

**U.S. - CANADA**  
**CLEAN ENERGY DIALOGUE**



**2010 Conference**  
**Increasing Trade in Clean Electricity**

**Summary Report**

# U.S.-Canada Clean Energy Dialogue

2010 Conference

Increasing Trade in Clean Electricity

May 19–20, 2010

## Summary Report

### Clean Energy Dialogue Background

The Clean Energy Dialogue (CED) was announced in February 2009 when U.S. President Barack Obama and Canadian Prime Minister Stephen Harper met in Ottawa. The two leaders charged the CED with three priorities to reduce greenhouse gases and combat climate change in both countries: (1) expand clean energy research and development, (2) develop and deploy clean energy technology, and (3) build a more efficient electricity grid based on clean and renewable energy. U.S. Energy Secretary Steven Chu and Canadian Minister of the Environment Jim Prentice serve as the lead government officials for the CED. In September 2009, a CED [Action Plan](#) (PDF 702 KB) and [First Report](#) (PDF 71 KB) were created for the Prime Minister of Canada and the President of the United States of America.

The CED recognizes the importance of clean electricity trade as a pathway to achieving renewable energy and greenhouse gas emission reduction goals. The North American electricity market is deeply integrated across national borders. This substantial extent of interconnection between both nations and the relative ease of transferring power across the border has led to a trading relationship where both countries benefit from seasonal differences in electricity demand and a more widely diversified generation resource mix than would be possible without trade. The integration between the two countries, both in infrastructure as well as management and oversight of the electricity system, indicates a common interest in understanding and addressing key policy and market trends, including the increasing supply of clean energy and associated transmission; load management, demand response, and energy storage; and smart grid technologies.

### 2010 Conference: Increasing Trade in Clean Electricity

The 2010 CED Conference, Increasing Trade in Clean Electricity, brought together key stakeholders from the United States and Canada to identify potential resources and markets for increased trade in clean electricity and ancillary services between both countries. Conference participants representing the U.S. and Canadian governments and the U.S. and Canadian electric industries discussed opportunities for clean energy and electricity trade between the two nations.

Over the course of the conference, panelists and audience members discussed several key issues, including the current state of electricity trade between the United States and Canada, the potential for clean energy trade and the barriers to it, and the future role of electricity trade. The discussions

led to the identification of several areas that will hinder or improve clean electricity trade between the two nations. These areas are detailed in this report.

## Introductory Remarks

The Honourable Christian Paradis, Minister of Natural Resources, Canada, gave the keynote address at the conference. He noted that a bilateral declaration on carbon capture and sequestration between Natural Resources Canada and the U.S. Department of Energy was just announced. Minister Paradis stressed that clean energy can help to meet climate change goals, reduce emissions, lower electricity prices, and increase resource reliability.

Minister Paradis spoke about the infrastructure connections between the United States and Canada and the trade of all energy resources, including electricity. The system for electricity, in particular, runs in a two-way flow with more than 30 major transmission lines crossing the U.S.-Canada border.

He spoke about the strategic importance of Canadian hydropower in the U.S.-Canada electricity trade and the role of hydro storage in helping to integrate intermittent renewable sources like wind. He emphasized the importance of ensuring free trade in electricity, which contributes to improved reliability and system adequacy at reasonable prices to consumers.

Patricia Hoffman, Principal Deputy Assistant Secretary and Assistant Secretary Nominee for Electricity Delivery and Energy Reliability, U.S. Department of Energy, provided welcoming and introductory remarks to the conference. Ms. Hoffman, like Minister Paradis, emphasized the importance of the energy trade relationship between the United States and Canada. The 2003 blackout increased awareness of the two countries' connection, and since then, the United States and Canada have developed technologies to mitigate blackouts of that proportion. The countries are hoping to increase renewable energy deployment and update and expand the grid.

