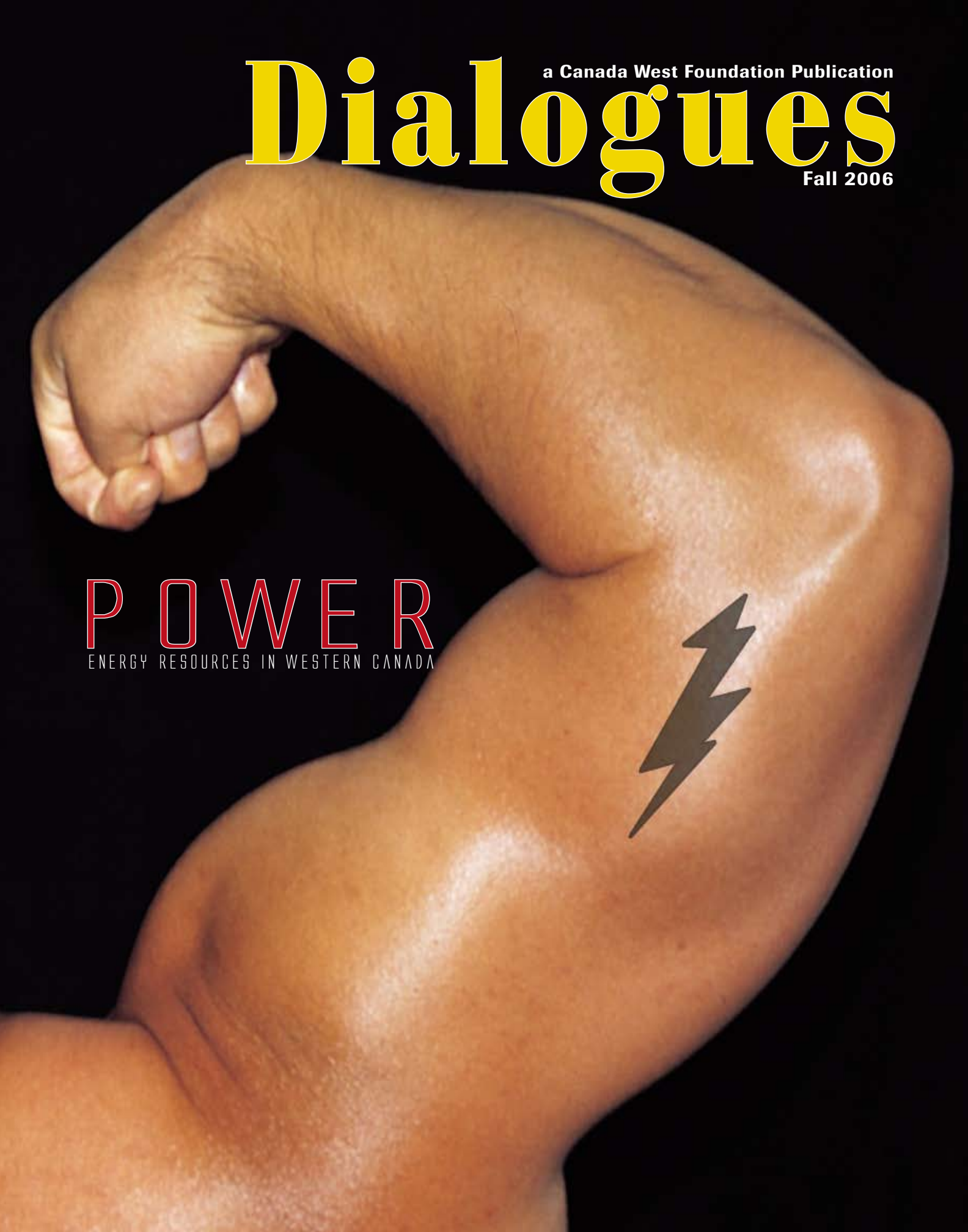
a Canada West Foundation Publication

Dialogues

Fall 2006



POWER

ENERGY RESOURCES IN WESTERN CANADA

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A dynamic and prosperous West in a strong Canada.

Our Mission

A leading source of strategic insight, conducting and communicating non-partisan economic and public policy research of importance to the four western provinces, the territories, and all Canadians.

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In 1970, the **One Prairie Province? A Question for Canada** Conference was held in Lethbridge, Alberta. Sponsored by the University of Lethbridge and the *Lethbridge Herald,* the conference received considerable attention from concerned citizens and community leaders. The consensus at the time was that research on the West (including British Columbia and the Canadian North) should be expanded by a new organization.

To fill this need, the Canada West Foundation was established under letters patent on December 31, 1970. The first Canada West Council was elected in June 1973.

Since that time, the Canada West Foundation has established itself as one of Canada's premier research institutes. Non-partisan, accessible research and active citizen engagement are hallmarks of the Canada West Foundation's past, present, and future endeavours. These efforts are rooted in the belief that a strong West makes for a strong Canada.

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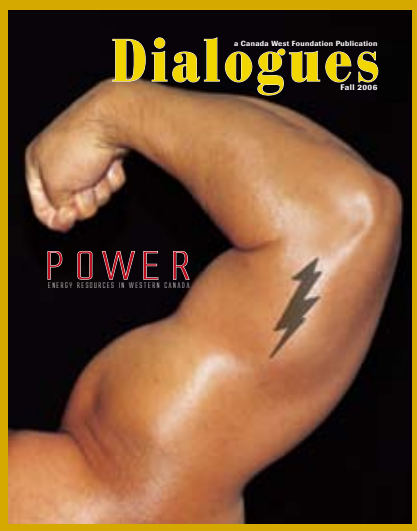

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A Note from the Editor

Robert Roach, Director of Research
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Power

In so many ways, power defines life in Canada. And I don't mean political power or military power or the power a parent wields over a child. I mean the stuff that keeps our fridges cold, water hot, streets lit, cars moving, furnaces burning, air conditioners humming, computers running, mobile phones ringing and factories producing. Even if I take the stairs at work instead of the elevator, I need to swipe a card reader that uses power. A colleague of mine who lives outside the city can't flush the toilet if the power goes out because her home uses a septic tank system that uses an electric pump. And I'm certainly not writing this on a manual typewriter!

As a consumer of power, all I have to do is flick a switch or gas up my car and there it is: power at my very fingertips. But that switch and gas pump are the tip of an incredibly complex iceberg of human ingenuity and effort. There are power lines, turbines, refineries, trucks the size of houses, mines, wells, smokestacks, scientists, regulatory agencies, energy markets, rig workers, and on and on.

At the centre of all of this activity is the raw material and natural forces from which we have learned to draw power. There is the wind, rivers, tides, sun and geothermal heat. There is oil and gas trapped beneath the earth. There is coal and uranium. There is wheat, manure, and even French fry grease.

Western Canada is fortunate to have an abundance of these power sources. But, it is far from a simple task to find, extract and transform these raw sources in ways that are profitable and environmentally sustainable. As the articles that follow attest, maximizing the benefits of the West's vast store of power sources requires creative thinking, entrepreneurship, political leadership, careful planning and increased cooperation among stakeholders. The opportunities are many, but the challenges are great.

In terms of exporting our energy resources, the West is at the mercy of global forces and markets beyond its control. Recent history shows that a barrel of oil can rise to $70, but you don't have to go back even 10 years and it was under $15.

Another longstanding issue, and one that looms larger and larger, is the tricky question of balancing the development of western Canada's bounty of power sources with maintaining and improving other natural capital assets such as farmland, watersheds, habitat, and tourism destinations.

There are also outstanding concerns regarding air quality, and "Kyoto" remains shorthand for the bundle of issues related to greenhouse gases and the range of policy responses that have been suggested to address them.

In addition to the tension between environmental protection and energy projects, there are also existing and potential clashes between economic sectors (e.g., the petro-chemical sector would like access to the natural gas being used to extract oil from the tar sands) and between energy projects and communities (e.g., opposition to the drilling of sour gas wells near urban centres and the construction of new nuclear power plants).

Infrastructure is another issue. For example, Manitoba's hydro capacity is underutilized because of a lack of transmission lines and pipeline construction may be constrained by labour and material shortages. This points to the critical importance of interprovincial cooperation on energy in the region. As with many other things, the four western provinces are likely much better off thinking about the region's power sources as a single system rather than four separate ones. Saying this, of course, is much easier than making it a reality.

The power we use to run our machines also speaks to political power in Canada. There have been, and will continue to be, calls for a review of the federal government's role in the development of the West's energy resources. Canada's First Nations are also key players in this development and there are numerous outstanding issues to be resolved in this regard.

One need look no further than the many ups and downs associated with the idea of building a pipeline to bring northern gas to southern markets to appreciate the political complexities of energy development in western Canada.

None of this is meant to dampen spirits about the West's vast supply of power. Indeed, technology, entrepreneurial activity and good public policy can combine to harness the West's power and achieve great things. What we must keep in mind, however, is that this will not be easy. Tradeoffs will be required. Proactive planning and meaningful cooperation will be at a premium.

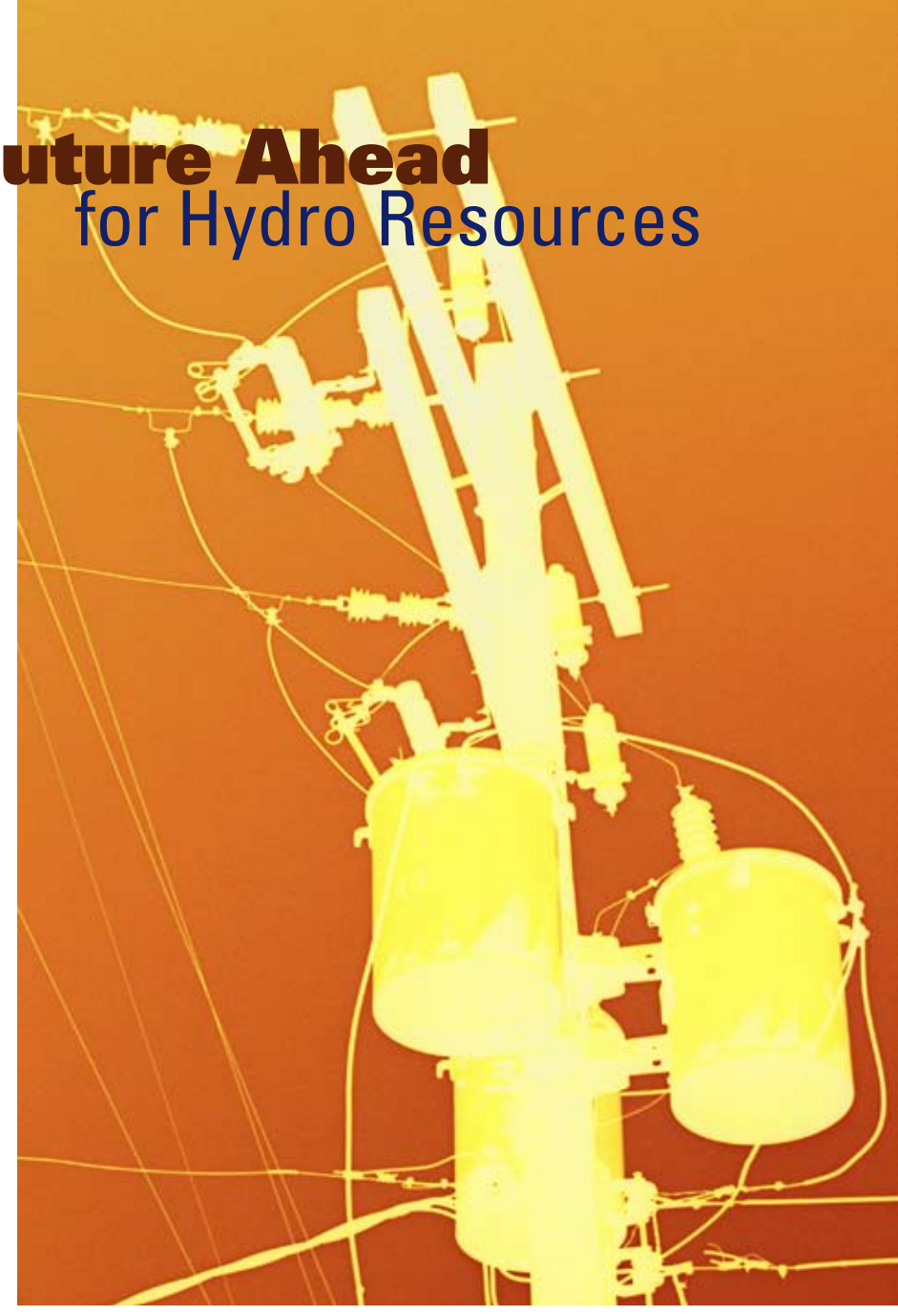
Fortunately, the power required to make this happen does not just lie in the West's rivers, natural gas, or uranium deposits; there is also an abundant supply of energy in the form of the ideas and abilities of western Canadians. If we work together and plan carefully, we have the power to be the best in the world at producing the sustainable energy the West, Canada and the world needs.

