



Woodrow Wilson
International Center
for Scholars
Canada Institute



Canadian Centre
for Energy Information



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Advancing the Energy Dialogue

The Canada Institute of the Woodrow Wilson International Center for Scholars and the Canadian Centre for Energy Information co-hosted the sixth Cross-Border Forum on Energy Issues in conjunction with Global Public Affairs, The Energy Council, and the Embassy of Canada on October 12 and 13, 2006. The forum, held at the Wilson Center in Washington, D.C., looked at “Security and Assurance of the North American Energy System.”

The sixth iteration of the successful cross-border forum series built on earlier opportunities for important sector-specific dialogue and has become an important, honest, and open gathering of the energy sectors in both the United States and Canada. What began as a dialogue on a range of business issues between senior industry, academic, and government representatives on both sides of the border has evolved into a regular, structured exchange of views on the challenges confronting the energy sector in North America.

To ensure substantive discussion and interaction, the format for the forums revolves around a closed-door discussion among participants initiated by presentations from guest panelists. Participation is limited to a select group of industry and government representatives whose knowledge of the issues and interest in cross-border energy trade ensure a candid exchange of opinions and thorough discussion of key—and sometimes difficult—questions. As such, the forums are intended to foster and sustain an ongoing dialogue between stakeholders in each country’s energy sector.

The Canada Institute has worked with the Canadian Centre for Energy Information, Global Public Affairs in Calgary, and the Embassy of Canada to organize these forums.

The fourth forum, “Discovering the Possibilities of North American Petroleum Production,” took place on October 17, 2005 and considered policy, regulatory, and market access challenges for non-

traditional sources of energy in North America, with a specific focus on the development of Canada’s oil sands. Participants agreed on several key issues including “taking the long view” when approaching the development of oil sands, and a market-based approach to energy policy. Attendees also addressed the challenges of developing the oil sands including lowering costs and building sufficient infrastructure such as pipelines and refineries. Notably, the consensus of the event was that the largest challenge facing the industry is timing; it seems that “it’s crunch time.”

The fifth forum was held March 2, 2006; the program, “Investing in the North American Electricity System,” considered challenges for expanding electricity generation, transmission, and distribution in North America. The challenges of harnessing capital in order to revamp a seriously under-funded electricity system are immense. Risks and uncertainty in the regulatory environment, the political sphere, and the market structure are difficult hurdles to overcome. The subsequent closed-door discussion yielded a sense of “cautious optimism” about the prospects for progress in modernizing and expanding the electrical grid. But what was absolutely clear was the need for continued cross-border cooperation and joint management of the electricity system.

The sixth forum was held in Washington and analyzed efforts to assure the capacity to withstand disruptions to the cross-border energy system. The two-day program—a first in the Cross-Border Forums on Energy Issues series—looked at “Security and Assurance of the North American Energy System.” As the two countries’ energy sectors become more integrated, our need to be mutually prepared for Hurricane Katrina-like natural disasters or terrorist attacks becomes vital.

The next round of energy forums begins on March 8, 2007 with a focus on “Energy Innovation, Science and Technology: Pathway to Progress in a North American Market.”





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Discovering the Possibilities for North American Petroleum Production

MONDAY, OCTOBER 17, 2005
8:15 A.M.–1:30 P.M.

OPENING REMARKS

Lee H. Hamilton, President and Director,
Woodrow Wilson Center

Andrew Stephens, Vice President, Corporate
Planning & Communications, Petro-Canada
Greg Stringham (moderator), Vice President,
Canadian Association of Petroleum Producers

PANEL DISCUSSION

The Hon. Greg Melchin, Minister of Energy,
Government of Alberta

David W. Conover, Principal Deputy Assistant
Secretary for Policy and International Affairs,
U.S. Department of Energy

Aidan Mills, Vice President, Strategy and
Business Development, BP Americas Oil
Supply and Trading

Mike Ashar, Executive Vice President, Refining
and Marketing, Suncor Energy

Lloyd Byrne, Managing Director, Global Head
of Energy & Utilities, Equity Research,
Morgan Stanley

LUNCH PROGRAM

The Hon. Frank McKenna, Canadian
Ambassador to the United States

Robert Ebel, Chairman, Energy Program,
Center for Strategic and International Studies

KEYNOTE ADDRESS

The Hon. Orrin G. Hatch, U.S. Senator
(R-Utah)

The **Canada Institute** of the Woodrow Wilson International Center for Scholars and the **Canadian Centre for Energy Information** co-hosted the fourth *Cross-Border Forum on Energy Issues* in conjunction with the Canadian Embassy and the Alberta Office in Washington, D.C., on October 17, 2005. The program, “Discovering the Possibilities for North American Petroleum Production,” considered policy, regulatory, and market access challenges for non-traditional sources of energy in North America, with a specific focus on Canada’s oil sands. The program benefited from the support of **Suncor Energy**, **Petro-Canada**, and **BP Energy Company**.

The half-day program began at the Woodrow Wilson Center with a panel of presentations on oil sands and the potential for petroleum pro-

duction in North America by U.S. and Canadian government officials, industry representatives, and financial market analysts.¹ The panel was followed by a closed-door, frank roundtable discussion. The forum continued at the Canadian Embassy with a luncheon. The luncheon program included a wrap-up of the morning session, remarks by Ambassador Frank McKenna, Robert Ebel, chairman of the CSIS energy program, and a keynote address by Senator Orrin Hatch (R-Utah).

The forum provided an opportunity for more than 50 high-level Canadian and U.S. government officials, industry representatives, and energy experts to continue an ongoing dialogue on cross-border cooperation with a specific focus on the role of Canada’s oil sands in North American petroleum production. The discussion

centered on the significance of Canada's oil sands in the context of the global oil market and their growing importance for the North America. A number of panelists focused on the crucial importance of having the adequate regulatory, fiscal, and political environment for successfully exploiting unconventional oil resources. Forum participants discussed specific challenges and opportunities for oil sands developers in supplying the U.S. market and reflected on the resulting policy implications.

Canada ranks second only to Saudi Arabia in proven oil reserves. Canada "will inevitably displace Saudi Arabia as the world's oil giant."

