

You can argue the science, but there's no avoiding the reality - a rapid, environmental transformation is sweeping the planet. Since 1990, the world has logged the warmest 10 years on record. By the middle of this century, rising temperatures are predicted to trigger an irreversible melting of the Greenland ice cap, the flooding of lowlands worldwide, and the occurrences of other environmental catastrophes that will affect all forms of life on the planet. ■ In Canada, the early effects of climate change are clear - among them, heat-induced stress in Canada's forests, storm surges on our coasts, the rapid recession of monumental glaciers and the decline of the polar north as we know it. And this is just the beginning. ■ What are Canadians doing about it? Not enough.

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GLOBAL WARNING

BY RANDALL ANTHONY MANG

Today marks the second anniversary of Canada's ratification of the Kyoto Protocol, the significance of which ballooned earlier this year when Russia joined the international agreement, bringing Kyoto into force on February 16, 2005, and ushering in a new world reality that places a moral and economic value on greenhouse gas (GHG) emissions.

While the protocol sets binding emission targets for developed countries to reduce their emissions on average 5.2 per cent below 1990 levels by 2012, it is just the beginning.

Environment Minister Stéphane Dion is among those who have acknowledged that Kyoto's initial emission targets are just the start.

A recent Globe and Mail report citing the minister stated, "Over the next 50 years or so, he said, total global emissions must fall to 70 per cent below 1990 levels."

"We know that this is a challenge for Canada; it is a challenge for many countries," said Mr. Dion.

While Canada and other nations begin to grapple with Kyoto compliance, others such as the U.K., the Netherlands, Germany and Scandinavia are forging ahead with policy action, aggressive deployment of clean energy technologies and other market-based measures to combat GHG emissions.

The U.K., for example, in addition to committing to a GHG reduction target of 20 per cent by 2010, reduced its GHG emissions by 15 per cent between 1990 and 2002, while its economy grew by 36 per cent. Now, as the U.K. assumes the G8 presidency for 2005, Tony Blair has put climate change at the top of the G8's agenda. "Kyoto is only the first step but provides a solid foundation for the

next stage of climate diplomacy," said Mr. Blair recently.

John Wiebe, president and CEO of environmental business consultancy the GLOBE Foundation of Canada, said, "In Asia, Japan is moving ahead, and I believe that there will also be movement in China and India, because multinationals will implement technologies and efficiencies there as they do elsewhere in the world."

In addition to helping mitigate man's impact on the planet, Dr. Wiebe says this activity is producing another welcome outcome - business.

"Everyone will now be looking for solutions to help reduce their carbon footprint," said Dr. Wiebe. "The degree of commitment that governments express through regulations, investments, incentives,

and other mechanisms, including the request for voluntary emissions reductions, will directly affect demand for technology solutions, finance, consulting - business right across the board. How deep it goes, however, depends on political will."

To its credit, the federal government has in recent years launched a spate of programs to spur clean technologies such as hydrogen and fuel cells, ethanol and wind energy.

According to Matthew Bramley, the director of the climate change program at the Pembina Institute, an environmental policy research and education organization, Canada's political will, however, has been woefully lacking, a factor that has resulted in Canada recently emerging with the worst per capita record for emissions of

G7 countries.

"Voluntary measures failed," he said. "Between 1990 and 2002, when Canada's governments were relying on the voluntary approach, emissions rose 35 per cent from electricity generation, 47 per cent from oil and gas, while total emissions rose by 20 per cent."

Information provided by the federal government this week sends a strong signal that Ottawa is prepared to address Canada's toughest climate change-related issues.

"For Canada, the big decisions to be made include how it will implement an emissions reduction system for 'large final emitters'; how to move forward on implementing vehicle fuel efficiency improvements; key new large-scale measures to achieve emissions reductions in the Kyoto time-

frame as well as the medium and longer term; and a plan on science and adaptation."

Dr. Bramley says that Russia's ratification has put pressure on all developed nations. "Canada needs to be 6 per cent below its 1990 GHG emissions levels, but today we are 20 per cent above," he said.

He urges Canada to implement all 33 policy commitments set out in Canada's Climate Change Plan, each of which has a specific emissions reduction target. "It's not a menu," he said. "The government must implement all of them."

Dr. Bramley is particularly interested to learn how Canada plans to deal with large final emitters - industrial facilities that account for nearly half Canada's GHG emissions. "Federal officials have been designing a regime of mandatory

targets for these emitters, but ministers have still not yet given the green light. The legislation urgently needs to be introduced."

Despite a lack of federal direction, a handful of major companies such as TransAlta, DuPont, Shell Canada and others have moved forward with aggressive voluntary measures, motivated as much by competitiveness as social conscience.

Tim Bancroft, vice president of Sustainable Development at Shell Canada said, "As a global energy company, a producer of fossil fuels, we feel we have a responsibility to take action."

Through its early measures, Shell Canada is now well on its way to reducing its emissions to 6 per cent below its 1990 levels by 2008 for its Oil Products and Exploration and Production businesses. Shell has also committed to making its new oil sands business less GHG-intensive than alternative sources of imported crude oil.

The company has accomplished its goals through a blend of energy conservation and other activities, including its investments in "emissions offsets" such as tree-planting initiatives, clean energy and pollution control technologies.

While Dr. Bramley applauds the work of companies like Shell, he urges the federal government to mandate GHG targets and create a national energy strategy that, as in the U.K., will have climate policy "at its heart."

And the environment? "What's going to happen to the climate 20 years from now is already predetermined," said Dr. Wiebe. "That's why the need for action today is so critical; the environmental improvements we're trying to effect won't be realized for 50 to 100 years." ■

See: **Feds face climate change**, E6



PHOTO: TONY CALDWELL

Matthew Bramley of environmental policy research and education organization, the Pembina Institute, is encouraged by recent indications from the federal government that suggest Ottawa may be preparing to step up action on climate change.