Let me take this opportunity to thank the contributors to this edition of Dialogues. All the articles were written on a pro bono basis and all of them shed light on important aspects of the power puzzle in western Canada. I also want to thank the Canada West Foundation's Chief Economist Todd Hirsch for assembling and working with the fine list of contributors to this edition. Thanks are also due to Dr. Loleen Berdahl for her role as Assistant Editor and to Jason Azmier for the layout and design.

If you have any questions or comments, please do not hesitate to contact me at roach@cwf.ca.

A Bright Future Ahead for Hydro Resources

by Glenn Schneider



Manitoba is becoming

recognized nationally and internationally as a leader in developing clean energy sources including ethanol, biodiesel, wind power and geothermal, but the province is best known for hydropower. Virtually all the province's electricity is generated by hydropower, with 5,000 megawatts (MW) of installed capacity. In 2005, Manitoba was Canada's largest exporter of electricity to the US, accounting for 50% of our country's net electricity exports to our southern neighbour. With only one-half of the province's 10,000 MW of acceptable hydropower potential capacity developed, hydropower has been characterized as "Manitoba's oil." While the appropriateness of comparisons to Alberta's booming energy sector and its forecast $100 billion oil sands investment can be debated, the fact is northern Manitoba offers exciting potential for new investment in low-impact hydropower resources to help Manitoba and its neighbours meet their growing demand for electricity.

"In pursuing our objective of supplying, clean, reliable cost-effective renewable energy to Manitobans, we are planning for the continued development of Manitoba's abundant hydropower resources, but in a way that reduces impacts on the environment and creates opportunity for local people to share in the benefits of development," says Bob Brennan, President and CEO of Manitoba Hydro. "In doing so, we will help the environment by reducing greenhouse gas emissions and air pollution, and at the same time provide economic benefits to Aboriginal people and other Canadians."

Three new northern hydropower generating stations entailing a potential investment exceeding $10 billion (including transmission) would add over 2,000 MW of generating capacity and bring over two decades of major project construction to the province's north, ultimately increasing Manitoba's hydropower generating capacity by 40%. These investments would be a major driver in the Manitoba economy and provide surplus power for export until required for domestic needs, meanwhile earning important profits to reduce cost burdens to domestic ratepayers.

The most advanced of the new projects is the $1.3 billion 200 MW Wuskwatim generating station on the Burntwood River, which is being developed through an innovative partnership between

Manitoba Hydro and the Nisichawayasihk Cree Nation (NCN), with NCN having the opportunity to have up to 33% equity ownership. NCN has been an active partner in the planning, community consultations and environmental studies for Wuskwatim, looking to ensure the project design delivers the greatest possible benefits with the least possible impact to the area's land and water. Cree traditional knowledge has been an important factor in the examination of potential environmental impacts, ensuring the special relationship the Cree have with the land and waterways is taken into account. With NCN's participation, the design for the Wuskwatim station was modified to limit flooding to less than one-half square kilometer. Under the partnership, NCN benefits from training, jobs in project construction, business opportunities including over $100 million in direct negotiated contracts for such services as construction of an access road to the dam site, construction camp infrastructure and catering, and a share in project profits. Construction commenced this summer and will take 6 years, with construction employment projected to peak at 540 workers.

The Pembina Institute for Appropriate Development has quantified Wuskwatim's global environmental benefits. The total lifecycle global warming-related emissions from Wuskwatim were determined to be 290 times less than coal and 130 times less than even the most efficient natural gas generation technology. "With its exceptional environmental performance and leading edge partnership with the First Nation, Wuskwatim is a world class project that will be a model for First Nations to benefit from natural resource development projects in Canada," Brennan proudly points out.

Four other First Nations – Tataskweyak, War Lake, York Factory and Fox Lake – are engaged with Manitoba Hydro in joint planning, environmental studies and discussion of potential business arrangements for the Keeyask generating station. Located between Split Lake and Gillam on the Nelson River, Keeyask would produce 620 MW of power and is projected to cost $3.75 billion. Earliest in-service date would be 2017. A decision to proceed with the project will be subject to completion of a public review of the environmental impacts of the project, completion of a Joint Keeyask Development Agreement among the parties and business case verification.

More recently, Manitoba Hydro has initiated discussions with a number of northern Aboriginal communities to examine ways they may participate in development of the Conawapa generating station. Located some 800 kilometres north of Winnipeg on the Nelson River about 90 kilometres downstream of the town of Gillam, Conawapa would also be designed to produce minimal flooding – approximately five square kilometres. Conawapa will add some 1,250 MW to Manitoba Hydro's generating system. Costs are projected to be in the neighbourhood of $6 billion, including transmission facilities. Construction would require approximately 8.5 years, with an earliest possible in-service date of 2019.

Development of new transmission is required to meet reliability requirements in Manitoba. Further development of northern generating capacity will also add to the need for new transmission in Manitoba as well as interconnections to export markets. In particular, east-west transmission capacity must be augmented for the full benefits of Manitoba's expanded hydropower production to be shared with other Canadian provinces. For example, Manitoba's undeveloped hydropower resources have been identified as potentially playing a role in meeting a portion of a projected 25,000 MW supply/demand gap in Ontario. However, Manitoba's current east-west transmission linkages constrain exports, with transmission capacity to Ontario and Saskatchewan limited to 200 MW and 375 MW, respectively. In contrast, transmission capability to the US, developed over 40 years of trade with neighbouring states, is 2,250 MW. Clearly, improved east-west transmission would strengthen the national power grid and improve Canada's energy reliability and security of supply.

Bringing hydropower projects from potential to reality is not without its challenges. Complex regulatory frameworks have resulted in lengthy and cumbersome approval timeframes for hydropower projects compared to other energy generation

Glenn Schneider is the Division Manager, Public Affairs with Manitoba Hydro (www.hydro.mb.ca). Manitoba Hydro, the province's major energy utility, provides electricity throughout the province and natural gas distribution in southern Manitoba. A provincial Crown Corporation, Manitoba Hydro is a leader in energy conservation and renewable energy production and is one of the largest energy utilities in Canada.

approved, contrasted to months for natural gas generation and weeks for wind power projects. Policy incentives such as emission-reduction credits for new clean hydropower facilities and increased focus on global environmental benefits of hydropower will be increasingly important considerations in future project approvals. The challenge is to ensure economic, environmental, social and technical implications are carefully considered and potential negative implications avoided, mitigated or compensated to the fullest extent feasible so that society can realize the benefits of clean, renewable hydropower. Discussions to ensure that potentially impacted peoples fully understand proposed projects and their potential impacts and benefits and have the opportunity to share in project benefits, can be complex and cannot be rushed. This is particularly important when trust must be rebuilt with parties who have been impacted by earlier projects. Finally, project scale and cost dictate that there be confidence in securing markets before a decision is made to proceed.

"Further development of northern generating capacity will also add to the need for new transmission in Manitoba as well as interconnections to export markets. In particular, east-west transmission capacity must be augmented for the full benefits of Manitoba's expanded hydropower production to be shared with other Canadian provinces."

In spite of these challenges, strong forces are at work for continued expansion of hydropower generation in Manitoba. Growing regional demand for electricity, the minimal environmental impacts of new hydropower projects, the global environmental benefits of hydropower (greenhouse gas reduction), opportunities for local Aboriginal peoples, and improved reliability, price stability and predictability for Manitobans and export customers, all point toward an important role for Manitoba hydropower in the cost-effective expansion of Canada's electricity supply.

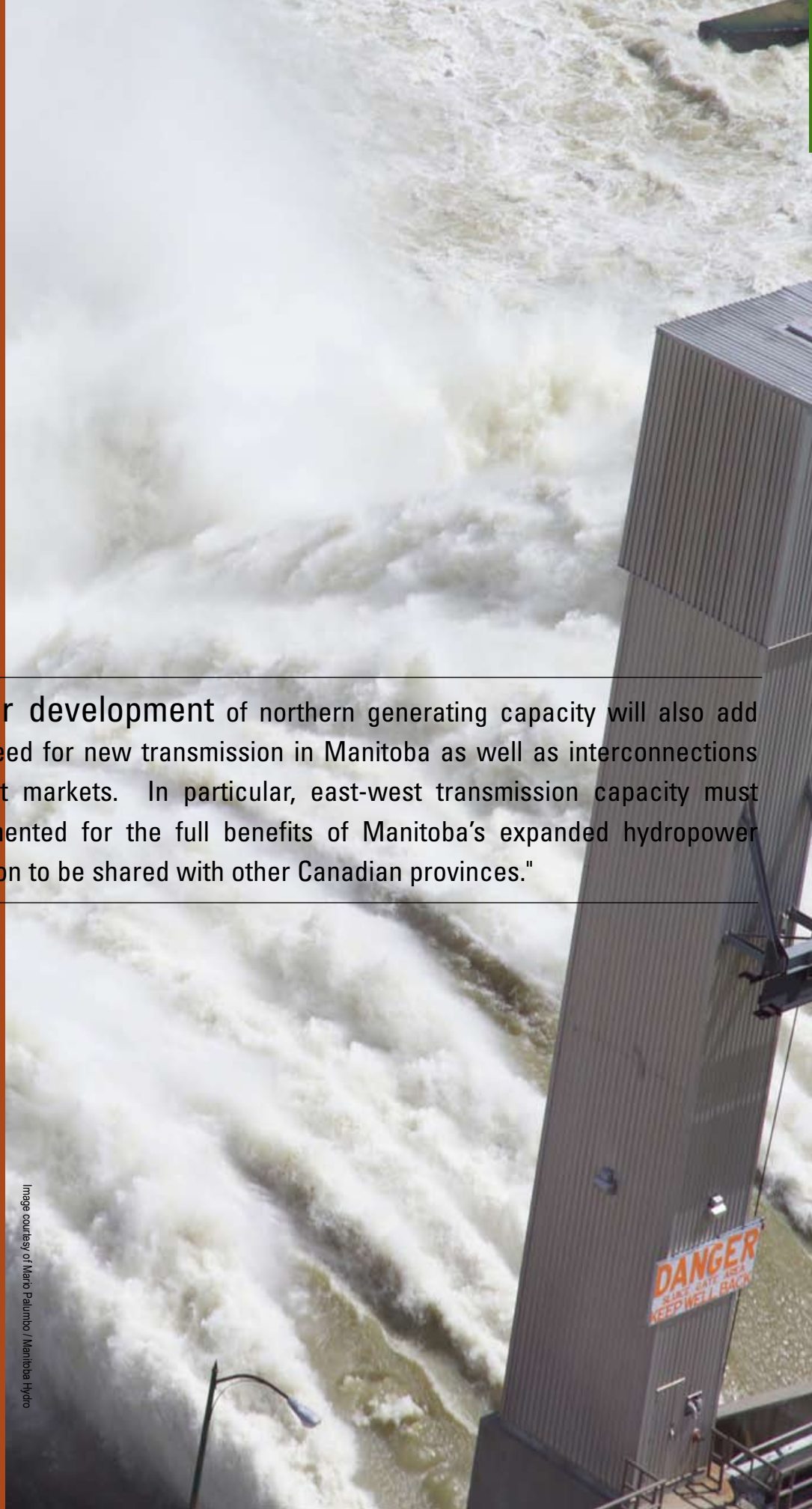


Image courtesy of Mario Palumbo / Manitoba Hydro

Garry Hastings is the Assistant Deputy Minister of the Energy Development Initiative for Manitoba Energy, Science and Technology (www.gov.mb.ca/est). In summer 2006, Mr. Hastings shared his perspectives on western Canada's energy future with the Canada West Foundation.

Energy in the West: Where Do We Go From Here?

An Interview with Garry Hastings

CWF: What do you see as the single most important energy issue for Manitoba over the next five years?

GH: Existing transmission constraints are the single most important issue for energy development in Manitoba. Manitoba has hydro-electric resources of 5,000 megawatts (MW) left to develop, but they cannot be built without new transmission being built prior to building the new generating stations. It has become difficult to plan the "in service dates" for these facilities due to uncertainties about the regulatory process. Because new bulk lines must traverse long distances from the north or to the US or our neighboring provinces, approvals are also needed in these jurisdictions.

CWF: How do you see renewable energy (hydro and wind energy in particular) contributing to western Canada's overall energy supply?

GH: I think it could be an important part of the energy shopping basket for all western provinces. Manitoba's interconnections with Saskatchewan are only about 400 MW. The Saskatchewan-Alberta interconnection is also very weak in part because the two electric systems are asynchronous.

Both Saskatchewan and Alberta depend to a large extent on coal and natural gas electricity generation. Manitoba power, with its attendant clean air benefits, could displace some of these generation sources. Additionally, there are important benefits such as helping with western Canada's energy security, reliability and sourcing with price stability.

CWF: Do you see any merit and potential for the four western provincial governments to approach energy policy in a more coordinated manner, thinking of total energy resources as "western," rather than solely within the realm of individual provinces?