Ms. Hoffman also detailed the various activities being undertaken in renewable energy. U.S. Energy Secretary Chu is eager for officials to deliver the message that the Obama Administration wants to deploy clean energy and reduce emissions. The fiscal year 2010 budget for the U.S. Department of Energy and the American Recovery and Reinvestment Act (United States stimulus legislation) both include strong investments in clean energy.

## Key Areas and Findings

### **Policy and Regulation**

#### *Carbon*

Companies and governments alike need to recognize the impacts of potential carbon regulation on clean electricity trade in both the United States and Canada. Uncertainty regarding federal action on

climate change creates a market risk, but it is recognized that future government policies will target reductions in greenhouse gas emissions.

The politics of increasing electricity rates may be a barrier to achieving environmental objectives such as national carbon reduction goals and may hinder more aggressive targets. Carbon legislation may have an impact on mitigating investment risk for electric infrastructure and clean energy resources.

When asked, the majority of conference participants expressed support for the notion that a price or quantity restriction on carbon is the most effective means for addressing the environmental impacts associated with electricity generation from fossil fuels.

### *Regulatory Structure*

In both the United States and Canada, regulatory certainty is elusive. In Canada, multi-jurisdictional approvals are required for international lines, which increase regulatory uncertainty.

### *Renewable Portfolio Standards*

Several states and provinces have implemented renewable portfolio standards (RPSs) that help to invigorate the clean energy sector. A national RPS discussion may be necessary to address concerns that a national standard may lower standards currently implemented by states and provinces.

Many participants characterized state- and provincial-level RPSs as an interim measure, arising in part from an absence of federal action on carbon regulation. It was recognized that such policies are driven primarily by local jobs creation considerations and have the potential to distort electricity trade flows.

## **Infrastructure and Natural Resources**

The existing infrastructure along the U.S.-Canada border enables the delivery of electric power between the two countries. Both Canada and the United States have abundant natural resources, including Canadian hydropower and U.S. wind resources, which can lead to increased clean electricity trade between the countries.

It was noted that while Canada is the largest supplier of all forms of energy to the United States, Canada's share of electricity exports as a percentage of overall generation is small in comparison to other energy exports. Given its abundance of clean energy resources, there is no reason why electricity exports should not continue to grow with the stimulus of free trade.

Given growing demand, environmental aspirations, and anticipated load from the transportation sector, there will be a role for all forms of clean energy in both countries. There are also cultural differences in the way that various forms of electricity are perceived in the two countries. For example, discussion about incremental hydropower production in the United States is largely limited to existing sites, whereas in Canada, there is substantial potential and support for new large builds. Ensuring sustained cross-border trade can help capitalize on these differences.

Aging infrastructure is a concern—massive investments are going to be required in the electricity sector in the coming decades. Efficient system planning will be key because the decisions that are made now will have impacts for the next 50 years. But this renewal of our infrastructure also creates an opportunity to build additional transmission capacity that will enhance electricity delivery and increase clean electricity trade.

Increased public opposition to infrastructure expansion, however, is a concern. This can create barriers for siting new transmission lines. Additionally, the shrinking workforce population in the electric industry must be addressed while new infrastructure is constructed within and between the two countries.

### *Integration of Variable Generation*

For more-seamless integration of variable generation in the United States, it would be beneficial to consolidate balancing authorities and enable more resource sharing between them. Variable generation will also require intra-hour scheduling for these new resources.

For the wind sector, forecasting creates challenges for system operations. Meeting these challenges will require a better understanding of the interconnected systems and integration of intermittent resources on a continental basis. Although wind studies have been undertaken in the United States, no equivalent studies have been carried out in Canada. A corresponding Canadian report on wind and other renewables integration and systems is needed to align with U.S. studies.

Ancillary services such as load shaping and firming are already very important in the electric industries. In the future, pumped storage facilities will play an increasing role. Ancillary services, such as regulation, are already being sold from Canada to the California market and can support the intermittent resources.

There was discussion of the role of energy storage, as well as live storage from existing hydroelectric facilities, and its potential role in firming intermittent renewables. The latter was characterized as a strategic asset on the North American grid, although there are barriers to making efficient use of such storage on a cross-border basis, including transmission constraints and market barriers.

