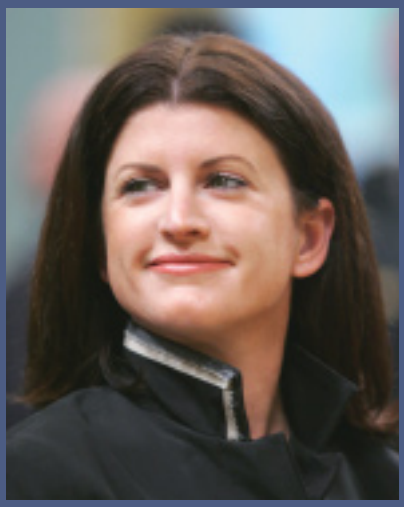
REDUCING GREENHOUSE GAS EMISSIONS: SOME CANADIAN SUCCESS STORIES

Karen Kun and Toby Heaps



Industry's response to the challenge of global warming is by no means all doom and gloom. Karen Kun and Toby Heaps of *Corporate Knights* magazine consider several outstanding Canadian examples of companies that have reduced their greenhouse gas emissions to well below 1990 levels, all of them in industries known to be serious emitters. Catalyst Paper in British Columbia has reduced its GHG emissions by two-thirds. Alcan, in aluminum, is another success story, as is EnCana, in one part of the oil patch — the world's largest GHG sequestration project, at Weyburn, Saskatchewan. Read on.

Le pessimisme n'est pas vraiment de mise face à la réaction de la grande industrie au réchauffement planétaire. C'est ce qu'avancent Karen Kun et Toby Heaps, de la revue *Corporate Knights*, qui recensent plusieurs cas exemplaires d'entreprises canadiennes ayant réduit leurs émissions de gaz à effet de serre (GES) bien au-dessous des niveaux de 1990, toutes appartenant à des secteurs très polluants. En Colombie-Britannique, Catalyst Paper a réduit ses émissions des deux tiers, et le géant de l'aluminium Alcan affiche en la matière un excellent bilan. Tout comme EnCana, qui mène dans une partie du champ de pétrole de Weyburn, en Saskatchewan, le plus grand projet de retenue des GES au monde.

Wayne Gretzky skated not to where the puck was, but to where it was going to be. That same sense of foresight drives a surprising number of Canada's billion-dollar companies to take aggressive action on greenhouse gas emissions (GHGs), despite the lack of a federal policy for most of the past decade. Many of these pioneers are counting on, and openly asking for, a clear policy mix of short- and long-term targets with fiscal incentives for reducing GHGs. It's important that the federal government not make these corporations look bad for being early leaders in coming up with solutions for our climate change conundrum — otherwise the government would have to fill the policy vacuum.

This article highlights some of Canada's leading corporate success stories on the greenhouse gas reduction front, shows why companies are taking action now and explains what government can do to reinforce and promote more of this type of behaviour.

In December 2005, while Canada was hosting the meeting of the parties to the Kyoto Protocol in Montreal, *Business Week* magazine named Catalyst Paper Corporation of British Columbia one of the decade's top 10 corporations in the world, based on total reduction of GHGs (results relative to company revenues) and management's leadership on environmental issues.

Since 1990, Catalyst Paper, one of Canada's largest newsprint and specialty paper manufacturers, with annual sales of $1.86 billion, has slashed its direct CO_2 equivalent emissions (another term for GHGs) by 1 million tonnes from 1,383,000 kg to a 2005 level of 398,000 kg. Over the same period, the company also reports it has improved its carbon intensity (CO_2 equivalent emissions per tonne of paper) by 71 percent, from 574 kg to 166 kg.

This massive reduction was achieved by three initiatives: switching from fossil fuels to biomass; efficiency measures such as retiring old, inefficient wood waste boilers; and tracking GHGs monthly so everyone stays on top of the carbon file.

Catalyst Paper is BC Hydro's largest customer, spending about $150 million per year on electricity, but it has reduced its fossil fuel use by 46 percent since 2002 by burning biomass it already possesses (bark, wood shavings, sawdust and black liquor) as a replacement for fuel that would have cost millions of dollars. To help the wood waste burn more efficiently, the company mixes it with low-sulphur coal

or tire derived fuel in some cases. In September 2005, the company's Powell River and Port Alberni mills received eco-logo certification for 51 MW of biomass electricity, opening the door for Catalyst Paper to market "carbon-neutral" paper grades for customers sensitive to the climate change issue.