1. Oil Sands and the Potential for North American Petroleum Production

Greg Stringham began the program by providing an overview of Canada's oil sands industry. Canada's oil sands industry took off in the 1990s and today Canada ranks second only to Saudi Arabia in proven oil reserves. At the luncheon, Senator Hatch predicted that Canada "will inevitably displace Saudi Arabia as the world's oil giant." Greg Melchin argued likewise, noting that 73% of identified oil resources have not yet been recovered. Melchin was quick to point out that in addition to its oil sands, Alberta is also well endowed with natural gas resources and is working to develop non-conventional sources such as coalbed methane.

This means that the United States will have access to a "secure, friendly source of [energy] supply." Today Canada is already the number one supplier of oil and natural gas to the U.S. market, ahead of Saudi Arabia, Venezuela, and others. David Conover underscored the importance of Canada-U.S. relations and friendship, as did Ambassador McKenna in his remarks at the closing luncheon. Canada is "the most secure and dependable source of energy" for the U.S. market, supplying the United States not just with oil, but also with natural gas, electricity, and uranium. Canadian exports of conventional oil comes

from all over the country; production from the oil sands, now at one million barrels a day (MMbbl/d), represents a growing share of the total oil exports to the United States. Melchin said that the current production level of one MMbbl/d from Alberta's oil sands is expected to rise between two to three MMbbl/d by 2010 and five MMbbl/d by 2030. Hatch noted that Utah already receives one fourth of its total oil consumption from Alberta's oil sands.

Mike Ashar of Suncor reflected on the opportunities and challenges faced by oil sands developers as this industry niche becomes an ever bigger supplier to the U.S. market. Shell, ExxonMobil, Petro-Canada, and many other companies provide an economically attractive and secure means to help meet the United States' long term energy needs. He acknowledged the many differences between oil sands and conventional crude oil resources, starting with higher costs for oil sands. That said, the oil sands industry has a number of competitive advantages that help level the playing field.

First, very little exploration is required to establish the location, size, and quality of reserves. At minimal cost, the location and size of oil sands deposits can be determined with a high degree of accuracy. Second, overall recovery rates are much higher than for conventional crude. Together these two characteristics offer a predictable and stable reserve base and long-term "recovery" prospects. Third, as Melchin explained, the Alberta and Canadian federal governments have introduced royalty and fiscal regimes that recog-



Aidan Mills
Greg Melchin
David Conover

nize the large scale, up-front capital investments required for oil sands development, while also accounting for the long-term nature of project payouts. Policy and regulatory initiatives are designed for both the project developers and the economy as a whole. U.S. officials enquired about the importance of Alberta's royalty regime in spurring the development of the oil sands industry. Oil sands developers agreed with Melchin's argument that the province's forward-looking royalty regime was critical for a nascent industry. Ashar stated that "had the regime been different, we may not have invested in Alberta." Fourth, Canada's oil sands developers have direct and secure access to the U.S. market.

Major oil companies are valued based on their growth rates as well as the returns on their investments.

Morgan Stanley's Lloyd Byrne underscored the importance of looking 15 to 20 years down the road when assessing investment options in the energy industry. Alberta's oil sands offer an attractive return on investment and have more than 50 years of reserve life. The oil sands industry also operates in a stable political and financial environment and will benefit from further technological breakthroughs. Yet operating costs associated with the extraction and processing of oil sands are a major concern, including labor costs and gas costs. Byrne concluded with a cautionary note on the valuation of oil sands investments: "oil sands have to get valued properly or they are going to go away."

The widely held consensus is that Alberta's oil sands hold an estimated 170 billion barrels of reserves. A number of participants expressed concern over differing standards for calculating oil sands reserves. On the one hand, some argue that "if the resources are there, they should be accounted for"; but from an investor's perspective, the critical issue is the cost of recovering the resources and bringing them to market. The debate on standards recently has fuelled conflicting estimates of Canada's oil sands reserves among the oil majors following the change in the filing

rules for a company's proven oil resources on December 31, 2004. As a result, companies have booked their oil sands reserves according to different criteria, depending on how they classified them. One possible solution to remedy such discrepancies would be to establish internationally accepted standards for assessing reserves. Aside from ongoing differences between private companies, Melchin remarked that the Alberta Energy Utilities Board has its own numbers and reserves prognostics verified by third parties, making Alberta a more transparent, attractive place to do business. In contrast, he noted that Saudi claims regarding increases of that country's reserves are typically met with a certain degree of skepticism, since nobody can independently verify official Saudi statements or the state-owned oil monopoly's accounting system for its reserves.

2. Canada's Oil Sands in the Context of the Global Oil Market

Andrew Stephens from Petro-Canada remarked that growing demand for energy in the United States has proved critical to Canada's success in developing its oil sands reserves and bringing them to market. As the same time that Alberta was tapping its oil sands, new sources of oil supply in the world market have become more scarce and difficult to exploit. Looking at the fundamentals of the global energy market, Lloyd Byrne explained that the current \$60/barrel price range for oil futures is no surprise: as conventional oil supplies dwindle, the expectations of growing demand rise, notably from the United States. Current oil prices in turn make costlier, unconventional sources more attractive. "Repeatable resources" in Canada and the United States, such as methane hydrates, have become more attractive despite high initial costs. Aidan Mills from BP agreed that there is indeed primary global demand for Canada's heavy crude derived from oil sands, especially given today's prevailing oil prices, which ensure that production from Canada's oil sands are competitive. Furthermore, since the quality of much of the world's oil supply is becoming ever more heavy and sour, Canada's oil sands are well placed to supply the market, especially in the United States, where two of every

three imported barrels is sour (only 30% of oil imports are sweet).

Government representatives at the forum were particularly interested in learning how the market hedges against government and pricing uncertainty. The past five to seven years have been a trying time for oil futures, with many predications going awry—futures used to be priced at \$30 a barrel, and are now trading at twice the price. Those who swapped forwards lost significant opportunities. However, as Byrne stressed during his presentation, the price of oil alone is not the only determining factor for the markets. Energy companies will consider a number of factors before investing. For oil sands developers, such considerations include the global trend toward heavier, sourer crude, the proximity and access to the U.S. market, and the growth in specific markets, such as California or the U.S. Gulf Coast region, where, according to Mills, deregulation and extra “cooking capacity” herald new opportunities for Canadian heavy crude.