### *Transmission*

To replace aging infrastructure and expand the current system to accommodate new resources, new transmission lines will have to be built. Limited transmission is a barrier to existing trade between the United States and Canada, and limited capacity will become an increasing problem. Better system planning, as well as mechanisms for cost recovery and cost allocation on interprovincial and interstate transmission lines, will be critical for project deployment and more-efficient systems.

Several issues are associated with the construction of new transmission lines. Transmission construction can take many years, and the siting process is potentially lengthy. Ordering components for 500-kilovolt and larger lines can take up to four years for delivery. Further, policies

that devalue transmission rights can hinder investment necessary to construct new electric transmission. Additionally, if natural gas prices remain low, long-line transmission builds may become economically uncompetitive when compared to gas-fired distributed generation.

### **Trade Opportunities and Barriers**

There are significant regional and geographic opportunities and impediments to electricity trade. The United States and Canada benefit from a strong trade relationship that is unparalleled. Regions of the United States trade directly with provinces in Canada via a two-way flow. However, for clean electricity trade to be seamless, both nations must remove existing barriers to trade and prevent new barriers from being erected. While the U.S. Federal Energy Regulatory Commission has eliminated some trade barriers, others still remain. Free trade and open access to transmission systems are essential for expanding trade in clean electricity between the two countries.

Low natural gas prices will require both countries to make difficult choices. The low price of natural gas will compete directly with cleaner and renewable resources, particularly with the further development of shale natural gas in both the United States and Canada. Additionally, some regions in the United States may resist the importation of Canadian renewable resources because they plan to develop their own natural resources in an effort to spur economic and employment growth within their borders.

There are currently many market risks for clean electricity. Increasing clean electricity trade between the United States and Canada requires long-term investments, which currently have a high level of risk. However, clear federal policy can reduce market risk, which will enable clean electricity trade between the two nations to flourish.

Consumer opposition to higher electricity prices was characterized as an additional barrier to clean energy development. Electricity prices need to rise to enable clean energy development, but price increases are viewed as political anathema. Governments need to communicate honestly with consumers on the need to price the environmental impacts of electricity generation into the market and the role that enhancing clean energy trade can play in price mitigation.

### **Next Steps**

The U.S.-Canada Clean Energy Dialogue has identified several initiatives, which included the 2010 conference on increasing trade in clean electricity. The ideas from this conference, including the key areas and findings, will be conveyed to senior government officials in Canada and the United States.