Facts on climate change alarming

BY GRANT WING

A landmark international scientific study of Arctic climate change confirms the Arctic is warming more rapidly than the rest of the globe and strengthens the link between climate change and greenhouse gases from human activ-

ity. The Arctic Climate Impact Assessment (ACIA), which projects global climate disruption, reinforces the urgency of mitigating and adapting to global warming.

The ACIA's findings and projected impacts are based on observed data and a moderate scenario of future warming, not a

worst-case scenario.

Among its findings, the report describes the Arctic as particularly vulnerable to human-induced climate change and an early indicator for global warming. In addition, it says the rapidly warming Arctic will

See **Facts** E2

Canada's green advantage

DAVID B. LAYZELL

CEO and Research Director,
BIOCAP Canada Foundation

For humans, the dilemma of how to slow climate change while still producing the energy we need has become the

nail-biter of our times. For plants, the solution to the quandary has been nothing more than daily business for the past 400 million years.

Plants sop up the main heat-trapping gas responsible for climate change. In the metabolic act of capturing the sun's energy, they absorb and store carbon dioxide even as it

is dumped back into the air when plants and other living things breathe or rot or burn.

Indeed, plants were doing a good job of balancing this natural CO₂-in-CO₂-out cycle until we came along. Our smokestacks and

See **Green advantage** E2

INSIDE:

TRADING PLACES

Emissions trading is up, but trading by Canada has declined. E4



THE BIG THAW

Canada's melting Arctic is the symbolic canary in the coalmine. E2

GREEN ENVY

Canada's support for sustainable energy is noble, but lagging. E5

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SIR DAVID KING, CHIEF SCIENTIFIC ADVISER TO U.K. GOVERNMENT

Arctic meltdown signals need for action

DAVID SUZUKI

Living in the frozen Arctic, Canada's Inuit may seem like the last people on Earth who would be concerned about global warming. A little heat couldn't hurt, right? But climate change actually threatens the entire Arctic ecosystem and the Inuit way of life.

Climate change is happening sooner and faster in the Arctic than in any other part of the globe. While the Arctic is home to an array of plants, animals and people that survive in some of the most extreme conditions on the planet, its isolation and sheer vastness make it easy to ignore.

A new report solidifies what scientists have predicted for years – that Canada's Arctic is the symbolic canary in the coalmine, an early warning of what is in store for the rest of the world. For the past four years, 250 scientists from 15 countries have examined climate change in the Arctic. The resulting Arctic Climate Impact Assessment shows that changes are already underway



and shows that temperatures in the Arctic are rising at twice the global average.

Widespread melting of glaciers and sea ice, rising permafrost temperatures, and a shortening of the snow season are already underway. The result will be the extinction of iconic species like polar bears and the destruction of the Inuit as a hunting culture.

At risk is everything from the algae that live on the underside of sea ice, to the polar bears that hunt

on top of that ice, to the Inuit who live there. It's more than just an ecosystem – it's the way of life of an entire people. And it threatens our Canadian identity as a northern nation.

The Arctic report paints a grim picture, but there is reason for hope. The report says the best way to slow climate change is to cut our greenhouse gas emissions. The good news is that the Kyoto Protocol finally comes into force in February. For Canada, that means we will have a legal obligation to reduce our greenhouse gas emissions to 6 per cent below 1990 levels. That's not much. Many scientists say that to stabilize our climate, we'll have to reduce those emissions by 60 per cent.

Still, it's a start. Meeting our Kyoto targets will encourage innovation in the renewable energy and conservation sectors. That means more jobs. It also means cleaner air and less health-care costs because we'll be burning less fossil fuels. It's an opportunity to change the way we produce and consume energy in

a way that will improve our quality of life.

The bad news is that the Canadian government has stalled on its Kyoto commitment. Our federal government has yet to take advantage of the opportunities Kyoto presents to foster a cleaner, more efficient and innovative economy.

That inaction has caused Canada's emissions to rise nearly 20 per cent above 1990 levels, and still there is no clear plan on how Canada will achieve our targets.

It is time to be decisive. It is time to lead, time to start doing things differently, and time that the federal government and the provinces create a program with targets and timelines to reduce Canada's greenhouse gas emissions.

The Arctic and the people, plants and animals that live there are central to our identity as Canadians. What would Canada be without our polar bears and untouched wilderness? But it is not just the Arctic that is at risk. It is a symbol that the whole country, the very planet itself, is imperilled. ■

Green advantage

From E1

tailpipes and our penchant for clearing forests have sent more of the gas skyward while less of it is sponged up again by plants. The cycle has become top-heavy.

The climate role played by plants is as old as life itself, but it is often ignored in modern efforts to stem climate change. Canada, in particular, should look again.

Canada is green. It has 10 per cent of the Earth's forests and some 68 million hectares of farm land. Just half a per cent of the planet's population lives here. While Canadians generate more greenhouse gases per capita than almost anyone else, the total is small (a tenth or less) compared to the amount of CO₂ that cycles naturally between our vast landscape and the atmosphere. Meanwhile, every turn of this so-called carbon cycle captures and releases energy from the sun.

It all adds up to an opportunity to tap into and manage this cycle, lowering greenhouse gases while appeasing our appetite for energy. In Canada, where millions of hectares of green space make the carbon cycle so relatively huge, our biological resources are our advantage.

As a concept, this one is not only in the right place, it is at the right time. Scientific and technological advances mean we can convert wood, crop remains and waste into energy. (Existing farm, forestry and city waste alone contains energy equal to a quarter of what Canada now gets from fossil fuels.) Developments in biology and resource management mean we can grow more trees and plants faster on

available land.