Byrne explained that Wall Street is less concerned with the price of oil itself than with which companies can best reinvest their cash flows. Major oil companies are valued based on their growth rates as well as the returns on their investments. Most are also debt free and have stacks of cash that can be easily invested. These factors are critical in understanding the types of investments the oil majors make: when cheap gasoline was the norm in the mid-1990s, the oil majors neglected their assets in the refining sector, which then was only earning a lowly 2-3% return on investment. As a result, few, if any, invested in their refining capacity, and today “we’re paying for it.”

3. Positioning Canadian Heavy Crude in the U.S. Market

Western Canadian crude oil is currently connected to more than 70 refining operations in various centers across the continent. To consolidate their position as major suppliers to the U.S. market, oil sands developers will need to increase their reach.

According to Aidan Mills, the traditional market remains the U.S. Midwest, but there are promising signs that the U.S. Gulf Coast and California are set to become significant growth

areas for exports of Canadian heavy crude as new cooking and refining capacity comes online. Seizing these opportunities, however, requires overcoming a number of challenges, including access to market and the timing of new infrastructure connecting suppliers to refineries. The pipeline capacity from Alberta to eastbound markets is still insufficient, according to Mills, who underscored the importance of having a timely, market-based solution to infrastructure expansion. Mike Ashar further emphasized the need of cost effective and efficient pipeline services, specifically the need to consider well-targeted tariffs levied on pipeline use.

Several obstacles exist before Alberta could begin exporting oil to China.

This calls for extending the existing network connections further south or connecting oil sands production to tanker terminals on Canada’s west coast, providing access to California and Asian markets. The goal, based on economic fundamentals, is to connect to the refineries in southern parts of the United States. Projects by Enbridge, Terasen/Kinder Morgan, TransCanada, Koch, and ExxonMobil all aim to provide incremental capacity to move growing production.

Oil logistics only resolves part of the equation, as Ashar noted. Many U.S. refineries are not configured to accept oil sands crude. Perhaps as a result, Alberta’s longer term energy policy will be focused on moving toward value-added products, though Melchin dismissed talk of the provincial government’s potential interest in considering a refinery project. New refineries are not the only answer, however. Another option is to upgrade existing refineries so these can process crude coming from Alberta. Suncor, for example, is investing in upgrades to both its Sarnia and Denver refineries that will allow the company to take in more heavy and sour crude blends. EnCana and Premcor (now part of Valero) have proposed a joint venture at their Lima, Ohio refinery. Such refinery upgrades reflect a global trend in the market, which has seen an increasing

volume of heavy and sour crude being processed in the United States.

4. The Canada-U.S. Dimension: Energy Security and Policy Implications

Alberta's oil sands are increasingly being viewed as a "stable secure source of future oil for the world," and have attracted interest of others, including European, Japanese, and Chinese investors. The ensuing discussion broached the subject of Chinese interest in the oil sands, with participants asking about the prospects for Canada to expand its exports toward China and Asia. Panelists and industry representatives agreed that several obstacles exist before Alberta could begin exporting oil to China. Additional west-bound pipeline capacity would need to come online, and the question of timing is crucial: as long as Chinese refineries are not designed to process heavy Canadian crude, other exports markets with the required refining caliber and capacity will continue to take in Canadian oil, such as the traditional markets in the U.S. Midwest. Melchin stressed the importance of the U.S. market for Alberta's energy exports: current Chinese interest is an "anomaly"; it is the U.S.-Canada relationship that is "paramount" and "vital." He also underscored the importance of not harming energy relations with other issues such as the ongoing softwood lumber dispute.

The U.S. government is not striving for energy independence *per se*; rather U.S. policy is focused on energy security.

But U.S.-Canada energy cooperation goes beyond trade of oil and gas: when Hurricanes Katrina and Rita knocked out 30% of U.S. refining capacity and temporarily forced the closure of many Gulf Coast pipelines, Canadian pipeline operators were instrumental in helping to relieve supply shortages in the United States. One participant asked whether the U.S. government was retooling its energy policy toward a select few "preferred suppliers" around the world, and whether Canada was being acknowledged as one of them. David Conover of the U.S. Department

of Energy agreed that the strong Canada-U.S. relationship has ensured that U.S. energy imports from Canada fall within the overall strategy of diversifying U.S. sources of supply. Conover explained that the U.S. government is not striving for energy independence *per se*; rather U.S. policy is focused on energy security. Canada plays an important role in this regard. Asked how Alberta "stays front and center in the U.S. market," Melchin explained that the United States remains the primary focus of Alberta's energy industry, notwithstanding interest from other foreign buyers.

Conover noted that the recently launched Security and Prosperity Partnership (SPP) has trilateral working committees on energy, including an initiative on oil sands. There was some concern among forum participants, however, that the risk of "stovepipes" between the SPP working groups on the environment and the one on energy could prevent a productive discussion of environmental concerns resulting from oil sands development. On the other hand, the agenda of the North American Energy Working Group appears to be converging with the objectives outlined in the SPP, a promising development for cross-border cooperation.

5. Regulatory and Political Environment

Andrew Stephens stressed the importance of "taking the long view"; Alberta's success in developing the oil sands stems in large part to the long-term political vision of previous governments, who promoted a favorable investment climate by establishing a stable, predictable, and transparent operating environment. Melchin retraced Alberta's energy policies over the past three decades, explaining how long-term vision and forward-looking initiatives enabled the province to put in place a market-friendly, fiscally attractive, transparent regulatory regime. The "transparent, easy-to-navigate fiscal regime" and royalty system proved successful at attracting investors to Alberta, setting the foundations for sustained growth in the energy industry.

Senator Hatch commended the Canadian government's proactive stance on fostering the development of unconventional oil resources. Conover said that Canada's development of its oil sands has been "exemplary" and should serve as a model for

comparable resources in the United States. Hatch urged the United States to adopt a similar approach, noting that “those who would argue otherwise underestimate our capacity to exploit unconventional resources.” He argued that it was time for the U.S. government to take advantage of this attractive environment for developing unconventional oil resources and actively promote the development of oil sands and oil shale in western Colorado, Wyoming, and Utah. He dismissed a recent RAND report that suggested developing U.S. oil shale was not commercially viable.

There is no appetite in Canada for nationalization of energy.