GH: Certainly. In fact, at their annual meeting in 2003, the western premiers and territorial leaders passed a resolution requesting that their energy ministers organize themselves to develop a strategy for development of western energy resources. The energy ministers signed an MOU at their meeting in Winnipeg in May 2005, which established a Western Energy Alliance (WEA) and which set out six objectives of cooperation:

1. improve coordination and cooperation in the evaluation and approval of energy development projects;
2. examine opportunities for regulatory approval efficiency and regulatory harmonization;
3. develop shared recommendations on regulatory matters and, where appropriate, share these recommendations with the Government of Canada;
4. foster joint initiatives that support energy research, innovation and efficiency;
5. develop a shared approach for communicating with Canadians, North Americans and others on the importance of this region as a secure energy provider and source of energy expertise; and,
6. cooperate on establishing a substantive participatory role for provinces and territories in international energy discussions and negotiations.

Manitoba has chaired the WEA this past year and marketing events are planned for Toronto and Washington next year.

CWF: Should a western power grid (i.e., moving electricity across the Saskatchewan-Alberta border) be a priority for governments right now? Or is this not a significant issue?

GH: Existing transmission interconnections between Ontario, Manitoba, Saskatchewan and Alberta are extremely weak. There is no capacity for significantly increased power transfers between or amongst these jurisdictions. As long as coal fired generation remains lower cost than hydropower imports, it is unlikely the east-west grid will be strengthened in the near future through market

forces. It is interesting to note that there were discussions between Alberta and Manitoba in the 1980s to develop a western power grid, but these did not lead to any new development.

CWF: Could the value of western energy exports to the US (including oil, natural gas, and hydro) be compromised by a possible downturn in the American economy? How worried should westerners be about that?

GH: I cannot comment on oil and gas exports, but in the case of electricity, large export contracts are usually for 20 or more years. Contracts usually provide for price adjustments, which adjust prices by one or more indices such as the CPI. Short-term power transfers have significant value to both Manitoba and its export customers for reliability, diversity exchanges, and meeting near-term power fluctuations.

CWF: What role, if any, do you see western Canadian energy playing in Ontario's long-term energy strategy?

GH: Ontario is facing a 25,000 MW power supply shortfall in the next 20 years. Its alternative supply options include continued coal generation, nuclear refurbishment or new nuclear, wind, hydro imports and demand-side management programs. It appears the government is aggressively pursuing all options including imports. Ontario has been holding discussions with Newfoundland and Labrador, Quebec and Manitoba for new supply. Manitoba and Newfoundland and Labrador electricity imports could be as much as 6,000 MW in total. There is the possibility of supplying even more power from western Canada if the transmission grid was strengthened. I believe western oil and gas will continue to be an important part of Ontario's energy supply.

CWF: Which of the two do you see as more important in terms of balancing future energy supply and demand: conservation or alternative energy development?

GH: Energy conservation offers the greatest immediate opportunity for reducing energy demand. Energy retrofits of existing housing stock – both commercial and residential – in combination with more stringent energy building codes for new buildings could have a significant impact. Rising fuel costs will impact future products offered on the market, such as more fuel efficiency vehicles, downsized vehicles, and hybrid vehicles that will contribute to reduced energy demand. Development and commercialization of alternative energy such as wind turbines, biofuels, ground-source pumps (for heating and cooling), solar and hydrogen will also become part of the energy supply basket, but fossil fuels will become even more important in the future. It is obvious that we need to conserve our existing energy and find other sources of supply especially when world demand is increasing so rapidly.

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Treaty 8 British Columbia and Resource Development

by Chief Liz Logan, Fort Nelson First Nation

Projected increases in demand for natural gas have led the Province of BC to encourage the energy sector to explore, construct and operate more wells, pipelines and roads in northeast BC (NEBC). The land is crisscrossed by seismic lines and dotted with clearings from well sites, compressor buildings, meter stations, camps, roads and pipelines. There are flare stacks and rigs everywhere. There have been 16,850 wells drilled in NEBC from 1945 to 2002. Oil and gas development is changing the landscape and communities in NEBC.

We know that oil and gas development is good for the creation of jobs, good for the government and industry revenues, and we admit that it has even been good in many ways for First Nations. These projects present unique and unprecedented opportunities for further economic development of our communities. These nations and their members are involved in the oil patch in many ways that provide training, jobs and business opportunities.

However, this growth in activity has not come without costs. The impending cumulative impact of this increased development has had a profound and permanent impact on six First Nations in NEBC: Doig River First Nation, Fort Nelson First Nation, Halfway River First Nation, Prophet River First Nation, Saulteau First Nation, and West Moberly First Nation. These Six First Nations are signatory to Treaty No. 8, which was signed on June 21, 1899.

Treaty 8 covers two other provinces and one territory; in BC, the treaty covers all of northeast BC – about one third of the province. The BC portion of Treaty 8 is mostly forested lands, rich in oil and gas and other mineral resources. Opening up of the land for development was one of the reasons why the Crown signed such a treaty. Hence, Treaty 8 land in BC has been the target of large scale development.

The treaty guaranteed various rights to the signatory First Nations. Among these rights is the positive duty of governments to consult with First Nations on decisions that affect their treaty rights, and to seek a workable accommodation between the interests and objectives of First Nations and the objectives of the Crown and involved third parties.

The Six First Nations:

- are not opposed to the economic development of their territories;
- are opposed to any development that ignores or gives only token consideration to their treaty rights and interests; and
- are opposed to any development that does not bring significant, reliable and long-term benefits to their communities.

Based on these facts, the Six First Nations expect that construction and operation of all projects will be governed by the following principles:

- projects will respect the rights we hold under Treaty 8;
- projects will proceed in meaningful partnership with our communities; and
- projects will proceed in a manner that upholds the honour of the Crown.

Respect

The general area where oil and gas development is taking place is of critical historical and contemporary importance to the Six First Nations. We have historically used the land in the exercise of our traditional mode of life. Many of our community members still rely on the land for trapping, to provide fish and game to support their families, to gather berries and traditional medicines, and to pursue other necessary incidental activities. There are traditional trails, campsites, gravesites, traditional grazing areas, old settlements, and trapper cabins in NEBC.

The importance we attach to these matters cannot be understated. The land base available to our communities and members for the exercise of our treaty rights has been steadily diminishing since the treaty was signed, to the point where little is now left to us. All projects risk destroying sites of significant concern to our members, including various critical community use areas. Projects affect the exercise of our traditional mode of life, and facilitate additional access to others. These projects therefore constitute a prima facie infringement of our treaty and Aboriginal rights.

The Six First Nations therefore require a distinct consultation process directed to our own interests and concerns, separate from existing public processes. The purpose of this process would be to identify the full scope and nature of any infringements, determine whether such infringements can be avoided altogether, and ensure that any justified infringements are mitigated or compensated for.

We note further that no social, economic or environmental impact assessments with relevance to us on the particular and cumulative effects of the proposed projects through Treaty 8 British Columbia have ever been undertaken.

Partnership

As stressed previously, the Six First Nations are not opposed in principle to the economic development of our territories. We do however insist that development be done in a sustainable manner; and we insist that the construction and operation of projects in Treaty 8 British Columbia must provide significant, reliable and long-term benefits to our communities. Such benefits can, however, be realized only through meaningful partnership with industry and governments at all stages of the process. Most, if not all, the Treaty 8 First Nations have partnerships with industry. For example, a few of the Nations own big construction companies, and another owns 50% of a rig. The days, we hope, are over where industry and governments view First Nations primarily as obstacles to be ignored or manipulated, and rather as potential and valuable partners. Any partnership, therefore:

- must be based on mutual respect, consultation and sharing of information;
- must not be based on the perceived need to manage a potential legal impediment; and
- must involve an equity or equivalent interest.

Honour

Our inability to participate meaningfully can serve only to endanger our rights, reduce our opportunities and delay the process of project approvals. The situation as it stands is of benefit to no one with a serious interest in the projects.

It must be stated again that the honour of the Crown is always at stake in the relationship between governments and First Nations. We must therefore assume that repeated commitments are made in good faith, with the intention that they would be acted upon fully and in a timely manner.

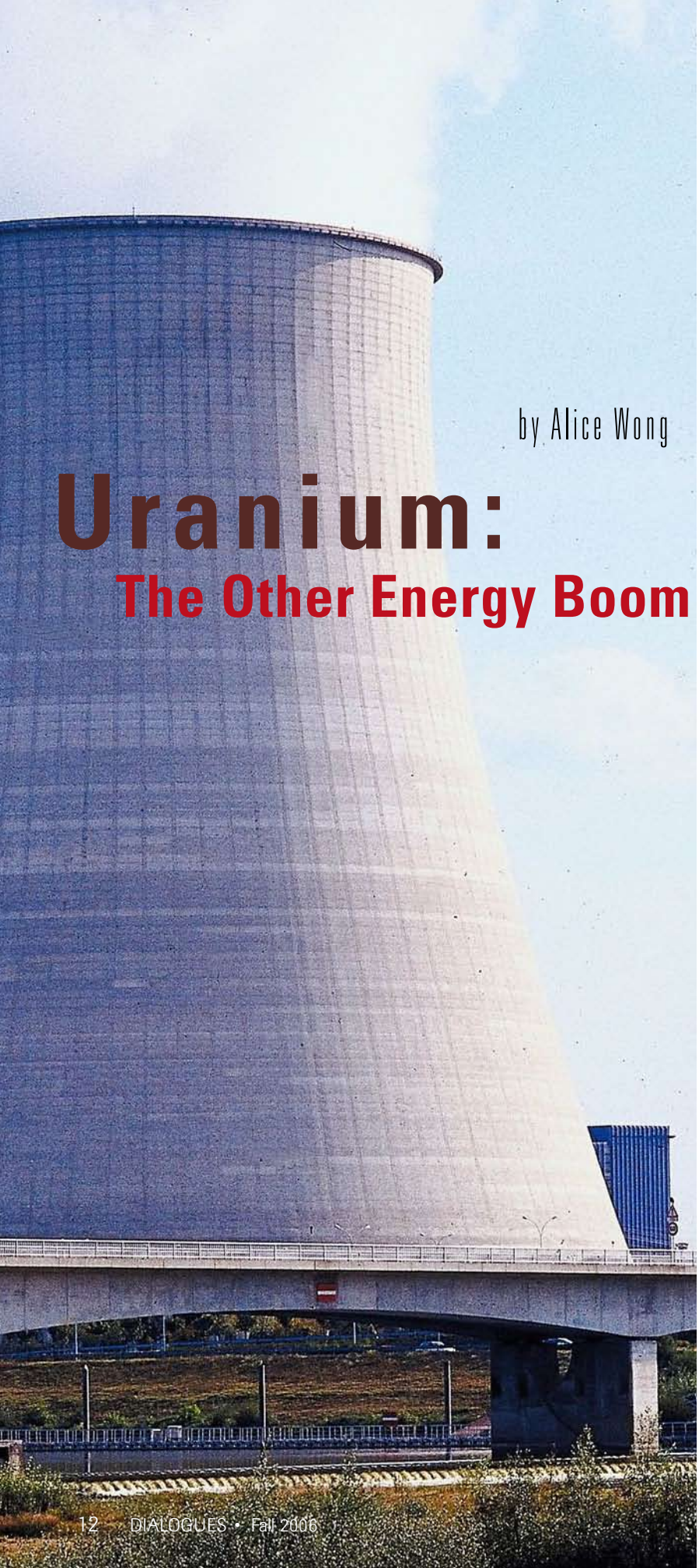
For example, the Government of Canada has committed over $30 million to help Aboriginal groups and communities prepare for the Mackenzie Valley pipeline, while it refuses any assistance to British Columbia Treaty 8 First Nations along the Alaska Highway pipeline route. It is not honourable that the rights, interests and opportunities of the BC First Nations be endangered for what appears to be a view held by Canada and industry that additional political and economic benefits can only be derived from the immediate construction and operation of the Mackenzie line.

Conclusion

The Six First Nations are prepared to engage all interested parties in meaningful discussions with respect to all proposed projects.

We call on all interested parties to ensure that projects move forward in a manner that will respect our treaty rights, value our partnerships and create sustainable, reliable and lasting benefits to all concerned.

Liz Logan is the Chief of the Fort Nelson First Nation in northeastern British Columbia



by Alice Wong

Uranium:
The Other Energy Boom

The Alberta tar sands are not Canada's only massive storehouse of energy.

Locked in the rocks of northern Saskatchewan are the world's richest reserves of uranium, the fuel for nuclear power plants that now provide about 16% of the world's electricity.

The source of this mineral wealth is the Athabasca Basin, a 100,000 square kilometre disc-shaped formation of ancient sandstone that stretches from Wollaston Lake in the east to just across the Alberta border in the west. Uranium occurs primarily at the interface between the sandstone and older underlying rocks along faults and shear zones that once channeled flows of groundwater. The formation is about 2,000 metres thick in the centre and tapers to less than 50 metres at the edges.

