for Canadian exports in their principal markets, and hence enable them to pay full domestic emissions prices without undermining their competitiveness.

The concept of a common transborder carbon price is already established in the Western Climate Initiative trading system, in which both Quebec and California already participate and that Ontario is about to join. A federal bilateral agreement with the United States, which has similar emissions reduction targets as Canada, would extend a common carbon price to all US states and all Canadian provinces and territories.

Considering that more than three-quarters of Canada's external trade is with the United States, a common agreement on carbon border adjustment between Canada and the United States would go a long way in levelling the playing field between Canadian producers and their foreign competitors, both in the domestic market and in their principal export market.¹⁰

Carbon border adjustments turn the whole competitiveness issue on its head. Instead of attempting to safeguard the competitiveness of major industrial polluters by sheltering them from emissions pricing through the provision of

free emissions allowances for extended grace periods, a carbon tariff could in fact confer competitive advantages to EITE sectors. To the extent that high emissions prices compel domestic firms to either reduce their energy intensity and/or switch to greener energy, they suddenly acquire a comparative advantage over imports that have not been forced by their own countries' regulations to make the same adjustments. All of a sudden carbon efficiency becomes a source of comparative advantage. And the higher the domestic price on emissions (and hence the higher the equivalent carbon tariff), the greater the economic advantage that accrues to firms that have lowered their emissions. In that fashion, carbon border adjustments could actually encourage the location of emissions-intensive industries in markets that force their own producers to become the most emissions efficient.

POLICY RECOMMENDATIONS

No single policy measure is likely to be a panacea for decarbonizing the economy. Provincial regulatory policies, such as Ontario's decision, and now Alberta's intention, to close coal-fired power plants, can have a significant impact on reducing emissions. But at the economy-wide level, there remains an urgent need to price emissions to meet existing federally mandated emissions reduction targets.

The federal government's first priority in meeting both its 2020 and 2030 emissions target is to ensure that there is a meaningful and consistent standard for emissions pricing across the country. A national emissions price must be meaningful in the sense that it is set at a significantly high rate to impact economic behaviour and serve to reduce emissions at a rate consistent with achieving national emissions reduction targets. At the same time, a federally mandated emissions price must be consistent in the sense that the federal carbon tax, in conjunction with existing provincial carbon taxes or cap-and-trade programs, should result in the same price for carbon emissions throughout the Canadian economy. Not only would a national carbon tax ensure comprehensive coverage of the country's emissions, but it would remove any incentive for interprovincial carbon leakage that might arise from discrepancies in provincial emissions prices.

To achieve these broad policy objectives, the federal government should consider the following recommendations in the design and scope of an effective climate change strategy with the provinces.

Recommendation 1: A federal carbon tax of \$30 per tonne on CO₂e emissions should be introduced.

The federal government should impose a \$30 per tonne national carbon tax in 2017 that would be blended with existing provincial carbon pricing schemes to ensure uniform carbon emissions pricing across the country. In provinces that fail to implement their own emissions

¹⁰ See Statistics Canada, "Trade Data Online," www.ic.gc.ca/eic/site/tdo-dcd.nsf/eng/Home.

pricing systems, emissions would be taxed at the full federal rate. In provinces with cap-and-trade systems such as Quebec and, soon, Ontario, the federal tax would “top up” the price of provincial emissions allowances, up to the federally mandated \$30 per tonne price. Similarly, in provinces with their own provincial carbon taxes, such as British Columbia, and Alberta as of 2017, the federal tax will be applied on top of existing provincial carbon taxes until the prescribed \$30 per tonne national emissions price is achieved. In provinces that already charge the national emissions rate (British Columbia), or will adjust their own rate to the national standard, either through a cap-and-trade system or their own carbon tax, the federal carbon tax rate would be zero.

Recommendation 2: The federal carbon tax rate should be raised annually to at least \$50 per tonne by 2020 and thereafter periodically reassessed to ensure that carbon tax rates are sufficient to achieve national emissions reduction targets.

Once implemented, the federal government should raise its carbon tax rate by \$10 in 2018 to \$40 per tonne and by a further \$10 per tonne in 2019, in an effort to comply with the near-term emissions reduction target of 622 Mt (17 percent reduction from 2005 emissions levels). In 2020, the federal government, under the auspices of the Ministry of Environment and Climate Change, should reassess what emissions prices will be required over the next decade to achieve the 2030 emissions target of 524 Mt (30 percent reduction from 2005 emissions levels) or a more stringent target, should the Trudeau government decide to set one.