With milder winters making it possible for the wood-ravaging pine beetle to flourish in BC, Catalyst Paper also has a dog in the fight against climate change. As the company puts it: "Catalyst Paper's operations are all subject to the availability of wood fibre. Climate change models predict long-term warming, which will impact species of trees growing on the coast, and continue to foster the mountain pine beetle attack on British Columbian forests."

Beyond having an interest in the fight against the pine beetle and the reputational benefits of being a "green" company, Catalyst Paper's main motivation to accomplish the one-million-tonne challenge is credible but crass: to save millions of dollars on fuel now and hopefully cash in on millions of dollars of carbon credits in the near future. "It [reducing GHG emissions] is a sensible business strategy that delivers cost savings and environmental benefits," according to Russell Horner, the company's chief executive.

As Catalyst Paper wrote in its 2006 submission to the Carbon Disclosure Project (a transparency initiative backed by investors with US$31 trillion in assets), "Climate change is a threat to those paper manufacturers who have not improved their performance and will be required to purchase offsets or spend value capital to control emissions." Catalyst Paper, on the other hand, will likely receive 400,000 tonnes of CO_2 equivalent credits annually, which it can sell on the market for about $6 million, based on a price of $15 per tonne (the previous federal government's apparent cap for large final emitters).

Alcan Inc., the Montreal-headquartered aluminum giant with US$20.4 billion in annual revenues, is another company that has axed its GHG emissions.

Aluminum smelting is one of the most prodigiously polluting activities imaginable. It takes a motherlode of electricity to make the lightweight metal. Alcan used 281 million GJ of electricity at its combined global operations in 2005, or about half as much as the entire province of Ontario. But the GHGs associated with the electricity used to smelt aluminum are only 70 percent of the equation. The other GHGs come from the actual aluminum smelting process, which releases both CO_2 and — now significantly diminished but still potent — perfluorocarbons (PFCs). Despite the huge GHG profile of the industry, Alcan has found a way to cut back in the short term while positioning itself to be a provider of GHG solutions in the long term.

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In the words of Alcan's recently retired CEO, Travis Engen: "Some asset-intensive industries are making investments now that have a 30- to 50-year horizon. As CEO, I wanted to make damn sure my investments were good for the future, not just today." For Alcan, which has 88 percent of its operations in Annex B countries (Kyoto signatories that have promised mandatory GHG reductions), this means considering investments in light of how much the company will have to pay to emit carbon. Alcan's new CEO, Dick Evans, has expressed a similar outlook. He said: "Whether you agree or disagree with global warming, there are clearly now enough scientists and other opinion leaders who do agree that it is already having a major impact on our industry. The point [regarding] GHGs is not that discontinuous change is guaranteed to happen…but that enough good minds believe that it is likely to happen that the payoff is present today to work on it."

Alcan has knocked down its Canadian absolute GHGs by 30 percent since 1990, while increasing production by 50 percent. Globally, the company has reduced total GHG emissions from smelting by 25 percent while ramping up production by 35 percent (see the article by Alcan's Daniel Gagnier). The secret to Alcan's success in GHG reduction has been putting the squeeze on PFCs, which are 6,500 times more potent than carbon dioxide. PFCs are a sort of accidental emission that can occur during the aluminum smelting process during brief upset conditions known as "anode effects," which happen when the level of dissolved aluminum oxide in the cell drops too low.

Although PFCs accounted for about half of all GHG emissions from aluminum smelting as recently as 20 years ago, they were not really on anybody's radar because they were not a controlled substance. Since 1990, Alcan has cut its PFCs from 5.5 kg CO_2

equivalent per tonne of aluminum to 1.1 kg CO_2 equivalent per tonne — an 80 percent improvement — simply by updating its smelting technology. These actions are saving the company substantial energy costs as well. At plants like Alcan Primary Metal-

EnCana Corporation, the $42-billion natural gas powerhouse creation of Gwyn Morgan (who hails from Carstairs, Alberta, where "even the grass grows to the right"), is not the most likely candidate for GHG reduction leader — especially considering the firm does not even mention the words "climate change" in its 2005 Responsibility Report. But sometimes Albertans walk softly and carry a big stick. What started out as a way to extract more oil from an old Weyburn oilfield by injecting CO_2 to push it out has now turned a sleepy 70-square-mile-section of southeastern Saskatchewan into the world's largest GHG sequestration project.