Conover argued that the U.S. Energy Policy Act of 2005 goes a step in this direction, calling for the creation of a task force to identify opportunities for exploiting unconventional resources on U.S. soil such as oil shale, with help from Alberta. Yet during his remarks during the luncheon at the Canadian Embassy, Robert Ebel sounded a cautionary note regarding the Energy Policy Act, arguing that there is little political will in Washington to tackle the underlying energy challenges the United States faces. He intimated that energy bill was not bold enough, and the policy issues it did tackle came “four years too late.” That leadership and political will were absent is no surprising; the last time the political climate was favorable to significant advances in energy policy was in the aftermath of the oil shocks in the 1970s, when legislators enacted fuel efficiency standards. It may once again take a combination of high prices at the pump and gas lines to prompt politicians to seriously tackle energy reform in the United States. The aftermath of Hurricanes Katrina and Rita in September triggered fears of such a scenario, but it is unclear whether there is congressional appetite to revisit energy legislation comprehensively in the short term.

One participant voiced concern about the political climate in the aftermath of the hurricanes, asking whether price volatility could lead to political opportunism. Conover acknowledged the fears of price gouging at the pump, but noted that investigations are already underway. Congress too



U.S. Senator Orrin Hatch (R-Utah)

will look at the issue, though it is unlikely any specific legislation will come of it. As for Canada, Andrew Stephens remarked that Canada’s oil sands developers have also had to contend with general concerns in North America regarding security of supply and high prices at the pump. That said, retail price volatility may be cause for concern among consumers, but panelists agreed that “there is no appetite in Canada for nationalization of energy”; a recent poll in the *Globe and Mail* reflected this consensus view, too.

6. Challenges Facing Oil Sands Developers

Several panelists acknowledged the challenges facing oil sands developers: lowering costs (natural gas, a crucial input, is the single largest operating cost in oil sands production), broadening the pool of skilled labor, and building sufficient infrastructure from pipelines to refining capacity (including the question of whether refining takes place on-site or closer to consumer markets). The unique business of mining for oil is a relatively simple process, but the size, scale, and timelines to reap the benefits of development make it a very complicated business. The challenges oil sands developers face include:

1. controlling the operating cost of daily production as well as the capital costs and related labor demand to build and operate the facilities;
2. the environmental impacts of a growing industry;

3. pipeline capacity to get the oil sands heavy crude to markets; and, finally,
4. ensuring refiners are capable of turning oil sands heavy crude into the products the market demands.

Operating costs for oil sands are higher than those for conventional production—a median of about US\$20 per barrel for upgraded light crude.² Although considerably higher than average global lifting costs, there are no associated exploration costs, compared to a global average of about US\$11 per barrel.³ On a full cycle basis, that means that oil sands production is competitive with domestic conventional crude.

There is acute awareness among oil sands developers that managing the environmental impact of their operations is critical if they are to continue to retain permission to operate.

Operating Costs: Costs are constantly under pressure, in particular from the rising cost of natural gas used to process heavy crude. The industry is looking at new technologies to reduce energy consumption, such as injecting light hydrocarbons to dilute the bitumen in the ground to allow it to flow at lower temperatures. This would reduce natural gas requirements for steam. The industry is also looking at technologies that could replace natural gas altogether, such as the gasification, which holds the potential to turn petroleum coke into a stable energy supply. One participant asked about the potential of nuclear power to be harnessed as an alternative input to natural gas to generate steam for processing oil sands. The markets, however, have tended to dismiss this option as there are many uncertainties and timing constraints associated with bringing nuclear power plants online, dampening the prospects for attractive returns on investments.

Skilled Labor Shortages: The industry is looking at some US\$35 billion in new construction in the oil sands in the next five years. In a world of \$65/barrel oil and with companies and capital

providers scrambling to get a piece of the oil sands, this might not seem like a challenge. But developers are well aware that opportunities for increasing production levels are constrained by the scale of the projects, which can take five or more years from conception to completion. Skilled labor shortages and infrastructure bottlenecks have become significant constraints. According to Ashar, there is currently a need for up to 25,000 skilled laborers. There is a particularly acute shortage of welders, engineers, and specialized construction workers. The province of Alberta recently outlined goals to increase the number of permanent immigrants to at least 24,000 a year from about 16,000, with a focus on getting skilled trades to work—quickly.

The Hon. Larry Bagnell, Member of Parliament (Yukon), spoke of the challenge of integrating young aboriginals into the workforce. Despite low unemployment rates in Alberta and other resource-rich provinces, the largest group of young, unemployed Canadians is in aboriginal communities. There is a need for more government communication efforts and job training programs. Some companies have been proactive on this front. Ashar explained that Suncor's outreach programs in aboriginal communities over the past ten years have resulted in a significant increase of Canadian aboriginals in its workforce (in Fort McMurray, Suncor's workforce is now 11% aboriginal, up from 3% ten years ago).

During the discussion period, attention focused on how to address the demand for skilled labor. Melchin explained that the Alberta government is addressing question of immediate labor requirements from a multi-stakeholder perspective. He currently chairs an interdepartmental committee on human resources development, whose mandate is to work with industry to identify necessary skill set and the timing of mega-projects. One participant asked whether the industry was considering a North American labor strategy. Melchin acknowledged the need for proactive approach in conjunction with the United States to develop joint strategies. In this regard, he highlighted the initiatives outlined in the recently passed U.S. Energy Policy Act of 2005, which call for joint partnerships regarding

oil shale and oil sands in North America. Conover also noted that the SPP has trilateral working committees on energy, including an initiative on oil sands.

Infrastructure Constraints: Oil sands developers are working within their companies—and across the industry—to manage oil sands development. Project management is crucial to ensure that large-scale infrastructure developments do not compete needlessly for scarce labor; the timing of such undertakings is key. The emphasis is on staggering large-scale projects, breaking them down into phases to avoid overlapping demands on labor and resources. Cooperation between industry and government is underway to ensure appropriate infrastructure is available in the remote oil sands region. Oil sands developers are also cooperating to stagger demand for key project components by trying to balance maintenance and building schedules that draw heavily on key suppliers and a limited skilled workforce.