Recommendation 3: Revenues from CO₂e emissions should accrue to the level of government that collects them.

The federal government should retain all revenues raised through the federal carbon tax but should relinquish this tax space to provinces that impose their own fees on emissions. The willingness of the federal government to occupy tax space lying vacant due to the absence of provincial pricing mechanisms for carbon emissions should in itself provide a powerful fiscal incentive for provincial action. If a national pricing standard is to be enforced through a federal carbon tax, provincial inaction could no longer serve to protect high-emission industries in provinces that have chosen not to charge for carbon emissions.

Recommendation 4: The federal carbon tax should be revenue neutral.

Where federal carbon tax revenues are collected as a result of provincial emissions prices falling short of the federally mandated national standard, the revenues should be offset by reductions in other federal taxes. Fiscal

neutrality implies that over time, rising carbon taxes and offsetting reductions in income taxes will shift the tax base from income (a positive for economic growth) to carbon emissions (a negative for climate change and, ultimately, through the feedback of climate change on the economy, a negative for growth as well).

While fiscal neutrality should be the preferred option for provincial emissions pricing, not all provinces are equal in either their fiscal or economic exposure to carbon pricing and hence their ability to offset emissions revenue by cuts in other taxes.

In Alberta, almost 30 percent of total provincial government revenues come from non-renewable resource revenue (oil and gas). Actions to mitigate climate change, taken both domestically and abroad, pose unique challenges to the provincial economy and its dependence on high-cost oil from the oil sands. Revenues from carbon taxes may be needed to mitigate the long-term fiscal impact from plunging oil royalties from both low oil prices and potential declines in high-cost production from the oil sands.

Recommendation 5: The federal carbon tax should apply to all industries provisioned free emissions credits or otherwise exempted from provincial emissions pricing programs.

In order to achieve a level playing field for all industries, there should be no sectoral exemptions from the federal carbon tax. Sectors that are effectively exempted from paying for their emissions, either through the provision of free emissions allowances under provincial cap-and-trade systems or exempted from paying provincial carbon taxes, should be subject to the full federal carbon tax rate. This would include oil refineries and aluminum plants in Quebec that have been provisioned free credits under Quebec’s cap-and-trade system, the oil sands (should they be exempted from Alberta’s carbon tax), any proposed liquefied natural gas plants (should they proceed and be exempted from British Columbia’s carbon tax), as well as the more than 100 largest industrial emitters in Ontario that will receive free emissions allowances under Ontario’s cap-and-trade system.

Recommendation 6: The Canadian government should pursue a North American carbon border adjustment or carbon tariff with its NAFTA trading partners.

Instead of provincial governments attempting to protect EITE and otherwise exposed sectors from carbon emissions pricing, the federal government should pursue a common set of carbon border adjustments with its NAFTA partners — the United States and Mexico — that will level the playing field for carbon pricing across the continent.

