

Special

Climate change



Ice storms, flooding and forest fires are all expected to increase in frequency as our climate warms. According to Gregor Robinson, chief economist of the Insurance Bureau of Canada, catastrophic events cost Canadian insurers \$1.7 billion in the last year, and about \$1 billion in each of the two previous years. ISTOCKPHOTO.COM

Experts cite rise in extreme weather in call for climate change action

Looking back on 2012, the images of Hurricane Sandy's devastation may be the final, tragic note in a year in which extreme weather became impossible to ignore. Across Canada and around the world, record temperatures, flooding and drought show that – while too many North American policy leaders delay action on reducing fossil fuel use – the impacts of rising greenhouse gases continue to worsen. In fact, a recent report by reinsurer Munich Re concluded that the overall loss burden from weather catastrophes in North America between 1980 and 2011 was US\$1,060 billion (in 2011 values).

A recent report commissioned by the Insurance Bureau of Canada notes that weather extremes are increasing in frequency. Further, the climate will continue to warm for at least the

next 40 years, predicts the report, titled *Telling the Weather Story: Can Canada Manage the Storms Ahead?* “By 2050, the hot day that occurred once every 20 years over

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The Pembina Institute is a national non-profit think tank that advances clean energy solutions through research, education, consulting and advocacy. It provides policy research leadership and education on climate change, energy issues, green economics, energy efficiency and conservation, renewable energy, and environmental governance.

the past 30 years or so will occur about seven times more often,” says lead author Dr. Gordon McBean, a professor of geography at Western University and renowned climate scientist.

He notes that extreme weather takes a tremendous toll on human health as well as the economy. For example, more than 70,000 people died in the 2003 European heat wave. With a warmer climate and reduced precipitation over southern B.C. and Alberta, “we will see drought effects on crops, water supply systems and natural ecosystems. The occurrences of forest fires will increase by 50 per cent to more than 100 per cent in many sections of the boreal forest, as drier conditions and heat make forests more vulnerable,” says Prof. McBean.

The number of freezing rain events lasting more than four hours in the Ottawa-Montreal-

Quebec City region are predicted to increase by about 50 per cent by 2050. The cost of the Quebec ice storm of 1998 was estimated at between \$5 billion and \$7 billion, and it had a human impact as well. Researchers at McGill University found that children whose mothers experienced high stress during the storm scored lower on IQ and language performance tests than those whose mothers had less stress.

According to Gregor Robinson, chief economist of the Insurance Bureau of Canada, catastrophic events cost Canadian insurers \$1.7 billion in the last year, and about \$1 billion in each of the two previous years. “That’s a record.

ONLINE?

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We’ve never had three years over \$1 billion,” he stresses.

Mr. Robinson said in a statement that the bureau hopes its report “will act as a catalyst for governments, industry, communities and individuals to recognize the weather risks we are facing and to enter discussions about how to reduce their effects on Canadians’ lives and communities.”

Canada needs a national adaptation strategy while it works to reduce emissions, Prof. McBean says.

“We frequently hear that we only contribute about two per cent of the world’s greenhouse gas emissions, so it is not our fault,” he notes. “Yet our emissions per person are about 20 tonnes of CO₂ equivalent per person averaged over the country, and about 70 tonnes per person in Alberta and Saskatchewan, compared to about 10 tonnes or less in Europe and Japan and about three tonnes per person in China.”

Canada’s emissions have increased by 17 per cent since 1990, compared with increases of about seven per cent in the U.S. and three per cent in Norway. There was a 17 per cent reduction in the EU.

In the absence of policy change, the potential economic, human and environmental costs are expected to be enormous. A report published by the National Round Table on the Environment and the Economy, called *Paying the Price: The Economic Impacts of Climate Change for Canada*, concluded that “climate change costs for Canada could escalate from roughly \$5 billion per year in 2020 – less than 10 years away – to between \$21 billion and \$43 billion per year by the 2050s.”

This report was produced by RandallAnthony Communications Inc. (www.randallanthony.com) in conjunction with the advertising department of The Globe and Mail. Richard Deacon, National Business Development Manager, rdeacon@globeandmail.com.

Perspectives: Creating our energy future together



The debate around our energy future has never been as polarized as it is today. For Suncor, sustainable development guides our decision-making. We believe resources should be produced and used in ways that generate economic growth, create social benefits and minimize the impact on the environment. Our approach is to engage with a variety of stakeholders to help us see different perspectives. Together we can build the energy future we all desire.