British Columbia or Usine Arvida, the company still has dinosaur smelting technology in place, which in turn explains why over 60 percent of the two plants' CO_2 equivalent emissions — amounting to over 1.6 million tonnes — still come from PFCs. The best-of-class smelting technology that Alcan now possesses through its acquisition of Pechiney in late 2003 virtually eliminates PFCs from the smelting process, emitting a scant 0.02 kg of PFCs per tonne of aluminum. Because it saves energy as well, this "zero anode" technology has captured a dominant position, with 18 percent of the world aluminum smelting market by volume.

In the longer term, Alcan is positioning aluminum as the material industry's answer to climate change (DuPont is doing the same with advanced plastics). On a lifecycle basis, the company claims in its submission to the Carbon Disclosure Project that "it is possible to foresee that with increased penetration of aluminum into these [transportation sector] markets, it would some day be possible to claim that the aluminum industry is climate-neutral." According to Alcan, over the product lifespan, "lightweighting," by replacing steel parts with aluminum parts (which weigh half as much), gives GHG savings of 22 kg CO_2 equivalent emissions in automobiles per kilogram of weight reduction, 100 kg CO_2 equivalent emissions in ships, 55 kg CO_2 equivalent emissions in short-distance trucks and urban buses, 20 kg CO_2 equivalent emissions in long-distance trucks and buses, 80 kg CO_2 equivalent emissions in short-distance trains, subways and trams, and 48 kg CO_2 equivalent emissions in long-distance trains. Alcan also says that the use of lightweight aluminum components in a vehicle can save 6 to 12 times the energy taken to produce the primary aluminum used in the vehicle's construction. On this account, some big orders have come Alcan's way, including the Airbus 380.

The solar cooker is another area that Alcan is staking out. Right now, about 2 billion people in developing countries use a wood stove. About 20 years ago, people in these countries started using solar cookers. Today, there are some half a million solar cookers serving about 5 million people in 80 different countries. Each solar cooker saves roughly 3.5 tonnes of CO_2 equivalent emissions per year compared with a wood-burning stove. Alcan's Solar Surface products have developed a weather-resistant bright aluminum sheet, which the company is peddling to boost its market share in the developing country home-cooking segment. It is a staggering statistic to consider, but if a little less than half, or 100 million wood stoves, were replaced by solar cookers, it would amount to an annual GHG reduction of 350 million tonnes — 10 times Alcan's annual GHG emissions, or about half of Canada's total GHG emissions of 758 million tonnes in 2004.

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Since 2003, EnCana has injected about 5 million tonnes of CO_2 into its 50-year-old Weyburn, Saskatchewan, oil field that would otherwise have been vented from a North Dakota coal gasification plant. EnCana plans to inject 30 million tonnes of CO_2 at Weyburn over a 30-year period (equivalent to taking 6.7 million cars off the road for one year). The Weyburn sequestration project, conducted under the auspices of the International Energy Agency, led international scientists to conclude that geological storage of CO_2 can be safe, estimating that 99.8 percent of the CO_2 stored in the Weyburn field will remain underground for at least 5,000 years.

Although carbon sequestration has several limitations (it's not economic in most cases and there's the issue of who bears the long-term liability of storing carbon underground for millennia) that prevent it from being a silver bullet solution to climate change, it

Courtesy, Catalyst Paper Corporation

The Catalyst Paper Corporation's plant at Powell River, BC. Since 1990, the company has slashed its CO_2 equivalent emissions by about two-thirds and cut its carbon intensity emissions by 71 percent. It's a significant Canadian success story.

could still be a useful "arrow in the quiver," in the words of the Pembina Institute. For instance, if EnCana were allowed to count all of the carbon that it had sequestered at its Weyburn site in 2005 against its total direct emissions, it would have reduced its total GHG emissions by 34 percent from 5.5 million tonnes to 3.6 million. As part of a portfolio of dealing with the climate change challenge, the carbon sequestration technology pioneered by EnCana's Weyburn operation offers considerable promise in western Canada as many large-scale CO_2 emitters are located within 500 km of suitable geologic sequestration sites.