WORKS CITED

- Blackwell, Richard. 2016. "Report claims recycled carbon taxes could help provincial economies." *The Globe and Mail*, April 6. www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/report-claims-recycled-carbon-taxes-could-help-provincial-economies/article29529456/.
- Cameron, Mark. 2016. "How carbon taxes can grow the economy and give Canadians a break." *Maclean's*, March 3. www.macleans.ca/economy/economicanalysis/how-carbon-taxes-can-grow-the-economy-and-give-canadians-a-break/.
- Canadian Press. 2015. "Western Climate Initiative Will See Manitoba, Ontario, Quebec Link Up Cap-and-Trade Systems." *Huffington Post*. www.huffingtonpost.ca/2015/12/07/manitoba-ontario-quebec-sign-agreement-to-link-cap-and-trade-systems_n_8739564.html?utm_hp_ref=canada-politics&ir=Canada+Politics.
- Dietz, Simon and Nicholas Stern. 2014. "Endogenous Growth, Convexity of Damages and Climate Risk." Centre for Climate Change Economics and Policy Working Paper No. 180, June. Grantham Research Institute on Climate Change.
- Environment and Climate Change Canada. 2016. "Greenhouse Gas Emissions by Province and Territory." www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=18F3BB9C-1.
- Environment Canada. 2014. *Canada's Emission Trends*. <https://ec.gc.ca/ges-ghg/default.asp?lang=En&n=E0533893-1>.
- Goldenberg, Suzanne. 2016. "US electricity industry's use of coal fell to historic low in 2015 as plants closed." *The Guardian*, February 4. www.theguardian.com/environment/2016/feb/04/us-electricity-industrys-use-of-coal-fell-to-historic-low-in-2015-as-plants-closed.
- Government of Ontario. 2016. *Jobs for Today and Tomorrow: 2016 Ontario Budget*. www.fin.gov.on.ca/en/budget/ontariobudgets/2016/papers_all.pdf.
- McCarthy, Shawn. 2016a. "Canada's carbon challenge: Turning promises into reality." *The Globe and Mail*, January 22. www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/carbon-challenge-the-economic-cost-of-emissions-reduction/article28359647/.
- . 2016b. "NDP slams Liberals' cap-and-trade plan." *The Globe and Mail*, February 25.
- Morgan, Geoffrey. 2016. "Insurers predict Fort McMurray fire to be costliest disaster in Canadian history." *Calgary Sun*, May 13. www.calgarysun.com/2016/05/13/insurers-predict-fort-mcmurray-fire-to-be-costliest-disaster-in-canadian-history.
- Morrow, Adrian and Greg Keenan. 2016. "Climate plan will usher in a sea change." *The Globe and Mail*, May 16.
- Pauwelyn, Joost. 2012. "Carbon Leakage Measures and Border Tax Adjustments under WTO Law." Georgetown University Law Centre: Graduate Institute of International and Development Studies, March 21. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2026879.
- Risky Business Project. 2014. *Risky Business: The Economic Risks of Climate Change in the United States*. http://riskybusiness.org/site/assets/uploads/2015/09/RiskyBusiness_Report_WEB_09_08_14.pdf.
- Rivers, Nicholas. 2014. "The Case for a Carbon Tax in Canada." Canada 2020. November. <http://canada2020.ca/wp-content/uploads/2014/11/The-Case-for-a-Carbon-Tax-in-Canada.pdf>.
- Rubin, Jeff. 2016. *The Future of Canada's Oils Sands in Decarbonizing Global Economy*. CIGI Paper No. 94. March. Waterloo, ON: CIGI. www.cigionline.org/publications/future-of-canadas-oil-sands-decarbonizing-global-economy.
- Sawyer, David. 2013. "Carbon Exposed or Carbon Advantaged? Thinking About Competitiveness in Carbon-constrained Markets." Sustainable Prosperity Policy Brief. January. www.sustainableprosperity.ca/sites/default/files/publications/files/Carbon%20Exposed%20or%20Carbon%20Advantaged.pdf.
- Schwartz, Zane. 2016. "Did climate change contribute to the Fort McMurray fire?" *Maclean's*, May 4. www.macleans.ca/society/science/did-climate-change-contribute-to-the-fort-mcmurray-fire/.
- The Globe and Mail*. 2016. "Coming soon: Ontario's green energy fiasco, the sequel." *The Globe and Mail*, April 29. www.theglobeandmail.com/opinion/editorials/coming-soon-ontarios-green-energy-fiasco-the-sequel/article29801584/.

CIGI PUBLICATIONS

ADVANCING POLICY IDEAS AND DEBATE



China and Global Trade Governance

CIGI Paper No. 104
Alex He

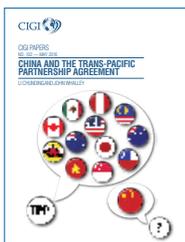
This paper explores policies, strategies and domestic factors that jointly determine China's participation in multilateral and regional trade regimes, based on an examination of the performance and roles China played in both the World Trade Organization and some of the regional trade agreement (RTA) negotiations since 2001. China's attitude and response to the Transatlantic Trade and Investment Partnership negotiations is a case in point that reflects its strategies, policies and domestic factors in RTAs and global trade governance. The case of China's negotiation in the Regional Comprehensive Economic Partnership represents another.



China and Global Energy Governance Under the G20 Framework

CIGI Paper No. 98
Alex He

This paper explores China's perspectives and practices in its quest for overseas energy supply security and its participation in international energy cooperation since becoming a net oil import country in 1993. It compares the traditional approach, in which China mainly focuses on bilateral means to pursue its overseas energy supply security, and the new concept of energy security, in which greater involvement in global energy governance, in particular in the Group of Twenty, is highlighted to promote China's energy security.