The Athabasca Basin has produced the world's richest uranium finds with average ore grades up to an astonishing 24%, more than 100 times the world average. Most of the major finds have been at the eastern edge of the basin.

Three active mines in this area operated by Cameco and France-based AREVA Resources now account for about 30% of world uranium production, making Canada the leading producer. Canada's share of world production will increase dramatically as production from Cigar Lake, expected to begin early in 2008, ramps up in the years ahead. In terms of energy content, identified reserves in the basin contain enough energy to meet Canada's total electricity needs for more than 20 years and there's potential to find a lot more.

The first major discovery of high-grade ore on the basin occurred at Rabbit Lake in 1968, followed by Cluff Lake in 1970 and Key Lake in 1975, each leading to development of mining and milling operations.

This phase of exploration, fuelled by tremendous optimism in nuclear power and rising prices, was focused on finding uranium near the surface that could be mined using low-cost open pit techniques.

Geological models developed during this period indicated that ore was likely to be found at greater depth with no surface expression.

The new thinking led to application of advanced techniques in airborne and ground-based geophysics that allowed geologists to look deeper into the earth and better target their drilling activity. The results were exceptional. The 1980s saw discovery of the McClean, Midwest and Sue deposits as well as extraordinarily rich deposits at McArthur River and Cigar Lake with combined reserves of more than 620 million pounds of uranium. It is these discoveries from nearly 20 years ago that support Canada's position as the world's leading uranium producer.

The wealth of Canada's uranium resources has not been widely recognized because the richest deposits were found just as the fortunes of nuclear energy went into a sharp decline. During the 1980s, reactor construction stalled as electricity demand fell short of forecasts. Large stockpiles amassed by utilities during the 1970s and 1980s and the arrival of recycled uranium from decommissioned Russian weapons, depressed uranium markets and pushed prices down to an historic low of $7 US a pound in 2000.

Today, nuclear energy is on the rise again, but this time, market fundamentals are solid. Driven by environmental, economic and energy security concerns, interest in nuclear power is reviving around the world. Ambitious reactor construction programs are under way in Asia, where the strongest growth in electricity demand is forecast.

In Canada, the US and the UK, governments have recognized that nuclear power is a necessary part of a sustainable electricity supply for the future and are moving toward construction of a new generation of nuclear power stations. Even European countries that had decided to phase out nuclear power are revisiting the decision.

Over the next decade, the number of reactors in operation is expected to increase to more than 500 from about 440 now. Providing fuel for the world's growing fleet of reactors is a significant challenge for the industry. Exploration and mine development was severely hindered by the extended period of weakness in uranium markets. As a result, there is a gap between supply and demand that clearly points to the need for new mine production over the decade. This will be be filled in part by projects currently under development, including Cameco's Cigar Lake and Inkai projects. But there is no doubt that additional new production will be required beyond what is already in the queue.

The industry fully expects that new reserves will be found to sustain growth in nuclear power generation. Soaring prices have fuelled a boom in exploration activity that is being felt around the world, and particularly in Saskatchewan where more than 43 companies are actively searching for new deposits. The last exploration rush during the 1970s and early 1980s found enough uranium to sustain the world's nuclear generating stations for nearly three decades and technology has improved dramatically since then.

Saskatoon-based Cameco, the world's largest producer, is at the forefront of the current uranium hunt on the Athabasca Basin. Formed in 1988 through the privatization of Eldorado Nuclear Ltd. and the Saskatchewan Mining Development Corporation, Cameco has more than 60 years of operational experience in the region and has built up an exceptional land position. As one of few companies that sustained its exploration efforts during periods of weakness in uranium markets, Cameco is well positioned to add to its current reserves of more than 520 million pounds.

> "Identified reserves in the basin contain enough energy to meet Canada's total electricity needs for more than 20 years and there's potential to find a lot more."

Cameco is involved in more than 30 exploration projects on the basin through its own activities and joint ventures. It operates about 75% of its exploration projects and holds a diversified portfolio of interests in other projects with the right to own or earn a controlling interest in most. The majority are early to middle-stage exploration where indications of economic grades or quantities of uranium have yet to be identified. In 2006, Cameco is investing $34 million in exploration as part of a long-term strategy to maintain a leadership position in uranium production.

Cameco's board and management are fully committed to nuclear energy and have defined a vision to be a dominant nuclear energy company producing uranium fuel and generating clean electricity. The company is involved in all stages of the fuel cycle in Canada from exploration through to electricity generation and is actively looking for acquisitions to expand its position. With the world's most prolific uranium producing area in its backyard, it is well positioned to achieve its goals.

Alice Wong is Vice-President, Investor, Corporate and Government Relations with Cameco (www.cameco.com).

Paving the Path to a Global Goal:

The Federal Role in the West's Energy Future

by Roger Gibbins

During his international tour in July, Prime Minister Stephen Harper described Canada as a "new energy superpower" and then went on to discuss his government's intention to build Canada into a "global energy superpower."

Harper not only stressed our vast energy endowment but also the security of supply that Canada can offer in a turbulent world.

Although Harper's comments were pitched to an international audience, and particularly to his G-8 counterparts, they warrant close attention back home.

The first thing to note is that the Prime Minister pitched Canada's energy potential in very broad terms, noting not only oil and gas reserves but also coal, hydro and uranium. Given the media focus on Alberta's oil sands, it is good to see Harper taking a much broader perspective that embraces the full range of energy opportunities across the West.

The second point to note is that, with the possible exception of uranium resources, Canada's global potential is tied heavily to North American markets. We may well be global in scale, but not in reach given the difficulty of moving many forms of Canadian energy off the continent. At least in the foreseeable future, we could indeed be a global player, but within a continental arena.

In this context, Harper and Russian President Vladimir Putin also discussed the possibility of a liquefied natural gas port in Quebec, but one designed for the importation of Russian natural gas to serve North American markets rather than for the export of Canadian natural gas.

The third and perhaps most important point to note is Harper is clearly beginning to map out a role for the federal government in making Canada into a "global energy superpower." His speeches are not mere boosterism; they are setting the table for federal policy initiatives.

This, however, should not be reason for western Canadians to chant "no more NEP" as they reach into their closets for their muskets. Harper is unlikely to be reckless given his own and his party's deep roots in the region. Harper will also be constrained by his belief in a new "open federalism" that would be more respectful of provincial areas of jurisdiction, and by his adamant support for the primacy of markets.

All of these reasons should provide western Canadians with adequate assurance that the Prime Minister is not harbouring confiscatory goals; this is not 1980 and the Pierre Trudeau government all over again.

Nonetheless, a national energy strategy or framework, if not necessarily a new national energy program, is now on the table, and I would argue that western Canadians should welcome this initiative.

An active federal role could help address some of the interfaces among energy sources that market mechanisms do not address all that easily. Moreover, it could be of great assistance in helping to pave the way for the infrastructure projects that are essential if indeed Canada is to become a global energy superpower.

For example, it is difficult to imagine much if any headway being made on such projects as the Mackenzie Valley gas pipeline or a liquefied natural gas port without the federal government running interference by providing moral suasion, political muscle and, at the margins, financial support.

And, as noted above, developments in Canada will depend very much on managing the Canadian-American relationship, and this is an area where the government of Canada has an essential and unavoidable role.

The hope, therefore, is not that the federal government will revert to market intervention. Instead, the hope is that it will play an important role in strategic integration across many different forms of energy production, and in the vast infrastructure projects that come hand in glove with market development.

In addition, the federal government could play a hugely important role in research and development with respect to alternative energy supplies, and in the commercialization of the research results.

Canada can be a truly global leader on the research side, not just with the supply of conventional energy sources. We have an opportunity for leadership in such fields as coal gasification, ethanol and wind power.

For all of these reasons, Harper's recent comments should be applauded. In fact, anything less would be tantamount to a dereliction of duty on the part of the national government.

There is a great deal that Canada can achieve, but we will not reach our full potential without the constructive engagement of the Government of Canada.

The ghosts of 1980 should not distract us from tomorrow's potential.

Dr. Roger Gibbins is President and CEO of the Canada West Foundation.

Unlikely Celebrity:
CO_2 EHR in the Spotlight

by Sarah-Jane Downing

With everyone from politicians to movie stars shining a spotlight on the issue of climate change, carbon dioxide (CO_2) has become something of a notorious celebrity. One of the best known greenhouse gasses, CO_2 derives from several natural sources such as the combustion and decay of organic matter and aerobic respiration. It is widely agreed that the release of additional carbon dioxide into the atmosphere, through the burning of fossil fuels, has produced climate change that, if continued unchecked, is predicted to result in severe environmental consequences. The recent public interest in CO_2 doesn't sound like good news for western Canada's booming oil patch, which is still centered on the production and burning of fossil fuels, but forward-thinking members of the energy industry are working to turn this B-list bad boy into a profitable A-list star through a process called CO_2 Enhanced Hydrocarbon Recovery.

CO_2 Enhanced Hydrocarbon Recovery, known as CO_2 EHR in the energy industry, is a method of using liquefied carbon dioxide to produce more crude oil or natural gas from wells nearing the end of their viable commercial production. Currently, conventional production methods extract only 27% of conventional oil and 60% of conventional gas from a well during its lifetime, leaving significant quantities of these valuable commodities trapped underground. However, CO_2 may be the key to unlocking these resources. When liquefied CO_2 is injected into a mature oil well, it combines with the remaining trapped oil to form a free-flowing solution that can be brought to the surface. Although some of the injected CO_2 is released with this fluid, the majority is either recaptured and re-injected for more enhanced recovery or is permanently trapped in the reservoir beneath impermeable rock formations. Injecting CO_2 into a conventional natural gas field increases the reservoir pressure, displacing remaining natural gas to the surface. Enabling oil and gas producers worldwide to capture these previously inaccessible resources could bring billions more barrels of oil and significant natural gas into the marketplace, while simultaneously reducing greenhouse gas emissions by sequestering CO_2 within formations deep underground.

The injection of CO_2 to enhance hydrocarbon recovery is not a brand new technology developed in response to recent environmental concern. In fact, CO_2 injection was first attempted on a commercial scale in 1972 to increase the production of an oil well in Scurry County, Texas. Since this pioneering effort in the United States, CO_2 injection has been used successfully south of the border for over 30 years as a means of increasing the recovery of oil and extending the commercial life of the fields. In Canada, there are ongoing commercial CO_2 EHR schemes at Weyburn, Saskatchewan and Joffre, Alberta, with numerous pilot projects recently initiated in Alberta. The use of CO_2 EHR to aid in the fight against global warming builds upon these technologies, successfully applying them towards the new goal of facilitating emissions reduction. The largest scale commercial CO_2 EHR project in Canada (Weyburn) uses an amount of CO_2 approximately equivalent to taking the exhaust from 100,000 cars.

CO_2 used in EHR must be captured from either natural or industrial sources, compressed, and injected. Historically, the use of CO_2 from industrial sources, such as refineries or power plants, has not been widely adopted for EHR application because the capture costs outweighed the profit from additional oil or natural gas. However, the combination of rising oil and natural gas prices, predictions of waning oil and gas supply over the next half-century, and increasing public concern over global warming has created an ideal climate for producers to explore the large scale recovery of CO_2 from industrial sources for use in CO_2 EHR.

Despite excitement over the deployment of CO_2 EHR, especially employing CO_2 from industrial sources, there remains much debate regarding whether it is economically feasible in both the long- and short-term. While more effective and economical methods are being developed, capturing CO_2 from industrial sources is currently very costly. Costs are compounded by the lack of pipelines to transport the CO_2 from these industrial sources to the oil and gas fields where it can be injected. In addition, more injection wells in the field must be prepared and equipment must be improved to withstand the

Sarah-Jane Downing is the Innovation, Technology, and Communications Coordinator with the Petroleum Technology Alliance Canada (PTAC), based in Calgary. PTAC is a not-for-profit organization. Its goal is to facilitate innovation, technology transfer and collaborative R&D in the western Canadian upstream oil and gas industry, and to improve the environmental, safety, and financial performance of the industry. Visit www.ptac.org for more information.

corrosive properties of CO_2. This is a tall order just to get things up and running.

So, how much potential oil and gas are we really talking about in western Canada? It is uncertain exactly how much can be reclaimed from beneath the ground, but researchers estimate that widespread deployment of CO_2 EHR could unlock several hundred million barrels of oil and significant quantities of natural gas. That translates to extended energy supply, increased profits, and additional public revenue in the form of royalties and tax benefits. In short, a strengthening of the western Canadian economy.

"It is uncertain exactly how much can be reclaimed from beneath the ground, but researchers estimate that widespread deployment of CO_2 EHR could unlock several hundred million barrels of oil and significant quantities of natural gas.