The challenge is that despite the lumbering size of Canada's terrestrial carbon cycle (moving 2 to 3 billion tonnes of CO₂ in and out of the atmosphere each year), balancing it while using it to meet new environmental, economic and social needs is delicate work.

For instance, every tree or plant we use for energy or fuel means one less tree to absorb CO₂ – fewer to offset our greenhouse gas emissions. Harvesting more of the leftover organic material could also reduce soil nutrients and animal habitat.

On the other hand, leaving or encouraging trees to do their CO₂ storage work may mean that aging forests and deadwood encourage insects or fires that release both the plant-trapped energy and the stored carbon.

One solution might involve growing new energy-rich crops on farm land while helping our large, biodiversity-rich forests to thrive. The nation's biological resources – these crops and the dead material from forests – could become the energy base for a climate-friendly economy.

But how do we get there? What are the costs and benefits? Through its funding and stewardship of 11 national research networks in fields as varied as science, social science, economics and technology, the BIOCAP Canada Foundation (www.biocap.ca) is looking for answers.

Plants have shown us the way: We can balance the use of Canada's greenery to generate clean, climate-friendly energy against the value of trees and soils as a store for CO₂ and as a vital part of our environment and society. With more research, the great leafy turns of Canada's carbon cycle could become this country's green advantage in the fight against climate change. ■

Facts

From E1

have a major physical, ecological, social and economic impact worldwide this century.

One scenario predicts the Arctic Ocean will be nearly free of summer sea ice in 50 years, opening a Northwest Passage for shipping, but driving ice-dwelling seals and polar bears toward extinction.

A projected warming and melting of the Greenland Ice Sheet is

expected to contribute to global sea-level rise, affecting regional climates and coastal regions worldwide. The combined effect of rising sea levels, decreasing sea ice and thawing permafrost will leave coastal Arctic towns vulnerable to erosion and flooding.

ACIA chair Dr. Robert Corell says adapting to climate change is necessary, because even aggressive mitigative measures will take centuries to stall or reverse warming already underway.

"It took us a couple of hundred years to introduce this problem into

the planet. It's probably going to take us a millennium or more to get out of it, because the resident time of greenhouse gases, particularly CO₂, is in excess of a hundred years," said Dr. Corell.

"It's a long time-scale problem, that's why the suggestion that one should act now is so relevant. I know what needs to be done because I know what the science tells us, but how you do it is a political question," he said.

Dr. Corell is hopeful that ACIA's findings and its call to action will meet widespread acceptance.

"I'm an optimist on this because if you read the history of humankind, its capacity to address major challenges has always been constructive, even though painful," he said.

The ACIA report is based on moderate estimates of past levels of greenhouse gases and temperatures from prehistoric evidence, plus current measurements, satellite data, computer climate projections and information documented by indigenous Arctic peoples.

To read the ACIA Report overview, visit www.acia.uaf.edu. ■

This special information supplement was produced by Randall Anthony Mang in conjunction with the advertising department of The Globe and Mail, Richard Deacon, project manager • e-mail: rdeacon@globeandmail.ca

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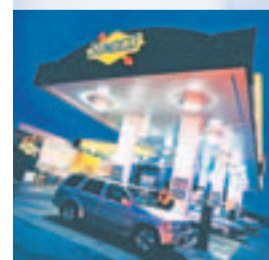
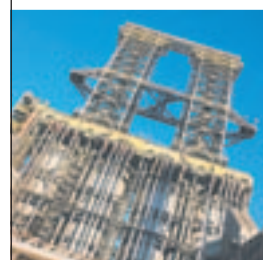
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JOHN WIEBE, PRESIDENT AND CEO, THE GLOBE FOUNDATION OF CANADA

Fighting climate change: a policy prescription

MATTHEW BRAMLEY
Director, Climate Change, Pembina Institute



During the 1990s, humans took 63 billion tonnes of carbon from the Earth's crust and put it in the air as carbon dioxide (CO₂). Only half of that CO₂ was reabsorbed by oceans and forests. For millennia the atmospheric concentration of CO₂ hovered around 280 parts per million (ppm). By 2003, we had pushed it to 376 ppm, a level probably unprecedented in 20 million years.

We're altering not only the atmosphere's composition, but the amount of the sun's energy it absorbs. CO₂ is a heat-trapping greenhouse gas (GHG). Unless we cut emissions sharply, climate zones are going to shift, species disappear, ice melt and sea level rise. The costs – environmental, human and financial – will be huge.

The excessive burning of carbon-based fossil fuels – coal, gasoline, other oil products and natural gas – is the principal cause. To stabilize the atmospheric concentration of CO₂ at a safe level and prevent the worst effects of climate change, we need to cut emissions from fossil fuels by well over 50 per cent.

Time is short. Paths to stabiliza-

tion of the CO₂ concentration at 550 ppm start to diverge sharply from paths to stabilization at 1,000 ppm around the year 2012. A CO₂ concentration of 1,000 ppm is likely to lead to very damaging impacts. Government bodies including the European Union and prominent CO₂-emitting companies like BP have concluded that stabilization must be achieved at 550 ppm or lower.

What do we need to do to get there? Increasing energy use by growing economies creates tremendous upwards pressure on CO₂ emissions. Even allowing for technological innovation, business-as-usual is clearly not going to take us where we need to go. Governments must intervene. Here are some key steps:

Agree to a series of near-term, legally binding emissions targets. Some people complain that the timeframe for the Kyoto targets (2008–12) is too short. But the polit-

ical reality is that without the Kyoto Protocol, the need to cut emissions would be nowhere near its present high level on governments' agendas. Governments must continue to face tough near-term targets under international law.

Adopt integrated energy and climate policies including long-term emissions targets. Incredibly, given that most emissions result from energy use, energy policy is still commonly discussed separately from climate policy. The U.K. set an important counter example in its Energy White Paper, which included a goal to cut CO₂ emissions by 60 per cent by 2050.