China and the Trans-Pacific Partnership Agreement

CIGI Paper No. 102
Li Chunding and John Whalley

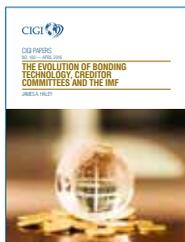
The Trans-Pacific Partnership (TPP) Agreement was concluded in October 2015, but still faces the challenge of ratification in each of the 12 member countries that are partners to the agreement. China, the world's second-largest economy, is not part of the TPP agreement, which has provoked a great deal of debate within China on the best strategy for it to take to deal with the TPP. This paper discusses China's possible trade strategy in light of the TPP.



Capital Flows to Emerging Market Economies: Feast or Famine Forever?

CIGI Paper No. 96
Malcolm D. Knight

Until the beginning of the new millennium, private capital flows to emerging market economies (EMEs) were mainly intermediated by large global banks, and EMEs were subjected to massive volatility in their external payments balances, exchange rates and domestic financial systems. But since the early 2000s, the role of bank-intermediated credit has declined, as the base of investors willing to take on exposure to emerging market corporate debt has become much larger and more diverse. These structural changes have encouraged vast growth in flows of funds, not only from the mature economies to EMEs as a group, but also among EMEs themselves.



The Evolution of Bonding Technology, Creditor Committees and the IMF

CIGI Paper No. 100
James A. Haley

This paper reviews a range of issues associated with proposals for creditor engagement clauses (CECs) in sovereign bond contracts. CECs have moved onto the international policy agenda in the wake of the recent introduction of model "second-generation" collective action clauses designed to address problems highlighted by the protracted litigation between Argentina and its holdout creditors.



The Future of Canada's Oil Sands in a Decarbonizing Global Economy

CIGI Paper No. 94
Jeff Rubin

Canadian Prime Minister Justin Trudeau and Alberta premier Rachel Notley have both argued that improving Canada's emissions record will safeguard the future development of the oil sands. The perspective offers little recognition of the current problems facing the country's largest energy resource, and even less recognition of the problems that the oil sands will encounter as a result of actions taken by other countries to limit their own carbon emissions as pledged recently at the twenty-first session of the Conference of the Parties to the United Nations Framework Convention on Climate Change.

Available as free downloads at www.cigionline.org

ABOUT CIGI

The Centre for International Governance Innovation is an independent, non-partisan think tank on international governance. Led by experienced practitioners and distinguished academics, CIGI supports research, forms networks, advances policy debate and generates ideas for multilateral governance improvements. Conducting an active agenda of research, events and publications, CIGI's interdisciplinary work includes collaboration with policy, business and academic communities around the world.

CIGI's current research programs focus on three themes: the global economy; global security & politics; and international law.

CIGI was founded in 2001 by Jim Balsillie, then co-CEO of Research In Motion (BlackBerry), and collaborates with and gratefully acknowledges support from a number of strategic partners, in particular the Government of Canada and the Government of Ontario.

Le CIGI a été fondé en 2001 par Jim Balsillie, qui était alors co-chef de la direction de Research In Motion (BlackBerry). Il collabore avec de nombreux partenaires stratégiques et exprime sa reconnaissance du soutien reçu de ceux-ci, notamment de l'appui reçu du gouvernement du Canada et de celui du gouvernement de l'Ontario.

For more information, please visit www.cigionline.org.

CIGI MASTHEAD

Executive

President	Rohinton P. Medhora
Director of the International Law Research Program	Oonagh Fitzgerald
Director of the Global Security & Politics Program	Fen Osler Hampson
Director of Human Resources	Susan Hirst
Director of the Global Economy Program	Domenico Lombardi
Chief of Staff and General Counsel	Aaron Shull
Director of Communications and Digital Media	Spencer Tripp

Publications

Managing Editor, Publications	Carol Bonnett
Senior Publications Editor	Jennifer Goyder
Publications Editor	Patricia Holmes
Publications Editor	Nicole Langlois
Publications Editor	Kristen Scott Ndiaye
Publications Editor	Lynn Schellenberg
Graphic Designer	Sara Moore
Graphic Designer	Melodie Wakefield

Communications

For media enquiries, please contact communications@cigionline.org.



67 Erb Street West
Waterloo, Ontario N2L 6C2, Canada
tel +1 519 885 2444 fax +1 519 885 5450
www.cigionline.org