Environmental Challenges: Although the industry has made strides in managing the environmental impact of its operations on air, land, and water quality, the scale of growth remains a crucial challenge. The growth in production has driven an increase in total net air emissions, land disturbance, and water use—despite intensity improvements. This is a major issue for the industry, which is working to address its impact on the environment together with the Canadian Association for Petroleum Producers, the Cumulative Effects Management Association, and other multi-stakeholder groups. There is acute awareness among oil sands developers that managing the environmental impact of their operations is critical if they are to continue to retain permission to operate.

7. Outlook for Canadian Oil Exports

Technology and improved access to infrastructure, labor, and investment will continue to play a crucial role as the Canadian energy industry grapples with the challenges of the next decade—workforce shortages, infrastructure bottlenecks, and strongly held public perceptions of the industry with regard to energy pricing, corporate profits, and environmental impact. The most significant challenge,

however, is one of timing—the consensus in the industry is that “it’s becoming crunch time.”

Bagnell touched on a subject that has long presented challenges for the energy industry, namely the difficulty of bridging the gap between the industry and the public.⁴ Broad-based efforts between government and industry to disseminate energy-related information to the public must be promoted and sustained, he argued. Organizations such as the Canadian Centre for Energy Information play an important role in this regard. Bagnell underscored the importance of information dissemination on the part of the government, too, suggesting that some form of monitoring agency may prove beneficial. Industry representatives at the forum agreed that the private sector has to do a better job of communicating to the public just how efficient it has become.

Broad-based efforts between government and industry to disseminate energy-related information to the public must be promoted and sustained.

Alberta is well placed to meet many of these challenges by the very nature of the resource at stake: there is a need for the product and strong demand for oil sands production; there is no exploration risk; the industry has a competitive cost structure; there is limited political risk, long reserve life, and attractive returns. Moreover, in an environment of high oil prices, there is strong investor interest in Canada’s oil sands.

The key success factors in moving forward with oil sands development are also emerging clearly. There was consensus among participants that a market-based approach to energy policy is best. Alberta is competing for investment internationally and is well placed to attract capital and human resources. It is also crucial to continue building the U.S.-Canada relationship. Another priority is to encourage further collaboration between industry, academia, and government on regulatory frameworks, research and development, and project planning with respect to workforce and infrastructure. The provincial govern-

ment must not lose sight of the need to communicate with the public, continue stakeholder engagement, and educate people on oil sands and energy in general.

Finally, as Mike Ashar pointed out, “there is no quick fix... no silver bullet”; the industry needs to address these challenges collaboratively to improve the reliability of competitively priced, North American energy supply. It also behooves Albertans to realize that other sources of energy are necessary, including coal and nuclear power.

Notes

1. Speaker remarks, power point presentations, and related conference materials are available at the Canada Institute’s website, www.wilsoncenter.org/canada.
2. Canadian Association of Petroleum Producers, April 2005.
3. According to FirstEnergy, worldwide finding and development costs averaged US\$11 per barrel in 2004.
4. This has been a recurring theme through the *Woodrow Wilson Center Cross-Border Forums on Energy Issues*. See the proceedings from the first three forums on the Canada Institute’s website, <http://www.wilsoncenter.org/events/docs/energyforumproceedings.pdf>

Investing in the North American Electricity System

THURSDAY, MARCH 2, 2006
8:15 A.M.–2:00 P.M.

WILSON CENTER FORUM

David Biette, Director, Canada Institute, Woodrow Wilson International Center for Scholars

Colleen Killingsworth, President, Canadian Centre for Energy Information

Hans Konow, President and CEO, Canadian Electricity Association

Kevin Kolevar, Director, Office of Electricity Delivery and Energy Reliability, U.S. Department of Energy

Rick Jennings, Assistant Deputy Minister, Energy Supply and Conservation, Ontario Energy

Joseph L. Welch, President and CEO, International Transmission Company

Linda Chambers, Executive Vice President, Generation Technology & Supply Chain Management, TransAlta

John Thorndike, Vice Chairman, Investment Banking, Merrill Lynch

Richard Sergel, President and CEO, North American Electric Reliability Council

Barbara Kates-Garnick (MODERATOR), Vice President, Corporate Affairs, KeySpan Energy

KEYNOTE LUNCHEON

The Hon. Samuel W. Bodman, U.S. Secretary of Energy

Tom Parkinson, President and CEO, Hydro One

Jon Allen, Chargé d'affaires, Embassy of Canada

The **Canada Institute** of the Woodrow Wilson International Center for Scholars and the **Canadian Centre for Energy Information** co-hosted the fifth *Cross-Border Forum on Energy Issues* in conjunction with the Canadian Embassy in Washington, D.C., on March 2, 2006. The program, "Investing in the North American Electricity System," considered policy, regulatory, and technical challenges for expanding electricity generation, transmission, and distribution in North America. The forum was organized in partnership with the Canadian Electricity Association and Global Public Affairs, and benefited from the support of **Powerex Corp.**, **KeySpan Energy**, and **Hydro-Québec**.

The forum provided an opportunity for more than 50 high-level Canadian and U.S. government officials, industry representatives, and energy experts to continue an ongoing dialogue on

cross-border energy cooperation. The half-day event started out at the Wilson Center with a panel of presentations followed by a closed-door roundtable discussion. Representatives of government, industry, and investment banking discussed policy issues, reliability standards, investment trends, and challenges associated with building

Our shared electric system must be planned, built, and managed as if our border did not exist.

new generation and transmission capacity in the electricity sector. The forum continued with a luncheon program at the Canadian Embassy, where U.S. Secretary of Energy Samuel Bodman delivered the keynote address.



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The Need for Investment in the North American Electricity System

The Canadian and U.S. electric systems are integrated into a single, cross-border market, which remains one of the most reliable in the world. Secretary Bodman emphasized the importance of jointly managing our common electricity grid: “our shared electric system must be planned, built, and managed as if our border did not exist.” Yet as current and projected demand for electricity continues to grow, the expansion of the North American electricity system is stifled by bottlenecks of all sorts. The 2003 blackout, as Joe Welch pointed out, underscored both the degree of cross-border interdependence and the “fragility” of the electric grid. The greatest fear among players in the electricity market, according to Linda Chambers, is another event such as the 2003 blackout, which could prompt a “legislative overreaction.”