Legislate caps on industrial emissions. Over half the GHG emissions in a country like Canada come from industrial facilities. Governments can control these emissions in a business- and innovation-friendly way by fixing an overall cap, but allowing emissions trading under the cap. The European

Union's version of such a system will begin operating in January.

Use regulated standards and financial incentives to boost energy efficiency and renewable energy. There is tremendous potential for increasing the efficiency of products like vehicles, buildings and appliances. Uptake of efficient technologies can be boosted through financial incentives, while inefficient technologies are eliminated by regulation. Numerous jurisdictions in the U.S. and Europe are boosting renewable energy by combining production incentives and regulated quotas.

Ensure clean urban development. Our cities need to be more livable, with a far smaller environmental footprint. By requiring higher-density development and improving public transit, governments can drive major reductions in GHG emissions.

Take tough enough action to persuade developing countries to join in. GHG emissions from developing countries remain low on a per capita basis but are rising fast. And businesses that compete in global markets want to see emission constraints imposed globally. But

countries like China and India are not going to accept constraints if the developed world is not seriously cutting its own emissions.

How is Canada faring against this checklist? Not well. We've taken an important first step by ratifying the Kyoto Protocol, but we have no GHG target beyond 2012 and no national energy strategy. De facto energy policy is encouraging sustained long-term increases in emissions from Alberta's oil sands.

The federal government has developed legislation to create a system of mandatory emissions targets for large industry, but has not yet introduced it in Parliament. A voluntary approach is still being pursued for vehicle efficiency, while key energy regulations like building codes are years out of date. More positively, serious provincial and federal measures to boost renewable energy are underway. But our public transit systems languish far below European standards.

Overall, Canada's GHG emissions are 20 per cent higher than they were in 1990 and still increasing. A step change in our efforts is needed if we are to do our fair share to stabilize the atmosphere. ■



Rick Mercer

Every Canadian loves a challenge, right?

On average, each Canadian produces five tonnes of greenhouse gases a year. Driving, heating and cooling our homes, using appliances . . . almost anything we do that uses fossil fuels for energy also creates greenhouse gas (GHG) emissions. And these emissions are causing our climate to change.

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Visit www.climatechange.gc.ca/onetonne for a listing of energy efficiency grants, incentives and rebates offered by governments, utilities and the private sector.

These calculations are estimates based on national averages and can vary depending on circumstances.

"IT IS TIME TO BE DECISIVE. IT IS TIME TO LEAD, TIME TO START DOING THINGS DIFFERENTLY, AND TIME THAT THE FEDERAL GOVERNMENT AND THE PROVINCES CREATE A PROGRAM WITH TARGETS AND TIMELINES TO REDUCE CANADA'S GREENHOUSE GAS EMISSIONS."

DAVID SUZUKI

Forestry sector tackles climate change

BY SUE SHERLOCK

Canada's forest products industry is involved in a number of initiatives to reduce its use of greenhouse gas-emitting fossil fuels thought to be responsible for climate change. The results are dramatic.

Billions of dollars have been spent over the past 15 years on co-generation technologies that take biomass, in this case residue from the harvesting process such as bark and wood chips, and turn it into electricity. The energy produced

with biomass is carbon neutral and renewable, as long as the biomass is produced in a sustainable fashion.

"Today, 55 per cent of the pulp and paper sector's energy consumption comes from biomass," said Avrim Lazar, president and CEO of the Ottawa-based Forest Products Association of Canada (FPAC). "When we move to using biomass for energy, we are not only reducing air pollution, but taking what used to be waste headed for landfills and turning it into green energy."

In fact, since 1990 the pulp and paper industry has cut landfill waste

by nearly 30 per cent a year and reduced its reliance on fossil fuels by 31 per cent. Greenhouse gas emissions are down by 22 per cent from 1990 to 2000 – a period that saw production go up by 21 per cent.

Co-generation technologies and the use of biomass represent "a wonderful coming together of economic and environmental needs," added Mr. Lazar.

And while those mills generating energy from biomass are using most of that electricity themselves, with Canada's abundant source of biomass, there is potential to double the amount of electricity created and sell it to hydro companies. Hydro-Québec is involved in buying 74 megawatts of power – enough for 60,000 homes – from three biomass co-generation plants.

Mr. Lazar said the forest products sector has, through an MOU with Environment Canada, committed to reducing its greenhouse gas emissions a further 15 per cent by 2010 – the equivalent of taking 300,000 cars off the road.

FPAC biomass expert Paul Lansbergen said the association is also working with TerraChoice to implement an Environmental Choice Program or "EcoLogo" certification for plants that use biomass in their production. "With this EcoLogo certification, we will get better recognition for the fact that we use to a great extent, a renew-



PHOTO: COURTESY OF TEMBEC INC.

Sustainability is the new mantra of Canada's forestry sector.

able, plentiful resource in biomass."

Recognizing that heavy logging in some areas, however, is also contributing to a net reduction in a reduction of Canada's "carbon sinks" (lands that would otherwise naturally trap carbon), FPAC has introduced mandatory forestry certification to promote sustainable forest practices amongst its members.

"All members have to have their forest lands third-party certified for sustainable forest management by 2006. By that time, three-quarters of Canada's working forest will be certified," added Mr. Lansbergen.

FPAC's efforts on climate change have spawned an air quality improvement offshoot. Said the association's vice president, Envi-

ronment, Catherine Cobden, "If you are going to make an improvement in how much CO₂ you are sending into the environment, very likely that investment will have an air quality improvement attached to it. We realized both are linked and important and wanted to maximize the opportunity."

So FPAC is spearheading an air quality forum, due to launch in February of next year, that will bring players from all areas of the forest sector, including government, environmental agencies and health organizations, together to collectively address air quality issues and priorities.