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CLIMATE CHANGE

EXPERT OPINION

Looking west of the Rockies for a lesson in good climate policy



By **Matt Horne**
Director, Climate Change Program,
Pembina Institute

How much have you heard about British Columbia's carbon tax lately? If the answer is "nothing at all," then you're in good company. Whether it is the federal government's ongoing campaign against carbon taxes or the lack of discussion in other parts of the country, most Canadians hear very little about the fact that the country's west coast is home to one of the world's best climate policies.

If we're to do our fair share to fight global warming, this situation needs to change. B.C.'s policy can provide a starting point for

an adult conversation on climate change and the potential role that carbon taxes could play. In that spirit, here are a few notes on what B.C.'s experiment can offer the rest of the country.

B.C.'s carbon tax was implemented four years ago and by all accounts is accomplishing what it was intended to do – namely reducing greenhouse gas emissions as efficiently as possible. The tax makes it more expensive to burn fossil fuels such as coal or gasoline, adding about seven cents per litre at the pump. The higher prices encourage decisions that result in fewer fossil fuels being burned. All of the money collected from the tax (\$1.2 billion in 2012) is used to lower other taxes.

The tax is having the desired effect. While change didn't happen overnight, research shows that per capita demand for gasoline, diesel and the other petroleum products subject to the tax has dropped significantly since the

"Doomsday economic predictions have proven to be well off the mark. In fact, B.C.'s per capita gross domestic product has slightly outperformed the rest of Canada in the period since the carbon tax was implemented."

tax was implemented. Meanwhile, per capita use of the same fossil fuels has increased slightly throughout the rest of the country during the same period.

Local governments are seeing the tax tip the scales in favour of community projects that use renewable energy or reduce energy demand. Based on public opinion polling, just under half (47 per cent) of British Columbians have recently started driving less frequently. Of those, slightly more than half (51 per cent) did so to reduce the carbon tax they pay.

Doomsday economic predictions have proven to be well off the mark. In fact, B.C.'s per capita gross domestic product has slightly outperformed the rest of Canada in the period since the carbon tax was implemented. Many business leaders and economists, from B.C. and around the world, have praised the tax's design for its simplicity.

B.C.'s carbon tax also provides political lessons, and those may be among its most important. The policy survived the 2009 provincial election – an election that put carbon taxes on centre stage. Now, it looks set to survive a second election with both the government and opposition supporting the tax. With the \$1.2 billion it generates – about six per cent of provincial tax revenue – the carbon tax is becoming more and more entrenched within the province's fiscal framework, and in the psyche of British Columbians.

None of this is to say British Columbians and B.C. businesses are out in the streets celebrating the carbon tax, or that the province has figured out all of its climate challenges. For example, how government should invest carbon tax dollars remains a prominent debate: some suggest that the money should go toward projects that reduce pollution, while others believe that reducing other taxes makes the most sense.

At least that debate is happening in British Columbia. If our leaders in the rest of the country took the time to realize that the sky hasn't fallen west of the Rockies, maybe they would sound less like Chicken Little and more like leaders.

Matt Horne is director of the Pembina Institute's climate change program, and holds a master's degree in resource and environmental management from Simon Fraser University.

BY THE NUMBERS

37
Days per year in Toronto with temperatures over 30 degrees by mid-century¹

332
Consecutive months with a warmer than average global temperature²

60%
Percentage of U.S. farms located in drought-stricken regions in 2012³

3.41 million
Square kilometres of arctic ice on September 16, 2012 – the least amount of arctic ice coverage ever measured⁴

25%
Percentage of GDP that could be wiped out by catastrophic climate change⁵

\$2.3 trillion
Potential global investment in clean energy by 2020⁶

682,000
Canadians working in green jobs in 2010⁷

\$1.2 billion
Generated by British Columbia's carbon tax in 2012⁸

15.1%
Drop in per capita use of refined petroleum products in British Columbia since the carbon tax was implemented⁹