Field pilots and a few commercial EHR and pipeline projects are laying the groundwork for more extensive commercial implementation of CO_2 EHR in western Canada. However, collaborative research into determining more economical implementation solutions and developing new technology is needed to accelerate widespread deployment. PTAC Petroleum Technology Alliance Canada, a not-for-profit association facilitating collaborative research in upstream oil and gas, has brought together a committee representing both industry and government. This committee is currently working on launching a project to estimate the availability and costs of capturing high purity CO_2 being vented in the Fort Saskatchewan area, and using it to support the initiation and ongoing operation of commercial enhanced recovery of conventional oil in the Pembina and Swan Hills fields. The committee is hopeful that this study will eliminate some of the ambiguity around the high costs that keep many producers from embracing CO_2 EHR.

As the current western Canadian economy flows with profits generated by some of the highest oil and gas prices of the last 25 years, and public concern remains focused on global warming while declining oil and gas reserves loom, one thing is certain: CO_2 EHR will not be out of the spotlight anytime soon.

Image courtesy of Suncor Energy Inc.

BC's Untapped Offshore Potential

by Richard Neufeld

As the demand for energy rises, British Columbia is emerging as a vital player in the global energy picture. Our oil and gas industry generated $2.6 billion in provincial revenue in 2005 – the highest in the resource sector. The revenues are invested in health care, education and many other government programs. But a large portion of BC's energy potential remains untapped beneath the waters of the Pacific Coast.

Offshore oil and gas facilities are bringing new sources of energy to market on the Atlantic Coast. Similarly, BC's offshore resources have the potential to help meet the ever-increasing demand for energy. We continue to work with the federal government to lift the existing moratorium and proceed with developing this resource, provided that it can be done in a scientifically sound and environmentally responsible manner.

The Resource

BC's offshore oil and gas resources are located in four sedimentary basins: Georgia, Tofino, Winona and the Queen Charlotte. A 2001 study by the Geological Survey of Canada estimated total median in-place resources of 41.8 Tcf (trillion cubic feet) of gas and 9.8 BBbls (billion barrels) of oil for the four basins. The value of those resources has been estimated at up to $60 billion US and $50 billion US, respectively.

The Queen Charlotte Basin is thought to be the most prospective, as it contains the largest reserves and has the best known geology. Its exploration dates back to 1913 when the BC Coal Company drilled for oil on Graham Island at the site of a natural oil seep, but exploration off the BC coast is actually quite limited. Shell Canada conducted 32,000 kilometres of seismic testing (the method by which oil and gas deposits are detected) in the 1960s and drilled 14 offshore test wells in 1967 and 1968 . Six test wells were drilled in the Tofino Basin and eight in the Queen Charlotte Basin with a drilling rig constructed in Victoria. Commercial quantities of oil or gas were not found. Chevron Canada conducted an additional 6,225 kilometres of seismic in the 1970s, but a proposed drilling program was cancelled following the 1972 announcement of a federal government moratorium on offshore exploration and development.

The Moratorium

The 1972 moratorium was essentially a federal cabinet decision that no work would be allowed on exploratory leases issued for the Winona, Tofino and Queen Charlotte Basins that dated back to the 1960s. The permits required holders to undertake work within the permit area, but the moratorium relieved permit-holders of those obligations. The BC government followed suit that year with a policy against offshore oil and gas exploration and development. But the provincial and federal governments agreed upon a joint environmental assessment process in the early 1980s for a seismic survey and test well program proposed by Chevron Canada for the Queen Charlotte Basin with the understanding that the agreement was not a lifting of the moratorium.

In 1986, a joint federal and provincial West Coast Offshore Exploration Environmental Assessment Panel concluded that an exploration program could proceed subject to a list of 90 recommendations. BC began negotiations with the federal government on a Pacific Accord, similar to the Atlantic Accords the Government of Canada negotiated with Newfoundland and Nova Scotia. But the 1989 Exxon Valdez oil spill in Prince William Sound and a subsequent leak from an oil barge off Washington State saw the BC government announce a five-year moratorium, which effectively remains to this day. Likewise, the federal government confirmed that it would continue its moratorium until approached by the Province of BC.

Recent Events

Elected with the goal of unleashing the province's energy potential, the provincial government commissioned a pair of scientific studies in 2001 to get offshore exploration back on track. Both scientific studies concluded that there is no scientific reason to maintain the moratorium. The Offshore Oil and Gas Task Force conducted extensive public consultation in coastal and northern communities, and found that British Columbians wanted more information as well as a role in future activity.

At BC's request, the federal government reconsidered its moratorium by initiating a three-part review in 2003. The Royal Society of Canada's scientific panel concluded the following year that there were no science gaps that needed to be filled before lifting the moratorium. A review panel found that public opinion was divided, and while a First Nations engagement process found opposition to lifting the moratorium, there was room for progress if First Nations were involved in the decision-making process.

Numerous other scientific studies have found that there are no scientific reasons for a blanket moratorium on offshore oil and gas development off the West Coast:

- 1998 - AGRA Earth and Environmental Ltd. found that significant technological advancements had been made to minimize risks associated with offshore oil and gas development.
- 2001 - Jacques Whitford Environment Ltd. completed an offshore oil and gas technology report for the Ministry of Energy and Mines, and concluded that "…there are no unique fatal flaw issues that would rule out exploration and development activities."
- 2002 – The Dr. David Strong report (scientific panel) concluded that "there is no inherent or fundamental inadequacy of the science or technology, properly applied in an appropriate regulatory framework, to justify a blanket moratorium on offshore oil and gas activities."
- 2004 – The Royal Society of Canada panel chaired by Dr. Jeremy Hall concluded that "provided an adequate regulatory regime is put in place, there are no science gaps that need to be filled before lifting the moratoria on oil and gas development."

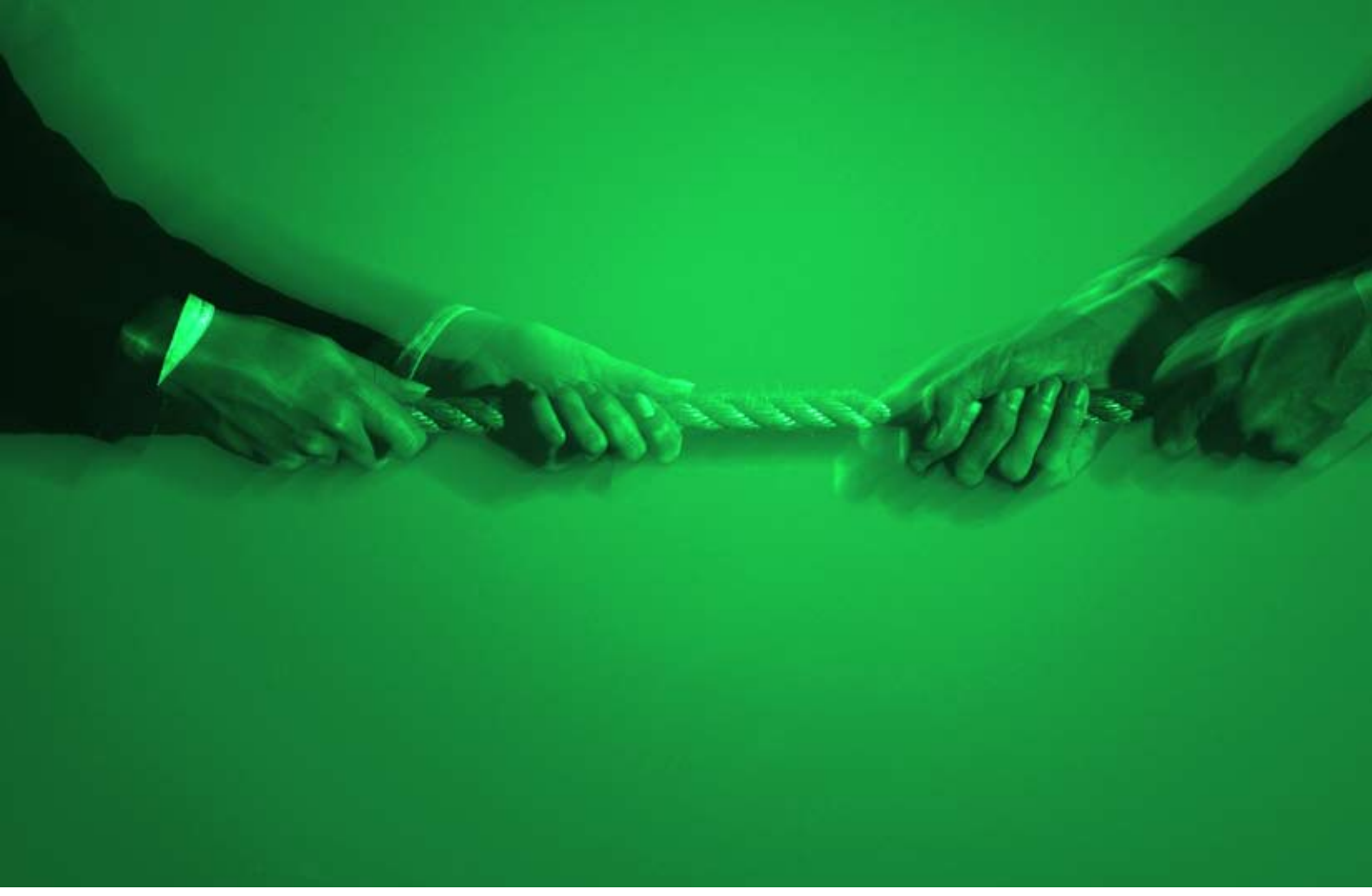
Conclusion

The offshore industry is transforming the provincial economy of Newfoundland and Labrador. Likewise, the development of BC's offshore oil and gas resources is a great potential economic opportunity for the province that would bring new investment, increased trade and continued economic growth.

Since 2002 we have encouraged the federal government to lift its moratorium and to work with us to establish fiscal, regulatory and management arrangements for renewed activity. We have invested in research and have teamed up with universities to establish baseline environmental data. In June, we announced funding to assist the Nisga'a Nation to learn more about the industry.

We believe that leading-edge research and technology can ensure we can explore our offshore resources in a scientifically sound and environmentally responsible manner. In fact, it is the only way we will proceed. For as much as we are a global energy supplier, British Columbia's goal is to lead the world in sustainable resource management. We are achieving that as we develop resources beneath the land, and we will continue to achieve that as we harness the potential just off our shores.

Richard Neufeld is the BC Minister of Energy, Mines and Petroleum Resources.



Energy and Sustainable Natural Capital:
Can Alberta Have it Both Ways?

by Elizabeth Wilman

The basic idea of sustainability is that we should manage our planet as if we and our descendants intended to stay. We should not waste its resources, and we should ensure that future generations can achieve the same level of well-being as do we.

The natural resources of our planet are typically referred to as natural capital. We use natural capital to contribute to our well-being. Oil and gas are nonrenewable capital resources that are used to produce the energy that we use on a daily basis. Outdoor environments are used for recreational enjoyment and ecological systems act as life support systems. Using or enjoying natural capital does not use it up immediately, but non-renewable resources can be exhausted. Renewable resources can be built up through natural growth and drawn down through use. Ecosystems can be degraded.

Other forms of capital can substitute or complement natural capital in satisfying our needs and wants. These include human capital (knowledge, skills, culture and institutions), and man-made or manufactured capital (roads, factories, computers). These can be built up through investment and drawn down through depreciation. All three types of capital are used to enable us to meet our needs and wants, and if we want to sustain human well-being at an acceptable level, we need to sustain the capital that supports that level of well-being. This idea is formalized in the Hartwick rule,

named for Canadian economist John Hartwick, which says that constant consumption can be maintained through time if all of the profits from the exploitation of a non-renewable resource are invested in other forms of capital.

"For Alberta to maintain its material standard of living as it draws down its stock of non-renewable energy wealth, it must invest in other forms of capital to maintain the overall capital stock and the consumption level of its citizens."

For Alberta to maintain its material standard of living as it draws down its stock of non-renewable energy wealth, it must invest in other forms of capital to maintain the overall capital stock and the consumption level of its citizens. This can take the form of investment in new technologies to extend the life of existing natural resource stock, or investments in different forms of capital. For example, investments in education increase the stock of human capital, and investments in research can expand technological capabilities. These can enable us to exploit our energy resource stocks more efficiently, reduce the negative impacts on other natural capital, or to substitute other forms of capital.

In 1976, the Alberta Government began the Heritage Fund by depositing 30% of annual oil and gas royalties into it. Money from the Heritage Fund was invested in parks, libraries, forest management, education, health care, and research related to health and renewable energy. However, through the years investment in the fund has declined. It was only earlier this year that the Government of Alberta agreed to inject revenue into the fund for the first time since 1987. One way to move back to a more sustainable path is to return to the pattern of savings and investment exhibited in the early years of the Fund.