"We're not waiting to be regulated – we are taking the initiative," said Ms. Cobden.

Corporate leaders take action

Canadian companies large and small are proving that thoughtful measures can do much to abate corporate GHG emissions and save money in the process.

Bell Canada

Idling vehicle engines are a major source of CO₂ emissions and air pollution. Bell Canada's wireless TelePod telematics technology is helping reduce the CO₂ emissions of Bell's Ontario fleet by 10 per cent. TelePod monitors engine idling, encouraging drivers to reduce unnecessary idling. TelePod also tracks the location of 5,000 Bell service vehicles, enabling more efficient dispatch and response.

DuPont Canada

In 2003, DuPont Canada formalized its commitment to reduce its greenhouse gas emissions by an average of 15 per cent by 2008-12 by signing a memorandum of understanding with the Government of Canada. The MOU provides recognition for DuPont's investments in technology dating back to 1997 and other early action that has put the company well on its way to achieving its emissions reductions goals.

Husky Injection Molding

Ontario-based Husky Injection Molding Systems has taken its environmentally responsible business model global with the opening of its new energy-efficient Shanghai Technical Center. The Technical Center is Husky's new Asia headquarters and provides plastic injection molding equipment and services. Designed by Husky, the facility uses 40 per cent of the average amount of energy required for a building of its size. The company also rewards its employees for buying fuel-efficient cars, cycling to work or using non-motorized lawn equipment.

Novex Couriers

Vancouver-based Novex Couriers has earned a reputation as one of B.C.'s most environmentally responsible couriers. The company was among the first commercial couriers in Canada to take proactive steps to address vehicle fleet emissions. Novex's goal is to convert its entire fleet to ultra-low-emission vehicles, a mission that has begun with its purchase of 10 gasoline-electric Honda Civic Hybrid cars.

Novex will add more hybrid vehicles next year and others that use natural gas and propane. So far, Novex's fleet of 100 vehicles is approximately 22 per cent "clean."

TransAlta

Canada's second largest GHG emitter, TransAlta, is preparing early to meet Kyoto emissions reduction targets. In 2002, TransAlta invested in clean energy through its purchase of Vision Quest Windelectric. This year, TransAlta made a major purchase of emission credits from Chile, demonstrating again its forward-looking approach to competing in a carbon-reduced world.

Canadian emissions trading market mired by uncertainty

BY TED DAVIS

Trading in the emissions market by Canada has declined steeply in recent years, while many developed nations increase their trading efforts to prepare for compliance with the Kyoto Protocol. As a result, some Canadian companies may find it difficult to take advantage of economic opportunities that may exist in emissions markets.

Until the past two years, Canadian firms were active in greenhouse gas emissions trading, says a broker in this still-emerging market. Formerly, Canada represented 31 to 33 per cent of all traded volumes, but that had slipped to about 13 per cent by 2003, says Doug Russell, managing director of Natsource in Ottawa. Canadian trading has since dropped to 3 per cent of the total, he says.

Meanwhile, Japan, for instance, now accounts for 41 per cent of global emissions trading activity, says Mr. Russell. And the European Union has committed itself to launching a collective emissions trading market by January 2005. This will play an essential role in helping some 12,000 industrial facilities in the E.U. meet mandatory emissions reduction requirements.

Canada's efforts, however, have been hobbled by a lack of political direction and resolve, say critics. According to Canada's Kyoto Protocol commitments, Canada has agreed to reduce its emissions by 6 per cent below 1990 levels between 2008 and 2012. But that goal is becoming increasingly challenging, says Matthew Bramley, director of the climate change program at the Pembina Institute, who notes that by 2002 Canada's overall emissions were 20 per cent above the 1990 benchmark level.

As such, the federal government must quickly give some regulatory muscle to Canada's reduction com-

mitments. "We have wasted a lot of years and the voluntary approach has clearly failed," says Dr. Bramley.

Without compelling legislation, many of Canada's large final emitters have taken the view that emissions reduction investments are irrelevant or unnecessary. "The signals have been confused for industry in Canada," said John Drexhage of the International Institute for Sustainable Development in Ottawa. "Few companies are currently taking it (emissions trading) seriously."

That is a mistake, say those large final emitters that have entered the emissions trading market before they are obligated to do so. "There will be a lot of scrambling around as companies prepare to enter this market," said Don Wharton, director of Sustainable Development at TransAlta in Calgary. He predicts "a large price increase (in emissions credits) as we approach the Kyoto compliance period."

As such, TransAlta and others, such as Suncor, have sought reliable and proven emissions trading partners. Some of the most stable are located in South American countries such as Chile and Brazil, while others are in Mexico, Russia, India and China. All are obligated to undergo a rigorous double-auditing process to verify their emissions reductions results, but there is still the risk of encountering trading partners "who only have dollar signs in their eyes," says Wharton.

To lessen this international risk factor, all stakeholders agree that Canada must develop a domestic market in emissions "offsets." But without a defined legal framework, Canadian companies currently find themselves in the odd position of being exposed to more risk by trading domestically than internationally.

"We would be very willing to invest in a Canadian emission offsets market," said Mr. Wharton. "But right now, Canada actually presents a higher risk."

BY JODIE WARREN

In an era where an environmental crisis looms and the world continues to have an insatiable appetite for fossil fuels, oil sands giant Suncor Energy Inc. has taken a proactive approach that it hopes will help ensure its longevity – and that of our planet – well into the future.

In addition to finding ways to reduce emissions from its development of one of the world's largest petroleum resource basins – Alberta's oil sands – Suncor is also diversifying its portfolio to include alternative forms of energy production.

Gord Lambert, vice president of Sustainable Development, says Suncor's work on the issue of climate change reflects the company's long-term point of view.

"The fact that we are developing a resource that is as significant in size as this means that we needed to engage ourselves early and work toward long-term solutions," he says.