Having suffered from chronic underinvestment, North America’s electricity system is now at a crossroads: on the one hand, existing generation and transmission infrastructure requires significant maintenance and refurbishing; on the other hand, new capacity must be brought online before demand outstrips existing supply. As Hans Konow put it succinctly, “investment is necessary across the full spectrum.”

Bringing new sources of electricity online requires significant, long-term capital investment. Risks and uncertainty in the regulatory environment, the political sphere, and the market structure undermine such long-term, costly commitments. Moreover, consumer expectations are such that new sources of electricity supply must be reliable, affordable, and environmentally sustainable. The gap between consumer expectations and industry constraints suggests challenges of its own, of which policymakers, business leaders, and the public at large must be cognizant for investment in new and existing capacity to produce tangible improvements. “Education is key,” asserted Konow, as is the role of regulatory and government authorities, who have the power to shape the playing field. Chambers concurred, noting that “the public needs to understand the realities of the electricity market, including its cost structure”; otherwise “it is difficult to raise [electricity’s] profile and push policy forward.”

The Impact of the U.S. Energy Policy Act of 2005

In this regard, the Energy Policy Act of 2005 (EPACT) represents a new milestone and reference point. According to Kevin Kolevar, EPACT will help spur investment in a number of ways. There are incentives for new transmission. The

Participants in the Fifth Energy Forum on the Electricity System



law also repeals the Public Utility Holding Company Act (PUHCA), which will allow for more mergers and acquisitions and economies of scale. Kolevar argued that the congressional debate alone fostered investment in the electricity sector as the industry anticipated a clear set of rules of the road.

New sources of electricity supply must be reliable, affordable, and environmentally sustainable.

The law also requires the U.S. Department of Energy (DOE) to undertake a “congestion study” of the electricity grid by August 2006, whereupon DOE will designate special “electricity corridors.” Secretary Bodman noted that this study will draw on the extensive body of existing cross-border studies. A comment period, which ended on March 6, 2006, afforded companies and individuals an opportunity to provide feedback and make a case for “expedited corridor designation.” New projects proposed within these corridors can be approved by way of an expedited process, with the Federal Energy Regulatory Commission (FERC) empowered to grant eminent domain if state authorities with jurisdiction over the proposed project routes fail to complete the review process within a given timeframe. DOE officials expect that few cases will require the FERC to consider granting eminent domain—the existence of the eminent domain rule alone should spur state authorities to act on transmission project.

The conversation revealed a sense of “cautious optimism” about the prospects for progress in modernizing and expanding the electric grid.

The EPACT also directs the FERC to name an Electric Reliability Organization (ERO) to establish and enforce mandatory electric reliability standards. On February 2, the FERC issued a final rule directing potential applicants to file within 60 days. Richard Sergel discussed the North

American Electric Reliability Council’s plans to apply to be the ERO (with simultaneous applications to the relevant authorities in Canada). He stressed the need to vigorously enforce compliance in order to maximize the effectiveness of the present system, while providing strong incentives for investment to improve the reliability of the electric grid.

Similar Challenges across the Border

Rick Jennings highlighted the current challenges and opportunities facing Ontario’s electricity sector. As the province faces an electricity supply gap in the near future, developing new sources of supply (including controversial plans for a new plant in downtown Toronto), refurbishing existing generation capacity (including Ontario’s nuclear plants), and implementing energy conservation procurement are taking on renewed importance. Other challenges include moving away from coal-fired generation by embracing renewable energy as source of electricity production, including hydropower and wind power. As other states and provinces, Ontario must grapple with coordination among and between various regulatory bodies and deal with opposition from environmental and local interests (i.e., the NIMBY [“Not-In-My-Backyard”] syndrome).

Constraints Facing New Electricity Generation and Transmission Projects

Welch discussed the difficulties of building new transmission capacity. He highlighted a number of critical challenges, including the widespread use of the controversial “Location Marginal Pricing” mechanism, hidden constraints of financial transmission rights, frozen rates for end-users, overlapping and conflicting regulatory jurisdictions, and a host of disincentives to regional-based planning, coordination, and implementation of transmission projects. John Thorndike highlighted similar investment hurdles such as the “free rider” and “contingency” disincentives: investors are reluctant to expand transmission or build spare capacity when there is disproportionately little or no cost-sharing, even though the benefits are widespread. Welch also spoke at length of price distortions resulting from

**U.S. Secretary
of Energy
Samuel Bodman**



the existing market structure, which deter investment in transmission because “the money goes to generation.” He was skeptical that EPACT alone would be sufficient to address many of the underlying causes of underinvestment.

Chambers detailed the prospects for investment in new generation capacity. The EPACT’s repeal of the PUHCA is “a good start” as it will encourage investment in what is a long-cycle, capital-intensive business, which relies on capital markets for financing. Yet hurdles remain, including permitting and siting restrictions as well as obstacles to expanding the transmission grid. Moreover, technological breakthroughs are no panacea either, as most generation companies do not have the scale or research and development budgets required to bring technological innovations to market.

As a result, volatility and political risk remain, dampening the appetite for investment. Accordingly,

to reduce such volatility, electricity generation companies tend to spread risks across markets, fuel types, and partners. Financial institutions have also been active participants in the international commodities market, with some, such as Merrill Lynch, offering “one-stop shopping” for financing large-scale, capital intensive energy projects. By putting together financing proposals that cover the typical lifespan of a project, investors can sufficiently reduce the commodity risk with multi-year, fixed-price contracts, thus yielding attractive rates of return.

Investors are reluctant to expand transmission or build spare capacity when there is disproportionately little or no cost-sharing, even though the benefits are widespread.

The forum continued with a 90-minute closed-door discussion of the issues mentioned above. The conversation revealed a sense of “cautious optimism” about the prospects for progress in modernizing and expanding the electric grid, a point Tom Parkinson emphasized in his overview of the forum discussion at the luncheon program. Referring to the hurricanes and political uncertainty around the world, Secretary Bodman remarked that in times of stress and hardship “it is comforting to know that Canada and the United States can work together to ensure energy security.”

For more information, please visit www.wilsoncenter.org/canada or www.centerforenergy.com.

Security and Assurance of the North American Energy System

OCTOBER 12, 2006
1:30 P.M.–5:30 P.M.