Not all issues surrounding sustainability can be addressed by reinvestment of resource revenues, although there may be more scope for this than is at first realized. Perhaps we can reduce net CO_2 emissions through investments in geological storage. While there is a great deal of potential for permanent storage, further assessment of the technical requirements for safe storage is necessary. In addition, there is a need to develop an institutional framework to encourage companies to go to the trouble of separating and storing CO_2. An example of such an arrangement is Norway's carbon tax. The Sleipner natural gas field, in the North Sea off Norway's coast is operated by Statoil, who separates the CO_2 and pumps it back underground, to avoid paying the tax.

Another important question that arises is that of how far one can push substitutability and technological improvements. Alberta contains a number of landscapes and ecological resources for which other forms of capital are not good substitutes. Extracting non-renewable energy resources can degrade these forms of natural capital. Restoring ecosystems to their natural state is not easy, and sometimes it is impossible. Ranchers on the Eastern Slope of the Rocky Mountains rely on rough fescue for their cattle, a very deeply rooted native grass. If the land is disturbed – for example, by road-building or resource extraction – rough fescue's root system is nearly impossible to re-establish.

In another example, mining of Alberta's oil sands involves deep, open pit mines that create huge scars on the land. Investments in reclamation are being made. Syncrude, for example, has restored an old mine site to the point that it supports buffalo and deer. But, it is questionable whether such reclamation is complete and whether it can be done on as large a scale as would be required. Canada's boreal forest, one of the largest remaining forest ecosystems in the world, is being fragmented by seismic lines, roads and pipelines and other forms. Species which require intact old growth forests, such as woodland caribou, face declining habitat as a result these activities. Protecting this species means protecting large areas of old growth boreal forest.

So, what does sustainability mean in the context of energy production in Alberta? First, it means investing the profits or royalties from non-renewable resources in ways that enable us to more effectively exploit our energy resource stocks, reduce negative impacts on other natural capital and/or build up other capital stocks through investments in education or research. Second, it means that the set of eligible investments should include a broad range of options, including those that would reduce negative environmental impacts of fossil fuel production and combustion, but should be limited to investments which will make future generations better off. Finally, it should be recognized that there is a limit to the substitutability of capital. Some landscapes and ecosystems must be protected if they are to contribute to future well-being.

Dr. Elizabeth Wilman is Professor of Economics and Head of the Department of Economics at the University of Calgary. She has published numerous papers in the general area of environmental issues such as global warming and the preservation of biodiversity.

Finding the Petroleum Needle in the Haystack:

Innovative Ideas in the Oil and Gas Sector

by Greg Stringham

Discovering a crude oil or natural gas deposit deep underground is a lot like trying to find a needle in a haystack. Fortunately, high tech tools like 3D imaging are making the job of pinpointing buried hydrocarbons a little easier.

By necessity, Canadian companies have become world leaders in finding innovative ways to explore for and produce oil and gas. Technological advances from horizontal drilling enabled by global positioning systems to computerized subsurface 3D modeling are increasingly employed by Canadian companies in the search for new pools of oil and gas – pools that tend to be smaller and found in more remote and/or challenging locations than in the past.

Companies are finding innovative ways to use steam, carbon dioxide and other agents to get more of the petroleum that is found out of the ground and to consumers.

The ability to effectively and efficiently apply advances in technology has always been critical to the success of the oil and gas industry. This has not come easily. The oil sands in northern Alberta are now a world-scale marvel of engineering, but many critical aspects of the recent accomplishments date to the 1920s when Karl Clark first experimented with ways to separate oil from oil sands with hot water and chemicals at the Scientific and Industrial Research Council of Alberta. Eight decades later, heavy oil and bitumen are vital to the global energy supply.

Recently, exploration, development and production technologies have improved to the point where industry now produces reservoirs that were technically or economically unfeasible even a few years ago Consider two examples of technology at work: the Boreal region and using CO_2 for enhanced oil recovery (EOR).

Operating in the Boreal Region

Innovation lessens the environmental impacts on the northern forests. To better protect the Boreal Region, oil and gas companies constantly reassess their operational practices, utilizing new technology and forging new partnerships to improve the stewardship of the land.

"Exploration, development and production technologies have improved to the point where industry now produces reservoirs that were technically or economically unfeasible even a few years ago."

In the last 15 years, producers have made tremendous strides to reduce the size of their "footprint" on the Boreal Forest. The industry has found ways to lessen its environmental impact by using helicopter portable seismic exploration, multiple well drill pads and horizontal drilling techniques.

"Canada needs a national energy framework, one that stresses the importance of energy to the economy and the importance of research and innovation.

Various new technologies, such as GPS equipment and world scale graphics and computing, enable companies to conduct exploration and seismic programs with greater precision and less disruption.

The industry uses low-impact seismic lines that leave a smaller imprint, reduce the width of the disturbance, avoid mature trees and in most cases leave the surface layer intact, minimizing the possibility of erosion and reducing the time to re-vegetate. Investments in new equipment and technology made these advances possible.

In the long-term, governments have specific requirements for industrial reclamation and standards are being developed to ensure that reclaimed landscapes are environmentally sustainable, meet regulatory requirements, and satisfy the needs and values of the stakeholders.

Using CO_2 for EOR

There are major projects using a new technology called CO_2 EOR in Saskatchewan and Alberta. There are two primary EOR methods: a water "flood" of the underground rock structure and the growing use of carbon dioxide (CO_2) floods. These EOR techniques increase oil recovery rates by 10-15%.

When oil is pumped from a reservoir, the natural pressure is depleted. Pressure helps to push oil to the well bore and then to the surface. To extract more oil once pressure is depleted, companies use EOR methods to maximize production. When CO_2 is injected into a well, traditionally after a water flood, it reacts to oil at high pressure and the oil becomes thinner and flows easier out of the well. There is also a major environmental gain as the CO_2, a greenhouse gas, is stored safely underground.

Major projects using CO_2 floods are operating in Weyburn and Midale in Saskatchewan and Joffre, Alberta. There are about 4,000 oil reserves in Canada with EOR potential. Once a long-term source of CO_2 is secured – the oil sands are the obvious option – and pipelines are in place, the technologies will help maximize oil recovery.

Although oil and gas companies spend millions searching for new reservoirs, they are also determined to recover more oil or gas from known reservoirs. With traditional technologies, producers can only recover about 25% of the petroleum in underground pools. Recently, companies have made significant strides with technological advances to produce oil or natural gas from reservoirs that even a few years ago were technically or economically unfeasible.

To put this into perspective, a 1% improvement in oil recovery rates in Canada would increase production by 1 million barrels day. That translates into an increase of approximately $4 billion in revenues for Canadian governments and more than $60 billion added to Canada's annual GDP.

The benefits of enhancing recovery of the country's oil and gas resources are immense for all Canadians. But the challenge of discovering those hydrocarbon "needles in a haystack" is just as immense and cannot be achieved fully without partnerships among industry, governments and the university sector.

There are tremendous opportunities for industry to cooperate with universities across Canada to support cutting-edge research. Industry is also looking to all levels of government to be partners in placing a renewed emphasis on research and innovation. Important initiatives already underway include the Scientific Research and Experimental Development tax credits, ongoing research into climate change, and a focus on innovation in the federal budget.

To focus all of these efforts, Canada needs a national energy framework, one that stresses the importance of energy to the economy and the importance of research and innovation. It is also critical to increase government focus on research, innovation and productivity.

Industry, universities and governments all have roles to play in the partnership to advance technical innovation to continue to unlock Canada's vast petroleum resources in a responsible and efficient manner for the benefit of Canadians.

Greg Stringham is the Vice-President, Markets & Fiscal Policy for the Canadian Association of Petroleum Producers (www.capp.ca), a position he has held since 1998.

From the Margin to the Mainstream: Western Canada's Wind Energy Opportunity

by Robert Hornung

A few short years ago, Alberta stood alone in western Canada in its pursuit of industry-scale wind energy development. From the province's first 19-megawatt (MW) wind farm, developed in 1993 near Pincher Creek, Alberta now boasts approximately 285 MW of installed wind capacity, and will be well over 350 MW by the end of 2006. Alberta is currently one of Canada's top wind energy producers.

Due to technological evolution over the past two decades, wind energy costs have dropped by 80%, making it increasingly cost-competitive with conventional forms of electricity generation. As a result, wind energy has moved from the margin to the mainstream in Canada. In fact, 2006 has been a banner year for wind energy in western Canada, with new projects installed in Alberta, Saskatchewan and Manitoba. By the end of 2006, more than 300 MW of new capacity will be in place in western Canada, representing a total investment of more than $600 million and providing a range of local economic benefits in the form of lease income to landowners, tax revenues to municipal governments, and new investment and jobs in rural communities.

British Columbia is now the only western province without installed wind capacity, a deficit soon to be rectified as the province recently awarded power contracts to three wind developers for a total of just over 325 MW. Prospects are good for further development across western Canada, as well. The Manitoba government and Manitoba Hydro plan to announce the details of a 300 MW Request for Proposals for wind power (part of its 1,000 MW wind strategy) before the year is out. Alberta has another 1,600 MW of wind energy awaiting transmission upgrades, and Saskatchewan – where wind energy currently provides 5% of the province's electricity – is considering its next steps in wind energy development.

Economic and environmental benefits

Wind energy has tremendous economic benefits, particularly in rural areas hard hit by declines in farm income and increased machinery fuel and fertilizer costs. Each MW of installed wind energy capacity represents approximately $2 million of investment and creates 2.5 direct and 8 indirect person-years of employment related to project development, manufacturing, construction, operations and maintenance. A significant portion of these dollars and jobs remain in the communities where wind projects are built. Wind energy developments also support long-term rural economic development by strengthening the municipal tax base and by allowing double use of agricultural land, with annual land lease payments of several thousand dollars per turbine (often referred to as a "second cash crop" by farmers and ranchers).

Robert Hornung has been the President of the Canadian Wind Energy Association (CanWEA) since August 2003 and he represents the interests of CanWEA's more than 250 corporate members in a variety of forums (www.canwea.ca). Mr. Hornung is also a Board Member of the Global Wind Energy Council.

In the Municipal District and Town of Pincher Creek, Alberta, for example, wind developers have invested more than $10 million directly into the local economy, hiring electricians, labourers, and crane operators; purchasing and renting equipment; and purchasing concrete, supplies, meals and more. Three wind companies now have head offices or field offices located in Pincher Creek, resulting in 21 new full-time jobs with a $1.4-million payroll. The municipality has received $900,000 in new taxes, and annual lease payments to landowners are estimated at approximately $3,000 per turbine. Even tourism revenue in the area has increased thanks to its turbines.

Wind energy development has also energized local industry in the West: Hitachi Canada Industries of Saskatoon, first subcontracted to manufacture turbine towers for SaskPower's Cypress Wind Power Facility and then SaskPower International's Centennial Wind Power Facility, is now delivering wind towers to projects across North America.

There are also significant environmental benefits to wind power. Wind turbine developments produce no greenhouse gas emissions, no acid rain pollutants, no smog, no hazardous chemicals, and no solid, hazardous or toxic wastes, and can therefore help reduce the damaging environmental impacts associated with most conventional forms of electricity generation.

Dispelling myths

Despite overwhelming evidence to the contrary, wind energy development has been dogged by myths concerning migratory bird deaths, noise issues and land use impacts. In fact, properly sited wind energy developments pose no significant threat to birds, with US studies showing death rates of only two birds per turbine per year, significantly less than annual bird deaths caused by predators or tall buildings. Environmental assessments of planned sites are a normal preliminary stage of any development, and take into account migratory flight paths, bird nesting sites, and more. Other pre-development studies include noise modeling to ensure appropriate setbacks from residential buildings, minimizing any noise impacts. In fact, a turbine's turning blades are relatively quiet: a normal conversation can take place directly beneath them. And compared to other types of energy production, wind farms use only about 1-3% of the land, and can co-exist quite successfully with other agricultural land uses.

Integrating wind into western Canada's electricity mix

In hydroelectric-powered Manitoba and British Columbia, electric utilities are beginning to recognize and act on wind energy's synergies with hydroelectric production. In the short-term hydro, being plentiful, can respond quickly to short-term wind variability, and provide load-following and firming reserve. In the long-term, wind is often less variable, and can hedge against long-term volatility and climate change effects. Wind integration can be maximized in all jurisdictions through the geographic distribution of wind farms, wind energy forecasting and additions of small amounts of reserve capacity.

Alberta, however, is now losing ground as Canada's leader in wind energy development, with both Ontario and Quebec expected to move ahead in the next few years. Alberta projects are running up against a need for increased transmission infrastructure investment in order to proceed with new projects. Planned projects combined with projects waiting for transmission in the province represent $2.3 billion of investment potential and, as the wait continues, Alberta companies such as Canadian Hydro Developers, Enbridge Energy, EPCOR and Suncor are beginning to make larger investments outside Alberta than within their own province.

Wind energy represents a tremendous economic and environmental opportunity for western Canada, but we are just starting to scratch the surface of its potential and the West remains far behind the global leaders in this area. Germany already has almost 20,000 MW of installed wind energy capacity. Denmark gets 20% of its electricity from wind, and Spain and Germany get 7-8% of their electricity from wind, with plans for much more.