1. Insurance Bureau of Canada - Telling the weather story - Page 26.
2. National Climatic Data Center - <http://www.ncdc.noaa.gov/sotc/global/2012/10>.
3. U.S. Department of Agriculture - <http://www.ers.usda.gov/topics/in-the-news/us-drought-2012-farm-and-food-impacts.aspx>.
4. National Snow and Ice Data Centre - http://nsidc.org/news/press/20121002_MinimumPR.html.
5. NRTEE - Paying the Price - page 38.
6. Pew Environment Group - Global Clean Power - <http://www.pewenvironment.org/newsroom/reports/global-clean-power-a-23-trillion-opportunity-8589940389>.
7. ECO - Profile of Canadian Environmental Employment - <http://www.eco.ca/pdf/Profile-Of-Canadian-Environmental-Employment-ECO-Canada-2010.pdf>.
8. B.C. Fiscal Plan - 2012 budget documents.
9. Sustainable Prosperity - British Columbia's Carbon Tax Shift: The First Four Years - <http://www.sustainableprosperity.ca/article2864>.



B.C.'s carbon tax is a policy success that has resulted in lower carbon emissions without the negative impact on economic growth naysayers predicted. [ISTOCKPHOTO.COM](http://istockphoto.com)

POLICY

Clean technology critical to Canada's economy, environment

According to a recent release by Analytica Advisors, the clean tech sector employs 52,600 Canadians and has the potential to employ almost twice that many by 2020. It's an industry valued at \$10.6 billion today, potentially exceeding \$26 billion within five years.

On an international scale, the Pew Environment Group has identified clean energy as a US\$2.3 trillion opportunity. "Excluding R&D, the clean energy economy has grown over 600 per cent since 2004," says Phyllis Cuttino, director of the group's clean energy program.

In Canada, total private sector investment in clean energy was \$5.5 billion in 2011, 11th among G20 countries, with a five-year growth rate of about 22 per cent.

Clean energy is already the cheapest and best option in many regions of the world, Ms. Cuttino says. In the absence of the extensive energy infrastructure that exists in developed countries, it's much easier to adopt distributed generation, in the same way that cell phones were adopted over landline technology, says Ms. Cuttino. In addition to the domestic energy market, "there is a market

outside our borders if we want to manufacture and export," she adds.

Tom Rand, managing partner of the MaRS Cleantech Fund, agrees. "Countries will be either buyers or sellers of clean technology. The choices we make now will set that dynamic in motion for a generation."

Clean tech is currently an important part of Canada's economy, but its future potential outstrips that of many sectors, says Mr. Rand. "It's dominated by small and medium-sized enterprises. Collectively, they spend more on R&D than the entire oil and gas sector."

Clean tech is also far more likely to provide export-oriented, high-value jobs, he stresses.

Efforts by Export Development Canada and Sustainable Development Technology Canada are responsible for attracting a lot of private capital to the sector, says Mr. Rand. But more must be done, he adds. "There's a mistaken belief that somehow clean tech is supposed to succeed on its own, but if you think of the political support for the auto industry – building the highway system – or early military demand for the micro-



Clean tech is an important part of Canada's current economy, and its growth will outpace that of many other sectors. [ISTOCKPHOTO.COM](http://istockphoto.com)

chip, it's clear that every industry has had training wheels in the early stages."

The human and economic costs of extreme weather around the world are alerting leaders to the importance of moving beyond a carbon-based economy. The potential benefit from and need for clean energy are immense. "We need technology that solves this problem," says Mr. Rand. "We have

to replace coal, natural gas and oil, and we have to do it in less than a generation. It's the most important work we can do. Our business and political leaders aren't talking about it, so the public is lulled into a sense that there really isn't an emergency. But there is an emergency – it's just happening in slow motion."

Ms. Cuttino adds that effective policy decisions can enable or

hinder Canada's success in the economy of the future. "We have found that when countries around the world waver in their commitment to clean energy, investment falls away and goes elsewhere," she says. "When countries strengthen their goals and commitments, investment floods in. In each and every country, policy matters; investors are really looking for certainty."

Is your investment portfolio climate-proof?

Climate change poses significant risks to investors. The Pembina Institute is helping financial institutions and investors navigate those risks and capitalize on the benefits of the low-carbon economy. Ask us how.

EXPERT OPINION

Will Ontario's energy plan cope with climate change and achieve prosperity?



By Don MacKinnon,
President, Power Workers' Union

Hurricane Sandy has put climate change back in the public spotlight. Days before this powerful storm, the final climate change report from Canada's National Round Table on the Environment and the Economy (NRTEE) declared that our collective challenge "is not just about coping with climate change, but prospering through it." With some fine-tuning, Ontario's energy plan could do more of both.