ASSURING THE CAPACITY TO WITHSTAND DISRUPTIONS TO OUR ENERGY SYSTEM: THE OUTLOOK FOR PUBLIC-PRIVATE COORDINATION

David Biette, Director, Canada Institute, Woodrow Wilson Center
Colleen Killingsworth, President, Canadian Centre for Energy Information
Tom DiNanno, Deputy Assistant Secretary for Infrastructure Protection, United States Department of Homeland Security

Dr. James Young, Special Advisor to the Minister, Public Safety and Emergency Preparedness Canada
Michael Armstrong, Vice President, Emergency Management and Homeland Security, ICF International
Patrick Currier, Associate, Van Ness Feldman
Paul F. MacGregor, Vice-President, Operations and Engineering Services, TransCanada Energy

OCTOBER 13, 2006
8:30 A.M.–12:00 P.M.

SECURING ENERGY INFRASTRUCTURE IN NORTH AMERICA

Dr. James Young, Special Advisor to the Minister, Public Safety and Emergency Preparedness Canada
Representative John Smith, Louisiana House of Representatives and Past Chair, The Energy Council
Matt Morrison, Executive Director, Pacific Northwest Economic Region
Ed Tymofichuk, Division Manager, Transmission System Operations, Manitoba Hydro
David Nevius, Senior Vice President, North American Electric Reliability Council

Brian Gabel, Vice President, Corporate Services and Chief Financial Officer, British Columbia Transmission Corporation
Dr. David Dismukes, Louisiana State University Center for Energy Studies

KEYNOTE LUNCHEON

Paul Connors, Counsellor, Economic and Energy Policy, Embassy of Canada
Wyoming Senator Hank Coe, Chair, The Energy Council
Hon. Dave Mackenzie, Parliamentary Secretary to the Minister of Public Safety

The **Canada Institute** of the Woodrow Wilson International Center for Scholars, the **Canadian Centre for Energy Information**, and **The Energy Council** co-hosted the sixth *Cross-Border Forum on Energy Issues* in conjunction with Global Public Affairs and the Canadian Embassy on October 12 and 13, 2006 in Washington, D.C. The program, “Security and

Assurance of the North American Energy System,” looked at progress and challenges to the reliability and security of our North American energy infrastructure, how recent market and regulatory developments and initiatives have affected efforts to assure the capacity to withstand disruptions, and public-private coordination and cooperation in efforts to ensure that the shared infrastructure is



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International Center
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Canada Institute



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viable, resilient, and reliable. The forum also received support from **TransCanada** and **British Columbia Transmission Company**.

The forum provided an opportunity for more than 50 high-level Canadian and U.S. government officials, industry representatives, and energy experts to continue an ongoing dialogue on cross-border energy cooperation. The two-day event was held at the Wilson Center with two panels of presentations followed by a closed-door roundtable discussion. Each panel continued with a 90-minute closed-door discussion of the issues mentioned below. Representatives of government, industry, regulatory agencies, and the academic community discussed policy issues, the roles of the public and private sectors sharing of information and in assurance of infrastructure, areas for improvement, and the many approaches to ensuring the reliability of North American energy supply. The forum also included a reception at the Canadian Embassy on the evening of October 12, a networking breakfast for participants on October 13, and a luncheon program later that day sponsored by the Canadian Embassy, where The Hon. Dave MacKenzie, Parliamentary Secretary to the Minister of Public Safety, delivered the keynote address.

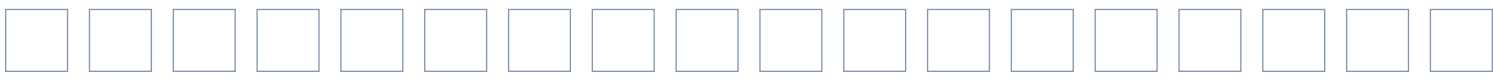
This conference was designed to explore the interface between the public and private sectors in protecting the infrastructure that transports fuel, processes energy resources, and brings electricity into our homes. The major portion of critical energy infrastructure in Canada and the United States is privately owned, so industry has a significant stake in ensuring that potential weaknesses are hardened, and recovery and repairs can be accomplished in real time.

Supply and production are strongly linked; “no fuel, no power; no power, no fuel.”

Though terrorism has played a significant role in directing attention to vulnerabilities in the United States, natural disasters and consumer demand have been the most recent threats to our energy reliability and security. Many panelists spoke of Hurricanes Katrina and Rita and the devastation those two storms caused in the Gulf Coast region of the United States, but there were also references to the Northeast Blackout and California’s electricity shortages. Panelists also discussed several key lessons on the nature of the

Tom DiNanno
James Young





energy sector that are fundamental to addressing assurance of energy infrastructure. Rep. John Smith explained that restoration and recovery in the energy sector is difficult due to the circular nature of the systems. He aptly pointed out that supply and production are strongly linked; “no fuel, no power; no power, no fuel.”

It is crucial that any planning for disruptions involve both the public and private sectors.

The energy system heeds a model of rapid restoration over assurance, an approach that is unique to the sector. Industry representatives spoke of their companies’ commitment to quick repair and early detection of failure. The presentation from Ed Tymofichuk of Manitoba Hydro outlined ways that electricity infrastructure can be compromised by natural causes like severe weather, or simple human intervention such as shredded aluminum foil showered over a transformer. The difficulty in predicting or preventing system disruptions was contrasted with a wide variety of quick recoveries and system redundancies, showing how such incidents are much more easily remedied by adjusting the system, making diversions, or cooperating across the industry to make efficient repairs. Paul MacGregor of TransCanada Energy explained that redundancies, storage on both ends of the supply chain, and seamless integration of infrastructure allowed the oil and natural gas system to adjust when Hurricanes Katrina and Rita compromised portions of the natural gas supply chain. Concerns were raised, however, that redundancies that allow the system to be flexible and the capacities needed for quick repair require significant upfront capital, and future expansion of the system may bring efficiencies that save money, yet undermine rapid restoration.