Suncor's work in sustainability has the approval of environmental organizations such as Pollution Probe. "The oil sands business is a very energy-intensive way to obtain fuel," notes Pollution Probe executive director Ken Ogilvie. "At the same time, Suncor has made commitments to the Kyoto Protocol in GHG reduction through its efforts to implement a sustainability

approach."

Among its initiatives, Suncor is supporting the international CO₂ Capture Project, which is researching cost-effective methods to capture significant amounts of CO₂ emitted from power generation and industrial sources. It is also striving to make its oil sands operation more energy efficient, and is introducing ethanol into its fuel products and decreasing their sulphur content.

Such measures should help Suncor meet its obligations required by Canada's national plan related to large emitters.

While Mr. Lambert is clear that Suncor's hydrocarbon energy business will continue to form the backbone of the company, he points out that Suncor is doing what many others in its industry aren't: investing in technology that falls outside of its lucrative, core business.

"Certainly the issue of climate change for those of us in the hydrocarbon energy business is a source of risk in terms of potential policy changes and how the issue is going to ultimately be addressed," he says. "Because of this, we feel it's important to diversify. Forms of energy that are less carbon-intensive have a role in our future."

Suncor's commitments in renewable energy include its launch of the SunBridge Wind Power Project in Gull Lake, Saskatchewan, a \$22-million wind power project in partnership with Enbridge Inc.

Oil sands giant sees role for diversity

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STÉPHANE DION, MINISTER OF THE ENVIRONMENT

Expanding Clean Energy use makes sense for Canada and Ontario

R.B. BRENNAN
President and CEO, Manitoba Hydro



In Manitoba, we're fortunate to have 98 per cent of our electricity needs met from clean, renewable energy sources. Tapping into a share of Manitoba's estimated 5,000 MWs of undeveloped hydropower, as well as its strong wind resource, will help Manitoba and its neighbours, especially Ontario, meet its electricity needs, help Canada achieve its Kyoto targets, reduce air pollution in Southern Ontario and provide economic benefits to First Nations and all Canadians.

For these reasons, the governments of Manitoba and Ontario,

under the Clean Energy Transfer Initiative (CETI), are working with Manitoba Hydro and Hydro One to undertake technical studies of proposed clean energy development in Manitoba and the transmission

expansion required to deliver that power to Canadian markets.

The CETI proposes that Manitoba supply Ontario with 1,500 MWs of clean, renewable energy, thus helping Ontario meet its goal to phase out coal-fired generation. This would also deliver a major new contribution to meeting the federal government's CO₂ reduction targets, by creating the country's largest single CO₂ reduction project, and would deliver significant reductions in pollutants such as SO_x, NO_x, mercury and particulates that create acid rain, smog and wider health concerns.

These expected outcomes are supported by the work of one of Canada's leading energy and environmental organizations, the Pembina Institute for Appropriate Development, which determined that the total lifecycle global warming-related emissions from the Wuskwatim hydro project in Manitoba were 290 times less than coal, and 130 times less than even the most efficient natural gas generation technology.

At the same time, Ontario industry, investors and consumers would benefit from more stable electricity prices and increased diversity of supply, while greater East-West transmission capacity would strengthen the reliability of our national grid, along with our national energy security. The multi-billion-dollar project would create employment and economic opportunities, in northern and First Nations communities in Manitoba and northern Ontario, and nationwide through the supply of turbines, generators, wind industry components, engineering, construction and financial services.

In Manitoba, 5 First Nations are presently pursuing new hydroelectric projects in their traditional-use territories through innovative partnership arrangements with Manitoba Hydro. The Nisichawayasihk Cree Nation is proposing to partner as co-owners of up to one-third of the 200 MW Wuskwatim generating station. Four other Cree Nations are involved in the 620

MW Gull (Keeyask) generating project, and discussions have been initiated with a number of northern Aboriginal communities to explore ways that they may participate in development of the 1,250-MW Conawapa generating station.

These First Nations are not only exploring ownership, employment and business opportunities, they are also active partners in the environmental planning process, ensuring that these projects recognize their special relationship with the land and the waterways. As an example, with First Nations participation, the design and capacity for Wuskwatim was modified to reduce adverse impacts on local people and produce less than one-half square kilometre of flooding.

These efforts are all part of Manitoba Hydro's continuing growth as a world leader in corporate action to address climate change. For example, Manitoba Hydro has retired four coal generating units, converted two other coal units to natural gas, and, in

2003, became a founding member of the Chicago Climate Exchange, a voluntary marketplace designed to facilitate the reduction and trading of greenhouse gas emissions.

Manitoba Hydro also has one of the longest running and most successful energy conservation programs in North America, and will soon be announcing aggressive new Power Smart programs that double its energy conservation targets. Plans are also well developed to add wind power to Manitoba's electricity supply, with the first 100-MW wind farm already announced and under development at St. Leon.

By taking advantage of the synergy between reliable hydro power and wind power, and through expanded and accelerated energy conservation programs at home, we believe Manitoba Hydro will not only achieve its own goals and meet the needs of Manitobans, but in the process add to Canada's supply of clean, renewable power for the benefit of all.

Driving change

BY RANDALL ANTHONY MANG

A bevy of new low-emissions vehicles including cars, buses, SUVs and other models - many of which incorporate "hybrid" powertrains that utilize advanced, combined internal combustion engine and electric motor systems to deliver higher fuel efficiencies with lower emissions - are offering drivers an ever expanding range of environmentally superi-

or driving choices.

Environmental proponents would like to see governments do more to encourage consumer uptake and stimulate automakers to make and sell more. So far, only three provinces, British Columbia, Ontario and Prince Edward Island, offer rebates to hybrid vehicle buyers. A few financial institutions are also helping, including VanCity Savings Credit Union in Vancouver, which offers low-interest loans.