A recent report prepared for the Canadian Nuclear Association indicated that Ontario's nuclear investments can help sustain Canada's multi-billion-dollar nuclear industry and its 60,000 direct and indirect jobs (most of which are in the province), while driving an estimated 40 per cent growth in its Canada-wide employment levels over the next five years.

Natural gas generation is being used to replace coal generation for peak needs and, although the price is volatile, it can technically fill that role and with lower carbon emissions. However, natural gas generation is also planned to provide backup for intermittent wind and solar generation, and they require backup power over 70 per cent of the time. An unintended consequence could well be a net increase in Ontario's electricity generation from carbon-emitting fossil fuels.

As the Environment Commissioner's 2011 *Greenhouse Gas Progress Report* indicated, even with the coal station closures, this shift to natural gas generation compromises Ontario's ability to meet its 2014 and 2020 greenhouse gas (GHG) targets. And now Ontario is more dependent on imported natural gas, including environmentally questionable U.S. shale gas.

Families and businesses are seeing Ontario's electricity prices on the way to being among the highest in North America. Consumers are receiving a Clean Energy Benefit to hide the sticker shock with money that taxpayers must repay in the future. Meanwhile, Ontario's industries are receiving electricity subsidies to keep them competitive.

Regrettably, no final price tag for these investments in wind, solar and natural gas generation is known. These include the costs of: new enabling transmission and distribution lines; smart control technologies; and new operating procedures. Additionally, hundreds of millions of dollars in compensation will be paid to private developers for two cancelled, then relocated, natural gas plants. Big multinational wind, solar and natural gas developers are the real winners.

Ontario's energy plan does recognize that low-carbon hydroelectric, nuclear and biomass generation must play a critical role in meeting the province's future electricity needs. Investments are being made to renew existing hydroelectric facilities and to develop Ontario's remaining hydropower potential. As well, the plan calls for the mid-life refurbishments of the province's nuclear fleet and the construction of two new nuclear reactors at Darlington.

These are important investments since GHG emission-free nuclear energy provides about half of Ontario's electricity and 3,000 megawatts of that will disappear in 2020 when the Pickering Nuclear Station is scheduled to close. The economic stakes are also high. A recent report prepared for the Canadian Nuclear Association indicated that Ontario's nuclear investments can help sustain Canada's multi-billion-dollar nuclear industry and its 60,000 direct and indirect jobs (most of which are in the province),

while driving an estimated 40 per cent growth in its Canada-wide employment levels over the next five years.

However, some challenging obstacles stand in the way: Ontario must select "Made-in-Canada" Enhanced CANDU 6 technology for the new reactors and take steps to improve Ontario Power Generation's