If western Canada hopes to continue its role as a global and continental energy-producing superpower, it will need to accelerate its efforts to develop the sustainable energy sources of the 21st Century – including wind energy. We all will benefit.

Full "Steam" Ahead in Saskatchewan's Oilpatch

by Brenda Tacik

With western Canada's oilpatch operating at full throttle, it may be impossible to imagine all this activity gearing down anytime soon. However, forecasts for heavy oil recovery in Saskatchewan show a 50% decline over the next decade, says Kelvin Knorr, a senior research engineer with the Saskatchewan Research Council (SRC).

That is, of course, unless innovative and environmentally attuned enhanced oil recovery (EOR) technologies – now being optimized in the laboratory and in field trials – are widely applied to suitable reservoirs to keep up the pace of production.

Knorr is a project leader with a new field demonstration program dubbed JIVE (Joint Implementation of Vapour Extraction) and helmed by the Regina, Saskatchewan-based Petroleum Technology Research Centre (PTRC). The three-year, $9.6 million program aims to prove the viability of a family of EOR processes known as solvent vapour extraction (SVX) in three very different western Canadian heavy oil reservoirs.

Saskatchewan's Heavy Oil

Around 30 billion barrels of conventional heavy oil, roughly one-tenth the size of the Athabasca oil sands, lie in the Western Canadian Sedimentary Basin. Most of this resource is in the Lloydminster and Kindersley regions of west-central Saskatchewan and contributes to the province's status as Canada's second largest oil producer, at 18% of total output. Current technology is unable to tap around 26 billion barrels of this heavy oil.

Experience shows that advances in enabling technology are the key to the heavy oil resource, which is difficult to unlock through ordinary drilling or waterflooding methods. Heavy oil recovery in Saskatchewan so far has averaged less than 10% of the original oil in place; by the late 1980s, production had all but died out. But the advent and quick industry uptake of horizontal well drilling and cold production methods reversed the sector's fortunes.

Now that these applications have reached maturity, and production is in fact declining modestly, SVX is showing great promise as a similar technology step change, says Brian Kristoff, the PTRC's acting Executive Director. SVX involves injecting a gaseous hydrocarbon solvent, generally propane or butane, into a reservoir through either horizontal or vertical wells. The solvent dissolves in the oil, thinning it enough so that it can flow to a production well.

Advantages of SVX

SVX offers considerable advantages over thermal recovery methods such as steam-assisted gravity drainage (SAGD). Currently the preferred method of heavy oil recovery, SAGD is also being deployed extensively in deeper, thick oil sand pay zones that cannot be mined. However, thermal methods don't lend themselves to the thin pay zones in which much of Canada's heavy oil and oil sands are found, since surrounding rock and water scavenge the heat.

Not only does SVX have the potential to recover between 5 to 8 billion barrels of heavy oil in Saskatchewan alone (6 to 10 times the remaining reserves), it promises to tread much more lightly on the environment than SAGD. Unlike SAGD, SVX requires neither water nor heating by natural gas, and only small amounts of energy for solvent compression and extraction. Most of the solvent can be extracted from the produced fluids and re-injected. The use of SXV rather than SAGD would result in a massive reduction in CO_2 emissions and fresh water use.

JIVE Attracts Eager Partners

At the heart of the JIVE Program are three field pilots – underway or planned – to evaluate the highly reservoir specific SVX technology.

The industry hosts, Nexen Inc., Husky Energy, and Canadian Natural Resources Limited, are sharing data with each other like never before in the normally tight-lipped oilpatch. Kristoff calls this cooperation "a unique breakthrough that will accelerate adoption of the technology." Already, other potential partners are clamouring for an international version focusing on different types of reservoirs around the world.

JIVE's research bodies include PTRC (the program manager), SRC, the University of Regina, and the Alberta Research Council. Governments – Sustainable Development Technology Canada and the Government of Saskatchewan – have committed millions in cash to help develop the technology's rich potential.

A key research tool is the high-pressure, three-dimensional scaled physical model built and commissioned by SRC for the PTRC with funds from the Western Economic Partnership Agreement. This model, used to mimic actual reservoir conditions and predict and optimize process performance, is the largest and most capable of its kind in the world. As well, SRC's mobile laboratory provides immediate, on-site analysis of the pilots as they progress.

Over the next three years, JIVE will foster the new SVX technology in the same way that the world-renowned Weyburn-Midale CO_2 Monitoring and Storage Program has advanced carbon dioxide injection for light/medium oil EOR and simultaneous greenhouse gas storage.

IEA GHG Weyburn-Midale CO2 Monitoring and Storage Program

Started in 2000, this 8-year, $80 million field demonstration program piggybacks on two commercial EOR CO_2 floods in southeast Saskatchewan fields operated by EnCana Inc. (Weyburn) and Apache Canada Ltd. (Midale). The study – led by the PTRC and sponsored by the International Energy Agency– has excited interest worldwide; "Weyburn-Midale" has become synonymous with geological CO_2 storage.

Although flooding a partly depleted oil reservoir with carbon dioxide to coax out additional barrels is common in the United States, "Weyburn-Midale" is the first instance of a commercial flood using CO_2 from an industrial, rather than naturally occurring, source: the CO_2 is pipelined 320 km from the Dakota Gasification Plant in Beulah, North Dakota. These fields are a natural laboratory, and comprehensive logs stretching back many decades provide superior understanding of the changes that occur as the CO_2 floods progress.

As with JIVE, the dedication to innovation shown by industry partners is critical. But it's paying off for them. Since EnCana started the Weyburn CO_2 flood in 2001, it has increased oil production by 60% and expects to recover an incremental 155 million barrels of light/medium oil over the next 25 years. Meanwhile, it will have stored 30 million tonnes of CO_2, equivalent to removing 6.8 million cars from the road for a year.

In the final phase of "Weyburn–Midale," the PTRC and its partners are developing a Best Practices Manual for geological storage of greenhouse gases, so that the technology can be applied globally in different types of reservoirs, including saline aquifers. Over the next few years, EOR should become the rule in Saskatchewan's oilpatch, as innovative practices are increasingly introduced and familiar ones are given a fresh spin.

Technology is being optimized through the PTRC's industry-supported Core Research Program, for example, to boost the success of waterfloods in heavy oil reservoirs – an application virtually unique to western Canada – as well as for lighter oils. Flue gases from industrial plants are being tested as a cheaper, more available, and potentially more effective recovery agent than pure CO_2. The intriguing possibility of using wormholes, channels carved out in reservoirs by primary drilling, as natural horizontal wells is being realized through development of practical reservoir engineering tools.

The outlook for EOR applications in Saskatchewan is full steam (or solvent or water…) ahead.

Brenda Tacik is a technical communications specialist with the Energy Division of the Saskatchewan Research Council (www.src.sk.ca).

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Hydrogen and Fuel Cells: Powering Canadian Leadership and Innovation

by John W. Tak

Our perceptions about energy – where it comes from, and how we use it – are evolving:

- The rapid economic growth of developing countries such as China and India is placing unprecedented strains on global energy supplies and power generation capacity. Global energy demand is 50% higher than it was only 20 years ago and will likely increase by over 50% between now and 2030.(1)

- We are also growing increasingly aware of the very real consequences associated with the accessibility of oil supplies. Nations across the globe continue to consider and struggle with geo-political tensions inherent to importing oil.

- Air pollution continues to be a concern in many urban centers of the industrialized world and in developing countries. Emissions from industry and motor vehicles release smog, ozone, particles, and nitrogen and sulfur oxides into our environment, all of which can severely affect our health. Health Canada estimates that every year several thousand Canadians die prematurely due to air pollution.(2) According to the Ontario Medical Association, tens of thousands of people visit emergency rooms or are hospitalized each year in Ontario as a result of exposure to smog.(3)

- As Canada continues to debate its position on the Kyoto Protocol, there is growing awareness of the implications of climate change caused by the emission of greenhouse gases, much of which is generated by burning fossil fuels (coal, oil and natural gas). Many consider climate change to be one of the biggest challenges facing humanity over the next century.

Globally, these stark realities are driving the development of new technologies and ideas. The challenges of energy supply and security, clean air and climate change recognize no boundaries, but the products of human ingenuity can have far-reaching results as well.

In Canada, a unique, home-grown technology is putting the country in a position to improve the quality of life for Canadians and people across the globe. Hydrogen and fuel cell technologies and products are made-in-Canada solutions that will improve the air we breathe, ensure secure and reliable energy, reduce the emissions that cause climate change, and create highly skilled jobs. The potential applications for hydrogen and fuel cell are countless – from running our vehicles, to powering our cellular phones and laptops, to heating our hospitals and homes.

For Canada, the chance to take advantage of its hydrogen and fuel cell capabilities is significant. With its nucleus of leading hydrogen and fuel cell companies and research institutions, Canada enjoys substantial world-renowned expertise in this field.

As a pioneer of hydrogen and fuel cell technologies and products, the Canadian industry has enjoyed rapid growth in the last 10 years. Consider that in 1996, less than 20 companies had hydrogen and fuel cell activities. Today, the Canadian hydrogen and fuel cell industry features over 100 organizations and is growing. Canadian capabilities include fuel cell technologies, components, systems supply and integration, fueling systems, fuel storage, and engineering and financial services. Canada's hydrogen and fuel cell expertise extends across the country, in centres such as Calgary, Toronto, Kingston, Montreal and Vancouver.

This leadership is being achieved, in part, through a high-level of collaboration between government and industry. This longstanding partnership combines the technological breakthroughs achieved by Canadian companies and research institutions with the support of government policies and programs.

The benefits of deepening these partnerships between governments and the private sector are unmistakable. The Government of Canada and the provinces are providing valuable programs, policies, and research and development to support the growth of the sector.

The return on public investment to date is clear. Canada's hydrogen and fuel cell industry generates numerous economic benefits for Canada. Along with providing 2,000 highly-skilled jobs to Canadians, the private sector continues to be committed to innovation by investing $200 million per year in research and development.(4) It is clear that the private-sector is leading this development. Over the past five years alone, the industry has invested over $1 billion in R&D, while the government in that time has provided just over $100 million.

Worldwide, hydrogen and fuel cells are reaching a critical threshold of moving from research, development and demonstration to sales in various markets. The use of hydrogen and fuel cells as cost-competitive power solutions in forklift, back-up power, residential co-generation and micro-power applications are key markets for early commercial sales. Customers today are validating Canadian hydrogen and fuel cell products in these early markets.

These are no longer one or two-unit demonstrations – these products are available today, meeting the needs of end-users and customers across a variety of applications. They are commercial orders in early-adopter, industrial markets. And the Canadian companies selling them exemplify a new focus that respects the need to continue research and development but also emphasize the requirement of working with an end-user with an identified need, clear specifications and metrics for success.

At the same time, the Canadian industry is making impressive technical progress. Companies and research institutions are experiencing breakthroughs in fuel cell performance and operational lifetimes, improved stack density and durability, and continued cost reduction.

Commercial orders in early-adopter markets will continue to refine basic hydrogen and fuel cell technology, develop infrastructure and provide manufacturing volumes. Together with the industry's technical progress, Canada will have a solid foundation as other markets emerge, such as those in the transportation sector.

The benefits of hydrogen and fuel cells are not lost on Canada's competitors. Other jurisdictions are making significant investments in response to the significant market potential of hydrogen and fuel cells. The recent US Energy Bill provides $4 billion for hydrogen and fuel cell activity over the next five years. Europe, Japan, China, Korea, India and others have major supporting initiatives for the sector. If Canadian governments fail to respond in kind, then Canada risks losing its lead in hydrogen and fuel cell development.

Canada has an opportunity to be at the forefront of an energy revolution. In the 19th Century, the Industrial Revolution was fueled by wood and coal. Oil and gas powered an unparallel age of economic and technological growth in the 20th Century. In the 21st Century, oil and gas will continue to play a large role. Hydrogen and fuel cells will provide solutions for Canada to improve air quality, mitigate the effects of climate change, provide secure and reliable energy, and grow its economy.

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John W. Tak is the President & CEO of Hydrogen & Fuel Cells Canada. The group is headquartered in Vancouver, British Columbia at the National Research Council's Institute for Fuel Cell Innovation and is recognized internationally as the voice of Canada's hydrogen and fuel cell industry.

A Landowner's Coal Bed Methane: Perspective

by Norma LaFonte

Coal Bed Methane, commonly called CBM, is not new, but was not considered cost effective to develop within Canada until the past few years.

Although the extraction of CBM has been prevalent in the US for a number of years, their experience from a landowner or environmental point of view has not been positive. Internet searches on areas such as Colorado and Wyoming turn up a long list of sites detailing the challenges faced. Each state in the US has different rules and regulations, some more stringent than others.

Most of the problems have been attributed to "wet" coals, which require de-watering. Other issues include deteriorating water well quality, gas migrating into water wells, segmentation of land, compressor noise, dust, traffic and lack of respect for the environment.