Will government support for 'green' clean-air technologies bring bluer skies?

BY PETER CAULFIELD

The federal government may be a high-profile supporter of new clean-energy technologies that help reduce harmful emissions and improve air quality. And recently, some provinces have demonstrated interest in employing green technologies. But some renewable energy proponents say that relative to other nations, Canada is not putting enough money or effort behind its good intentions.

In its October 2004 Throne Speech, the federal government stated it will "engage stakeholders in developing comprehensive approaches to encourage increased production and use of clean, renewable energy and to promote greater energy efficiency." Whether these measures will put Canada on a competitive footing relative to other nations remains to be seen.

Kory Teneycke, executive director of the Canadian Renewable Fuels Association, a Toronto-based ethanol and biodiesel industry association, criticizes Ottawa for what he believes is its excessive financial support of the petroleum industry.

"The government has spent \$43 billion over 20 years on subsidies to the petroleum industry," Mr. Teneycke says. "Traditional fuel technologies receive more support than new technologies in Canada."

Mr. Teneycke says the governments of other countries, such as Brazil and the U.S., are bigger financial supporters of clean-air technologies.

Mark Rudolph, co-ordinator of the Toronto-based Clean Air Renewable Energy Coalition, also says more needs to be done. "Canada needs to develop a national renewable energy strategy in order to reach our goal of at least 7 per cent of our electricity production from low-impact, renewable sources by 2010 and 15 per cent by 2020," he says. "The result would not only be clean air and reduced greenhouse gas emissions and the diversifying of Canada's energy supply, but also the creation of 20,000 new jobs by 2015."

Mr. Rudolph recommends increasing incentives to produce wind power, and creating a green power production incentive for other low-impact renewable technologies, such as small hydro, biomass, geothermal, wave and tidal.

Such incentives can be effective, if they are complemented by provincial policies that support green power.

For example, Canada's \$100-million Ethanol Expansion Program is encouraging the construction of new plants via direct capital contributions, helping overcome a key industry barrier - private-sector resistance to investing in the emerging renewable fuels sector. So far, however, only Ontario, Manitoba and Saskatchewan are moving to mandate ethanol content in fuel.

Similarly, Canada's \$260-million Wind Power Production Incentive

complements the interests of provinces that have strong commitments to wind energy, such as Quebec and Ontario, and Prince Edward Island, which is evaluating opportunities for having renewable sources make up 100 per cent of its electrical capacity by 2015.

While Canada's federal and

provincial efforts represent a start, most pale on a global scale. For example, Canada's Wind Power Production Incentive aims to boost Canada's wind power capacity from the current level of 439 megawatts to 4,000 megawatts. While substantial, the target still pales when compared to Germany, a clean energy

leader that already has 15,700 megawatts of wind power capacity in place.

"Green power is moving out of the niche and into the norm," said Mr. Rudolph. "But if Canada wants to be truly competitive internationally, we need to step up to the plate with even greater support."



Ford Escape Hybrid

The 2005 Ford Escape Hybrid achieves its high fuel economy, clean emissions and spirited performance similar to a V6 thanks to an advanced powertrain that combines the best elements of gasoline and electric vehicles.



GM Hybrid Pickup

GM's new V8-powered hybrid pickup truck can haul just as much as its conventional counterpart, but achieves 10 to 15 per cent better fuel economy. This heavy-duty pickup packs extra punch. Its pair of 120-volt electrical outlets can power tools at a construction site or run appliances at a campground.



Honda Accord Hybrid

Utilizing a next-generation hybrid powertrain, the 2005 Accord V6 Hybrid delivers power and performance greater than the current 240-horsepower Accord V6 with the fuel economy of a four-cylinder Civic sedan.



smart

Of approximately 1,000 "smart fortwo" autos introduced in Canada in 2004, all were sold before the tiny diesel engine-powered vehicles arrived onshore. Low weight, road resistance and fuel consumption add to smart's efficiency. An electronically regulated exhaust system reduces nitrogen oxide emissions.



Honda Civic Hybrid

Compared to other Civic sedans, this hybrid provides 30 per cent better fuel economy. It produces about 90 per cent fewer smog-forming engine emissions than a typical new vehicle, which helped it be the first hybrid to earn Advanced Technology Partial Zero Emission Vehicle (AT-PZEV) status under California's Zero Emission Vehicle program.



Toyota Highlander Hybrid

Just announced, Highlander Hybrid is the world's first seven passenger hybrid SUV. In addition to providing the fuel economy of a compact sedan, it will be rated as a Super Ultra Low Emission Vehicle (SULEV).



General Motors Canada and New Flyer Industries

BC Transit will be the first transit system in Canada to put GM's advanced hybrid diesel-electric system in regular service. Buses equipped with GM's hybrid system improve fuel economy by up to 50 per cent and reduce emissions by up to 90 per cent when compared to a conventional diesel.



Toyota Prius

The world's first mass-produced gasoline/electric hybrid, Prius was named the 2004 North American Car of the Year and won the 2004 EnerGuide Award for Fuel Efficiency in its category, and the 2004 International Engine of the Year award. Prius is the world's best-selling hybrid automobile.

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Feds face up to big decisions on climate change

BY RANDALL ANTHONY MANG

Prime Minister Martin has stated that Canada will respect its commitments to the Kyoto accord on climate change. According to information provided this week, the federal government is intent on keeping its word.

"We will respect our Kyoto commitments in a way that produces long-term and enduring results while maintaining a strong and growing economy," says Environment Minister Stéphane Dion. "We know that this is a challenge for Canada; it is a challenge for many countries."

The Government of Canada says it is pushing for Canadian solutions that will position Canadian industries as world leaders in new technologies, and that will help

advance federal priorities in many areas.