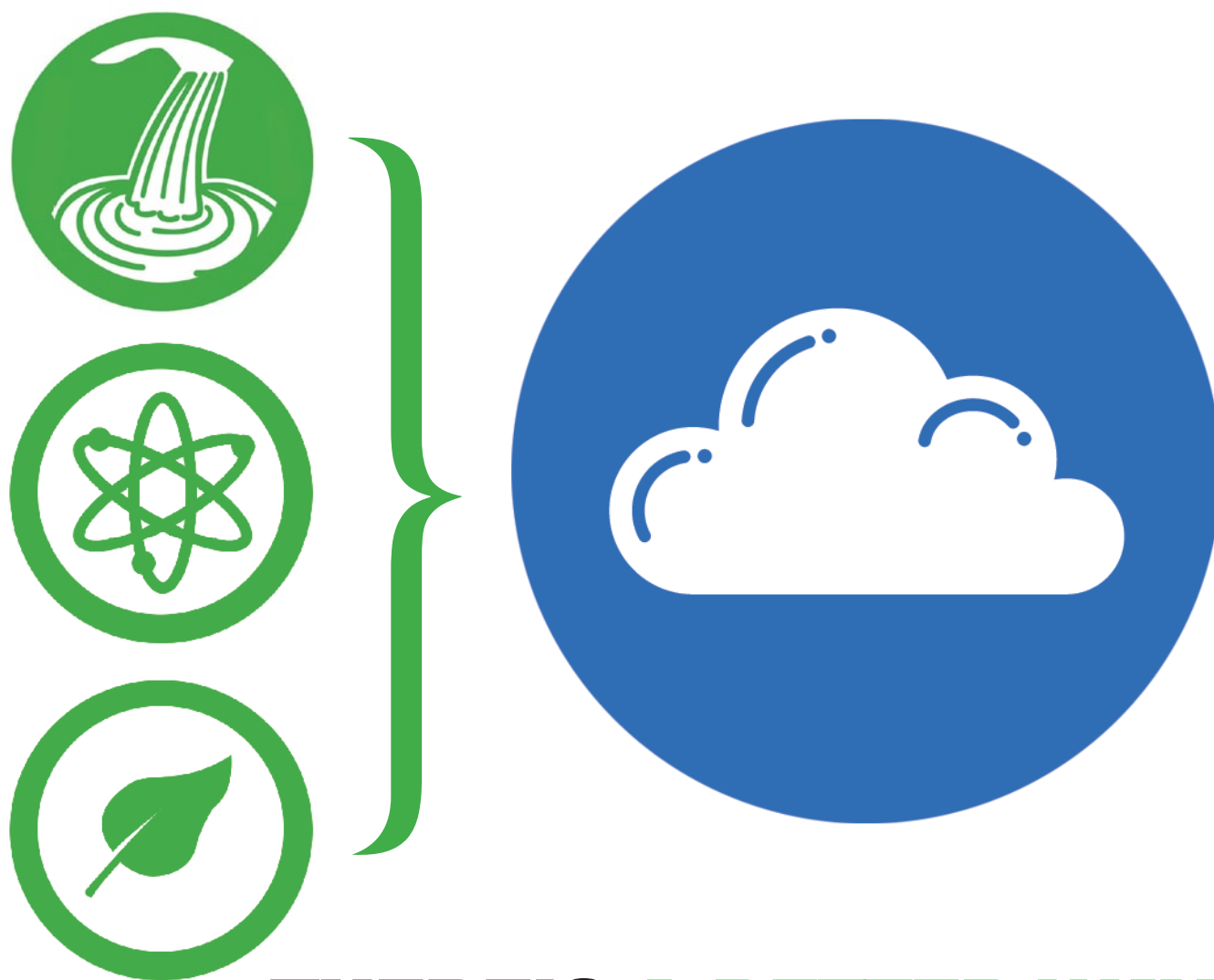
(OPG) financial capability to build these new reactors. OPG receives almost 70 per cent less (cents/kilowatt hour) for the electricity it generates compared to private-sector generators. As well, the province must engage the federal government's help in securing project financing.

Further GHG reductions and more jobs and economic

benefits could be achieved by converting Ontario's existing coal stations to domestically sourced, renewable carbon-neutral biomass along with natural gas. Investments in biomass fuel supply chain infrastructure are estimated to create about 3,500 jobs and contribute about \$600 million annually to Ontario's GDP. As

well, valuable and already paid for publically owned generation and transmission assets would be recycled.

We need leadership that recognizes these benefits and leverages Ontario's natural advantages to better manage climate change while generating economic wealth for all Ontarians.



THERE'S A BETTER WAY FOR ONTARIO TO REDUCE GREENHOUSE GAS EMISSIONS AND GROW OUR ECONOMY

What does spending billions for more intermittent wind and solar power backed up by price volatile, carbon-emitting, import dependent natural gas plants deliver?

- Electricity prices on their way to being among the highest in North America
- Higher greenhouse gas emissions
- Huge ratepayer subsidies that benefit big multi-national corporations
- Less energy security, and
- An unnecessarily troubled economy.

Ontario's natural energy advantages – our hydroelectric and CANDU nuclear fleets – currently provide an electricity system with one of the lowest carbon footprints in the world.

Refurbishing these assets and building more is the best way to ensure clean, affordable, reliable, secure electricity for the future.

Converting Ontario's existing coal generating stations to use domestically sourced, renewable, carbon neutral biomass along with natural gas for peak needs would make it even better.

This supports Ontario industries, recycles provincially owned assets, and creates more high value jobs and economic wealth.

Ontario needs leadership that makes smart investments in our natural advantages. It's a better way to tackle climate change and create economic wealth.

For more information please go to www.abetterenergyplan.ca.

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KEEP THE LIGHTS ON**