Given that the energy sector has unique needs when it comes to securing infrastructure and assuring supply, it is crucial that any planning for disruptions involve both the public and private sectors. The United States has developed a framework for protecting infrastructure called the National Infrastructure Protection Plan (NIPP); Tom

DiNanno of the U.S. Department of Homeland Security provided an overview of the U.S. federal efforts to oversee infrastructure protection. DiNanno discussed the NIPP, a public-private partnership, and called for the joint creation of a Sector Specific Plan tailored uniquely to the needs of the energy system; industry has been at the table, writing the document from the start. A strong international annex was written in consultation with the Department of State to provide a place to work with countries, such as Canada, who share a stake in protecting infrastructure. The U.S. efforts have involved cataloguing of infrastructure, which led to some discomfort from industry. Issues of data security and keeping such a list current were among concerns. Approaching infrastructure protection by itemizing and prioritizing can be contrasted with an approach that allows threats to drive what information is collected.

If damage to energy infrastructure leads to an emergency situation on either side of the border, economic impacts could be enormous.

James Young was on hand to discuss Canada’s effort at creating a critical infrastructure protection plan at the federal level. Canada is quite deliberate, developing a plan that is “evergreen” and has received much attention for that effort. Past plans did not integrate well and showed the government’s tendency to create silos. There needs to be one voice, Young said, with plans integrated across the government as well as with the private sector. The Canadian approach involves less prescription and more guidelines, and has not tried to assemble a great deal of information; on the other hand, the Canadian approach has encouraged industry to keep information and be prepared to hand it over when needed, rather than relying on the government to keep a current record of key resources. There was some discussion of Alberta’s provincial efforts at creating an infrastructure protection plan, and the involvement of industry in the planning was cited as a good reason for its success. Canada considers

preparedness an evolving concept, and plans to constantly reconsider its definition.

An additional development in energy assurance is the recent designation of the North American Electric Reliability Corporation (NERC) as the electric reliability organization (ERO) for the United States. It is hoped that NERC will be approved as the ERO for Canada by the end of 2007. Rather than setting guidelines and facilitating communication as it has in the past, NERC will be a self-regulating international group with enforcement responsibility. NERC's David Nevius explained that the new incarnation of NERC will develop standards, monitor compliance, and conduct readiness audits. The NERC's first reliability assessment as an ERO was released on October 16, 2006 and at the time of the conference, Nevius revealed that many concerns raised by panelists and participants had already been noted in the report; guidelines are being developed to address them. He estimated that NERC will be a fully functional ERO by June 2007, changing the regulatory environment by moving from industry best-practices and suggested guidelines to enforceable standards.

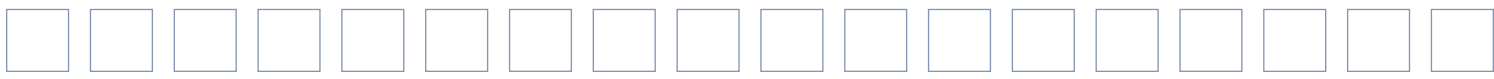
Critical infrastructure protection will only be effective if it develops as a shared responsibility in both countries between the public and private sectors.

Recent changes to the regulatory environment are of great interest to industry, which is constantly trying to assess whether it is in compliance with the whole range of guidelines, regulations, and standards. The law firm Van Ness Feldman has a practice that works with industry to answer such questions, and VNF associate Patrick Currier was able to explain the challenges that were revealed in this area of public-private interface. The absence of regulation is a difficult position for energy companies; regulatory gaps make infrastructure more vulnerable and confuse future planning. Industry must assess whether to wait for regulations to come along or otherwise be pro-

active and develop their own standards and guidelines individually or in cooperation with other companies, and then hope that future regulations will not nullify their efforts. Others industry representatives addressed the difficulty of sharing information in a transparent process, and voiced concerns that data would be secure and used only for assurance purposes.

The organizers also brought in two panelists to speak as facilitators of public-private partnerships. Matt Morrison of the Pacific Northwest Economic Region (PNWER) described the cross-border regional efforts at assuring infrastructure. The human relationships and trust that are key to helping industry, government, and regulatory agencies cooperate are more easily developed at a regional level, where the perception of shared interests and perspectives is stronger. PNWER has learned that planning and running exercises is most successful when all stakeholders truly own the process; they fund, lead, and participate in the process. As a consultant to both public and private sector stakeholders, Mike Armstrong of ICF International deconstructed the expectations of industry, regulators, and even the U.S. executive and legislative branches: both what each expected to contribute, and what others expected of them. Armstrong felt that the term "public-private partnership" is almost a cliché, and is thrown around as a panacea in emergency planning. Public-private partnerships can, in fact, be meaningful, but they require true commitment of time and resources, voluntary participation, and an added value which can be measured. There was agreement that early involvement of both sides and the building of trust and human relationships were important when public and private sectors work together on planning for disaster response.

During the luncheon portion of the forum, Parliamentary Secretary to the Minister of Public Safety The Hon. Dave Mackenzie spoke of how Canada's new government is working with its counterparts in the U.S. Departments of Energy and Homeland Security as well as with the private sector in both countries to protect the shared critical energy infrastructure. Canada exports more oil to the United States than any other country and also provides its southern neighbor with large



amounts of natural gas, uranium, and electricity. The two countries are becoming increasingly dependent on each other in the area of energy. Incidents or disruptions that earlier may have been isolated to one area can now cause a chain reaction on both sides of the border and have a significant economic impact. Mackenzie spoke about the August 2003 blackout that started out as a minor problem at a power company in Ohio but quickly spread to significant parts of the Northeast and Ontario that left more than 50 million people without power and cost billions of dollars to repair. If damage to energy infrastructure leads to an emergency situation on either side of the border, economic impacts could be enormous because of the potential disruption of the enormous flow of goods and services that cross the border each day. To help make sure that such an event never occurs, officials on both sides of the border are working together to construct joint vulnerability assessments of critical cross-border energy infrastructure. Workshops are being conducted on pipeline security and other threats to the energy industry, and a newly designed protocol has been put in place to move people and equipment across the Canada-U.S. border to respond to energy emergencies. Both governments



**Parliamentary Secretary
to the Minister of Public
Safety Dave Mackenzie**

are also working closely with the private sector, which owns 85% of the energy infrastructure. Government agencies monitor seismic activity near critical dams and nuclear facilities, and are increasing their protection of oil, gas, and electric facilities. Critical infrastructure protection will only be effective if it develops as a shared responsibility in both countries between the public and private sectors.

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