Similar concerns were expressed in Alberta, the first province to have CBM development on a large scale. Landowners, politicians, regulators and concerned citizens have all been told by industry that the experience in Alberta will be different. We have a strong regulatory body, we have different geology, and we should not compare ourselves to the US.

After more than five years of relatively benign development, at least compared to what is expected (a National Energy Board report released in August 2004 states that they expect "50,000 CBM wells to be drilled in the next 5 years – all in the Horse Shoe Canyon coals"), Alberta has learned that we are indeed different from the US. Unfortunately, "different" does not mean better. We do have a strong regulatory process (The Alberta Energy and Utilities Board), and we do have areas of different geology – but many of our experiences are similar.

The majority of Alberta experience to date has taken place in coal beds that are considered dry – meaning very little, if any, water is produced. The gas has been sweet and clean and can often be sent directly from the well into a sales line with very little processing involved.

Unfortunately, extraction of the resource has required multiple wells, miles and miles of pipelines and access roads. Many of the wells produce at such a slow rate that the gas requires compression, which means ugly and sometimes noisy, compressor stations.

Releasing the methane from the coals has been tricky. As a result, it is common practice to "perforate" and "fracture" the wells, often multiple times. In lay terms, this means blasting holes in the casing of the well and then forcing a chemical compound, and/or pure nitrogen into the well casing which creates fractures in the underground coals and surrounding geology. Many believe that this is one of the processes which has led to the problems currently associated with gas migration and damage to the aquifers. Many of the wells fractured are quite shallow and near the base of ground water protection.

No tangible proof yet exists to confirm that energy is responsible for problems with the water well changes experienced – changes that include high levels of methane gas, high counts of micro-organisms, slime, dark and dirty looking water and chemical composition changes. However, many landowners are reporting negative changes to their water wells. Anecdotal evidence is not proof, but when negative impacts are consistently reported across a wide range of CBM development, a pattern is formed. The pattern of water wells changing chemical or gas composition is neither positive nor welcomed in rural Alberta.

CBM requires many more wells in a quarter section than traditional gas. This has affected the ability to use the land productively from a farming point of view. Permanent restrictions on the Right of Way and the Surface Leases stay with the land, even once the well is finished producing. Pipelines run like spider webs restricting development potential. Well sites and their access roads impact how farmers farm, and encourage trespassers. Compressors considered to be too big, too ugly and too noisy are negatively impacting quality of life, and potentially tourism. Long-term planning for the future will be difficult and some feel that the value of their land is diminished. Beautiful, natural Alberta may soon become "Industrial Alberta—home of oil and gas."

Few landowners are truly opposed to CBM, but many are leery. Communities and landowners need to be treated as partners in the process. They deserve to be treated with respect and honesty, and the concerns they raise need to have solutions that include industry and government working to the highest standards possible for the protection of the land and water. Most importantly, our politicians need to ensure that they are not be unduly influenced by the dollars that oil and gas puts into the provincial coffers.

Many citizens believe in the Mark Twain principal of "whisky's worth drinking, but water is worth fighting for." We all need to be mindful that although we believe we need CBM, we cannot survive without water and that we all have a responsibility to look after our environment.

Norma LaFonte of LaFonte Consulting Service is a land advocate/land agent near Strathmore. Alberta

Market Forces Bring Sanity to Oilsands

by Todd Hirsch

The economic forces of supply and demand are extremely powerful tools for understanding how markets establish an equilibrium price. They are also really good at knocking some sense back into market players when things get out of whack.

Take, for example, Alberta's oilsands. They have received a lot of attention over the past few years, and no discussion of the province's economy is complete without reference to the billions of barrels of established reserves and the billions of dollars of projects to extract them either underway or on the drawing board.

It is almost impossible to estimate the total value of these projects because it is a moving target. A few years ago, the estimate was $30 billion. Then $50 billion. Then $80 billion. Now recent figures suggest somewhere around $125 billion. The tally keeps rising with each new mega-project announced, and with the soaring construction costs of individual projects themselves.

Fueling the general stampede of players into the oilsands is the record-breaking price of crude oil back in the summer (although adjusted for inflation, prices in the early 1980s were higher still). Analysts seem to agree that we have entered a new era of higher world energy prices. This makes new oilsands projects an appealing business venture.

But lately, some cracks have started to show in the oilsands investment parade.

Consider some of the news headlines that have cropped up this fall. Some projects are being scaled back, mostly because of estimated cost over-runs and labour shortages. Awareness at home and abroad of the environmental sensitivity in the region is rising daily and the housing and infrastructure challenges faced by Fort McMurray are becoming the stuff of legend. Aboriginal groups are starting to ring the alarm bells a little louder because of falling river and lake levels in the region and crude prices have slid 20%.

A recent headline on the front page of the *Calgary Herald* in September read: "Falling oil price imperils projects."

Is this the beginning of the end for the oilsands? Hardly.

The reality is that a small economy like Alberta's cannot handle $125 billion in oilsands projects without something buckling or collapsing. It is like the campfire game where you keep sticking marshmallows in your mouth while trying to say "fuzzy bunny." Eventually, you can't fit anymore more in.

A lot of people are quick to blame market forces for the problems. But for all the condemnation "the market" has received, it is also "the market" that is working to correct the situation. In this case, the local and global market for construction materials is acting as a natural breaking mechanisms on the oilsands projects. Wages for construction work are soaring, and in some cases it is not even possible to get work crews. Prices for steel, pipe, concrete and other building material are high and rising. The supply and demand fundamentals in these markets are forcing oilsands companies to redo the math and question if now is the right time to get in on the action or not.

Alberta's oilsands parade is certainly not ending. But it may be that a few raindrops are starting to fall. Not all of the projects on the drawing board will proceed. Some of the ones that do proceed will be scaled back or delayed. The sector will eventually find a more reasoned pace of expansion, a pace that is more in line with the best interests of Albertans. In this case, we have the market to thank, not to blame. It's doing its job.

Where we have fallen short is on the policy front. Determining the optimal pace of oilsands development from the perspective of the public interest is a tricky question, but it is one that Albertans and their elected leaders must tackle head-on. This does not mean that the provincial government should interfere unduly in the market, but it does mean that a clear policy rooted in a long-term plan is needed so that businesses, the Alberta Energy and Utilities Board and Albertans know which direction to go in and why.

The oilsands are simply too valuable to the energy future of the province and Canada to shirk this duty. As noted above, the market will adjust, now it's up to the policy-makers.

Todd Hirsch is the Chief Economist with the Canada West Foundation.

Image courtesy of Suncor Energy Inc.

Emotional Energy:
Understanding Western Canada's Energy Future

Dr. Roger Gibbins
President and CEO
Canada West Foundation

Energy is a subject that always stirs up a lot of emotional and passionate debate.

Perhaps this is because energy – like food and water – is a necessity for life. Energy is synonymous with "shelter" as being one of the core requirements for sustaining life. We need energy to heat our homes and our schools, our places of work and our health care facilities. Without some form of energy to provide heat in the winter, life in western Canada would be impossible.

For this reason alone, it makes sense that energy resources stir up emotion. Without them, we'd die!

But the emotion around energy goes beyond the fact that it is a necessity to sustain life. Energy has also become a key ingredient to powering our economy. We drive cars, run factories, fly planes, power computers, and ship commodities – and all of this requires energy. We have become quite accustomed to using energy not only to keep warm and stay alive, but also to make money. Energy is an important lubricant that keeps our engines of commerce and wealth creation running.

Aside from sustaining life and powering our economy, energy is also required for all of those other discretionary pleasures in life – those that would be sorely missed if taken away, but would not end in anyone's death or the collapse of an economy. We use energy to watch TV, read books, travel on vacations, and enjoy our iPods.

In western Canada, discussion of energy is perhaps even more emotional and passionate than elsewhere because of our political history. Energy has in many senses defined who we are. The term "The National Energy Program" still stings the ears of many Albertans. Other western provinces have had their own passionate debates around the development of hydro and other energy resources. Plans for a uranium refinery in Saskatchewan in the 1970s were defeated by an extremely emotional grassroots effort.

It would be wrong to say that energy gave birth to the West. Aboriginal peoples inhabited the West long before any oil well was drilled. Even the first European pioneers and the Canadian Pacific Railway opened the West to settlement decades before the first natural gas pipeline, hydro dam, or oil sands upgrader was built in the West.

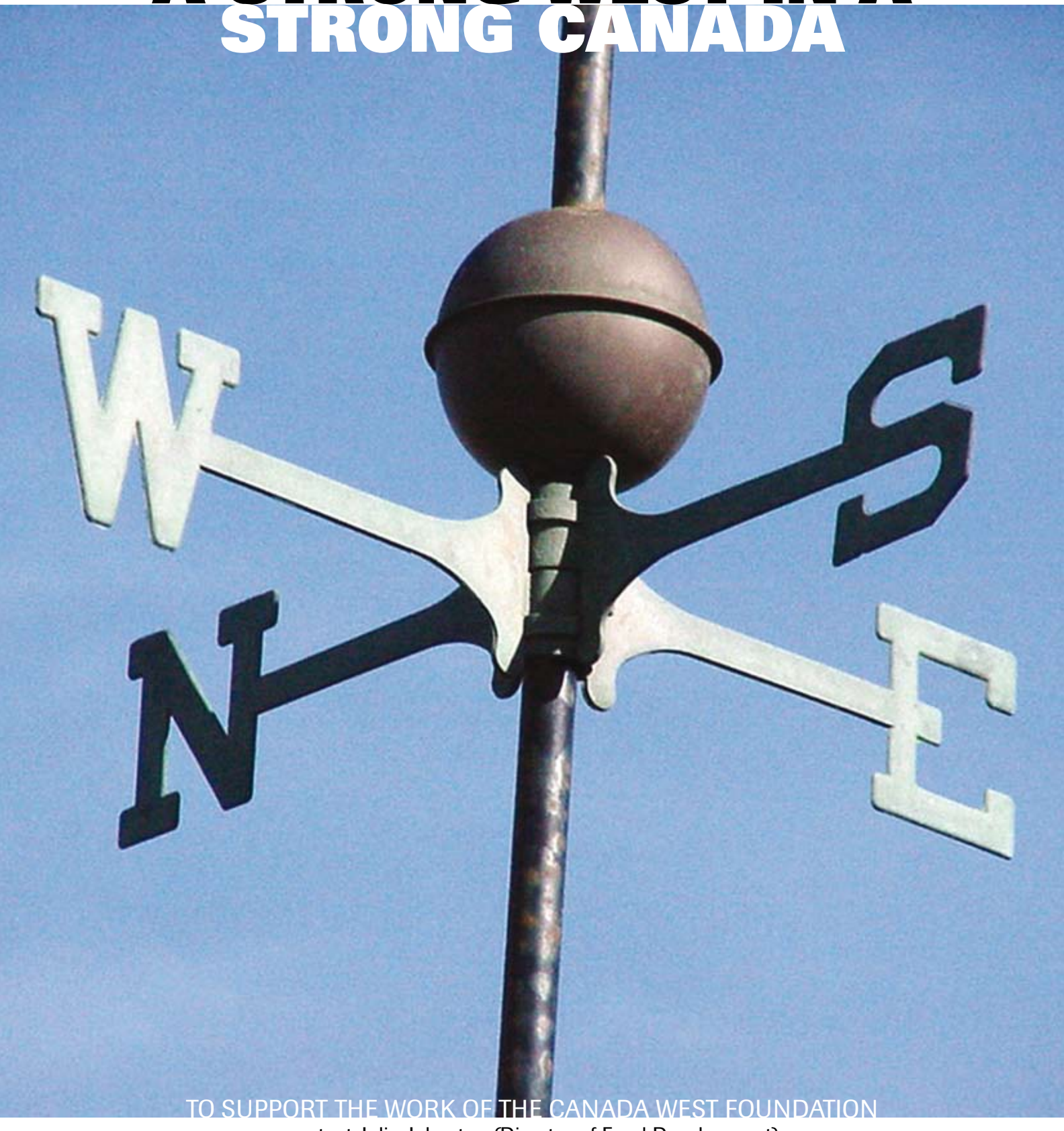
But it would be correct to say that energy *grew* the West into the modern, wealthy, and prosperous region it is today. Even those industries not directly related to energy extraction – agriculture, for example, or forestry – owe a considerable amount of their growth and development to the West's abundant energy resources.

Some energy projects like Alberta's oil sands have received a very large amount of coverage; other projects, however, have grown quietly in the shadows. It is hoped that this edition of Dialogues magazine will cast light on many of the West's energy developments, especially those for which the story has not been widely told.

Energy will always stir up emotion and passion among westerners, and well it should. But along with the emotion and passion needs to come understanding, reason, and an attitude of environmental stewardship.

For these reasons, it is important for westerners to be in constant dialogue about energy issues. How we use our energy resources will continue to be a major issue in the West for decades to come. The more we can learn about these energy issues, the better we can manage them in the future.

A STRONG WEST IN A STRONG CANADA



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