"To reach this target, we cannot act and think in isolation," says Minister Dion. "We need to take into account the links between climate change and a whole range of issues, such as air and water quality, species-at-risk, agriculture, forestry, life and development in the North, and the health and safety of Canadians."

"Addressing climate change must be part of how we approach the government's new deal for cities and communities, our transportation and building policies, as well as our determination to position Canada for the 21st century economy."

With Russia having ratified, the Kyoto Protocol is putting pressure on all countries to take more aggressive action.

For Canada, the big decisions to

be made include how it will implement an emissions reduction system for large final emitters; how to move forward on implementing vehicle fuel efficiency improvements; key new large-scale measures to achieve emissions reductions in the Kyoto timeframe as well as the medium and longer term; and a plan on science and adaptation.

The federal government will continue to collaborate with partners in government and industry in completing a truly national strategy that is fair and contributes to economic growth. Work is underway to develop memoranda of understanding with interested provincial and territorial governments outlining how the governments will jointly move forward.

"The Government of Canada has many initiatives to encourage energy efficiency, renewable energy and the sequestration of carbon," said Minister of Natural Resources Canada, John Efford. "The Speech from the Throne, which highlighted the government's continued commitment to address climate change, also indicated we will invest \$1 billion from the sale of our Petro-Canada shares to support emerging environmentally friendly technologies. We will also quadruple our investment in the Wind Power Production Incentive and will work with industry and provinces to develop a long-term vision, supported by aggressive action."

Federal experts agree that ultimately the world's effort to address climate change must go beyond Kyoto and involve more countries making deeper reductions in greenhouse gas emissions.

Green Fund inspires sustainability

BY JOHN ARDEN

A federally backed investment initiative that helps Canadian communities enhance their sustainability has delivered strong environmental benefits since its inception in 2000. The Federation of Canadian Municipalities' (FCM) Centre for Sustainable Community Development (CSCD), which administers the Green Municipal Funds (GMF) program, hopes to see the funding boosted to meet rising demand.

GMF "encourages municipalities to incorporate green technologies into their plans and develop sustainable infrastructure," says CSCD director Elisabeth Arnold. To date, the \$250-million federal endowment has funded 300 studies and 50 projects involving energy, water, transportation, waste and sustainable community planning in communities of all sizes in all regions of Canada.

FCM is now asking the federal government for an additional \$250 million to bring GMF to a \$500-million funding level. "We think that the success of the program so far supports the justification for its top up," says Ms. Arnold.

The CSCD reports, for example, that 34 projects have led to the reduction of 750,000 tonnes of CO₂ emissions. Another 28 projects have led to the reduction of 850 tonnes of NO_x (nitric oxide and nitrogen dioxide), SO_x (chemical compounds of sulfur and oxygen) and other serious air pollutants.

Michael Harcourt, chair of the Prime Minister's External Advisory Committee on Cities and Communities, says GMF and related initiatives such as Infraguide – a joint initiative that helps municipalities make informed decisions concerning sustainability – are "hugely important."

"They offer guidance to how infrastructure funding should be applied in the future," said Mr. Harcourt. "Climate change and sustainability questions are both central to



PHOTO: ALAIN LAFOREST

La Cité des arts du cirque in Montreal isn't just styling, it also earned coveted awards from the Canadian Urban Institute.

the long-term sustainability vision and strategies the prime minister has asked our advisory committee...to report back on."

Ms. Arnold says, "The Green Funds are unique because they meet community needs at the capacity level," supporting projects small and large.

Between 2002 and 2003, for example, GMF provided the Town of Craik and the Rural Municipality of Craik, Saskatchewan, with a \$100,000 grant and a \$150,000 loan used to fund Craik's half-million-dollar project to explore ways to achieve long-term sustainability and rural revitalization.

"This was the second step of Craik's three-step plan to construct an innovative multi-purpose building to showcase 'green' technologies and environmental practices," says Ms. Arnold. "The response in Craik was enthusiastic and positive. Community education on sustainability is integral to this project, which will ultimately incorporate most of the 'green' features into a community eco-village-type housing pilot pro-

gram."

In Montreal, the GMF-supported urban revitalization project TOHU – La Cité des arts du cirque – earned coveted awards from the Canadian Urban Institute, which in 2004 honoured TOHU with its Green Design and Technological Innovation award and "Best Overall Project."

The project involved TOHU's contribution to the revitalization of Montreal's Saint-Michel neighbourhood. GMF helped support the innovative development of TOHU's public pavilion, which includes a theatre, workshop and exhibition hall. Among its innovations, the facility's heat is derived from biogas harnessed from a nearby landfill site, directly displacing approximately 135 tonnes of greenhouse gases annually.

Like all GMF-supported initiatives, TOHU provides direct and indirect environmental benefits.

"Projects like these demonstrate how ingenuity and new ideas can generate environmental and social benefits," says Ms. Arnold.

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One-Tonne Challenge

BY MICHAEL MURPHY

A new federal program dubbed The One-Tonne Challenge has taken flight. Its mission: to motivate individuals, communities and businesses to take action on climate change the easy way – by saving money.

Every year, each Canadian produces, about five tonnes of greenhouse gas emissions. The One-

Tonne Challenge asks Canadians to reduce their emissions by one tonne, or about 20 per cent.

Meeting the Challenge can be as easy as following tips that range from the simple – changing the air filter on your furnace and turning off your engine instead of idling – to the more ambitious, such as buying a high-efficiency furnace or a fuel-efficient vehicle.

A growing contingent of busi-

nesses including Scotiabank, VanCity Savings Credit Union, Home Depot and Hudson's Bay Company are lending support by engaging their employees and offering customer incentives.

More than 40 communities across the country are helping by leading GHG emission-reducing activities.

A national advertising campaign launched last week and featuring comedian Rick Mercer is encouraging more Canadians to get involved.

To learn more about the program, visit www.climatechange.gc.ca/onetonne



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