EnCana's recently promoted chief executive, Randy Eresman, is keen to tackle GHG emissions head on. "The key to reducing greenhouse gas emissions is innovative thinking and technology – either through improving the efficiency of our operations, storing carbon dioxide, or developing renewable energy sources," he says. In its 2005 submission to the Carbon Disclosure Project, EnCana even referred to its main product, natural gas, as a "cleaner burning *transition* [emphasis added] fuel."

Although it's a small part of the company's overall multi-billion-dollar investment portfolio, EnCana has initiated an Environmental

Innovation Fund that has invested $3 million into a Tidal Power Demonstration Project at Race Rocks off Vancouver Island. The fund enables the marine park to tap into surrounding ocean currents and convert tidal energy to electric power.

All three companies mentioned have made considerable investments preparing for a low-carbon economy, offering a glimpse into what kind of action could be leveraged all across the private sector if only policy uncertainty was not in such abundance. In the absence of clear leadership from the federal government, GHG emissions management remains on the back burner for most of Canada's largest emitters.

According to Deloitte's 2006 GHG Emissions Management Survey of 220 large Canadian GHG emitters, 80 percent ranked GHG emissions management as an issue of moderate to critical importance, but half of those companies do not include GHG emissions management in their overall risk management. The dominant driver for companies to reduce GHGs was "anticipated government regulation," by a two-to-one margin over "energy/cost effectiveness."

Not surprisingly, the companies that have taken the most action to improve their carbon profile are also the companies most loudly urging governments to get their act together and set some clear parameters for them to plan around. The Executive Forum on Climate Change — a cross-section of Canadian CEOs including the bosses of Catalyst Paper, Alcan, Shell Canada and Power Corporation — issued an unheeded call to then Prime Minister Paul Martin in November 2005: "To help us do more, we need policy certainty for post-2012. We need a strategy now for the next 50 years, with short- and medium-term targets to guide us. Governments must set clear markers along the way to unleash competitive market forces and allow the discovery of a long-term value for carbon emission reductions. Only then will we secure the deep reductions needed to prevent human interference with the climate system."

The CEOs also asked the prime minister to break open fiscal tools, including tax incentives, recommending that Canada, while respecting provincial authority, "set objectives to meet global best practice for energy production and consumption through regulated standards, procurement, financial and tax incentives and market-based approaches like emissions trading and trading of energy efficiency credits."

These clarion calls from industry's climate leaders for more policy certainty have been echoing in beltway corridors, in Brussels and at 10 Downing Street as well.

So what is the most effective economic instrument for leveraging the power of business to responsibly reduce the economy's carbon profile? In a July 2006 survey, GlobeScan put that question to its Climate Forum, consisting of sustainability experts and climate change solution providers. The consensus? A carbon tax will be the most effective tool. Eight in 10 said that taxes on GHG emissions, including fuel taxes based on carbon emissions, will be an effective approach to lessening climate change. Seven in 10 also cited emissions trading as an effective device.

Interestingly, the only Kyoto signatory on track to meeting its obligations in a sustainable way is Sweden, which has implemented a nuanced but effective "carbon tax" as the bedrock to its GHG policy suite. When levying the carbon tax, the Swedish government considers who can pay, who cannot and who is liable to flee. Consumers and profitable sectors that are strongly rooted in the country can pay and are levied carbon taxes accordingly. Extremely fleet-of-foot sectors or industries on the brink of bankruptcy are given slack on the carbon tax, so as not to drive business away or out of business. The result is that Sweden, a fellow northern climate — albeit one without the oil sands — has reduced its GHGs by 2 percent since 1990.

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Quebec premier Jean Charest is taking Sweden's lead on the carbon tax, and while it is hard to say if his nascent policy has generated GHG reductions in Quebec, it has certainly built political capital, if polls are to be trusted.

Canada is the emerging energy superpower of the world and the stakes of an imminent carbon-constrained economy loom large. Amid exploding energy exports, Canada has the wealth and innovation capacity, as demonstrated by many corporate leaders, to make Canada the cleanest, most energy-efficient economy in the world. Now is the time to lay the framework and to shoot at the net.

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