## Appendix 1

### Pictures from the 2010 Conference



The Honourable Christian Paradis, Minister,  
Natural Resources Canada



Minister Christian Paradis and Assistant  
Secretary Nominee Patricia Hoffman



Shannon Fraser, U.S. Department  
of Commerce



Panel I – Electricity Trade Between the United States and Canada Today



Doug Larson, Western Interstate Energy Board, Western Governors' Association



Conference participants




Reception, hosted by American Superconductor and PPL

## Appendix 2

### Agenda

| <b>Day 1 - Wednesday, May 19, 2010</b> |  |
|--|--|
| 8:00 a.m.                              | Registration Check-in and Continental Breakfast  |
| 9:00 a.m.                              | <b>Welcome Remarks</b> <ul style="list-style-type: none"><li>• Patricia Hoffman, Assistant Secretary Nominee and Principal Deputy Assistant Secretary, U.S. Department of Energy Office of Electricity Delivery and Energy Reliability</li></ul> <b>Keynote Address</b> <ul style="list-style-type: none"><li>• The Honourable Christian Paradis, Minister, Natural Resources Canada</li></ul> <b>Conference Introduction</b> <ul style="list-style-type: none"><li>• Patricia Hoffman, Assistant Secretary Nominee and Principal Deputy Assistant Secretary, U.S. Department of Energy Office of Electricity Delivery and Energy Reliability</li></ul>  |
| 9:30 a.m.                              | Panel I – Electricity Trade Between the United States and Canada Today <ul style="list-style-type: none"><li>• Who are the traders of electricity both in U.S. and Canada?</li><li>• Overview of historical energy trade statistics (2005-present)</li><li>• Existing regulatory structure, both U.S. and Canada<ul style="list-style-type: none"><li>○ Who are the regulators?</li><li>○ What are their roles?</li></ul></li></ul> <b>MODERATOR:</b> Dawn Farrell, Chief Operating Officer, TransAlta Corporation<br><b>PANELISTS:</b> <ul style="list-style-type: none"><li>• <a href="#">Pierre Guimond</a> (PDF 78 KB), President &amp; CEO, Canadian Electricity Association</li><li>• <a href="#">Robin Junger</a> (PDF 1.0 MB), Deputy Minister of Energy and Clean Technology, Office of the Premier, Government of British Columbia</li><li>• <a href="#">The Honourable Jack Keir</a> (PDF 1.3 MB), Minister of Energy, Government of New Brunswick</li><li>• Nick Akins, Executive Vice President, Generation, American Electric Power</li><li>• <a href="#">Mark Corey</a> (PDF 66 KB), Assistant Deputy Minister, Energy Sector, Natural Resources Canada</li></ul> |

|            |  |
|------------|--|
| 11:00 a.m. | Break  |
| 11:15 a.m. | <p>Panel II – Potential Clean Energy Trade</p> <ul style="list-style-type: none"> <li>• Location, scope, and scale of potential clean electricity resources <ul style="list-style-type: none"> <li>◦ Discussion of location, scope, and scale of storage resources</li> </ul> </li> <li>• Potential key markets for clean electricity</li> <li>• Ways to facilitate clean electricity trade</li> </ul> <p><b>MODERATOR:</b> Paul Flemming, Director Power &amp; Gas Services, ESAI Power, LLC</p> <p><b>PANELISTS:</b></p> <ul style="list-style-type: none"> <li>• Johan van’t Hof, President &amp; CEO, Tonbridge Power Inc.</li> <li>• Mary Hemmingsen, Vice President, Business Development, Brookfield Renewable Power</li> <li>• John Douglas, President &amp; CEO, Riverbank Power Corporation</li> <li>• Jacob Irving, President, Canadian Hydropower Association</li> <li>• Martha Wyrsh, President, Vestas Americas</li> <li>• John Dalton, President, Power Advisory LLC</li> </ul> |
| 12:45 p.m. | <p>Lunch</p> <p>LUNCHEON SPEAKER: Shannon Fraser, International Trade Specialist for Energy, International Trade Administration, U.S. Department of Commerce</p>   |
| 2:15 p.m.  | <p>Panel III – Challenges and Barriers to Enhancing Trade in Clean Electricity and Ancillary Services</p> <ul style="list-style-type: none"> <li>• Economic</li> <li>• Regulatory</li> <li>• Infrastructure</li> <li>• Availability of financing</li> </ul> <p><b>MODERATOR:</b> Pierre Guimond, President &amp; CEO, Canadian Electricity Association</p> <p><b>PANELISTS:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Mike MacDougall</a> (PDF 93 KB), Director, Trade Policy, Powerex</li> <li>• <a href="#">Gilbert Bennett</a> (PDF 96 KB), Vice President, Lower Churchill Project, Nalcor Energy</li> <li>• <a href="#">John Larkey</a> (PDF 1.9 MB), Director, Cargill Inc.</li> <li>• <a href="#">Eric Norberg</a> (PDF 1.6 MB), Senior Vice President, Strategy &amp; Planning, Minnesota Power</li> </ul>  |

|                                       |  |
|---------------------------------------|--|
| 4:15 p.m.                             | Wrap-Up of Day 1 of Conference   |
| 5:00 p.m.                             | Reception<br><i>Hosted By:</i><br>   |
| <b>Day 2 - Thursday, May 20, 2010</b> |  |
| 8:00 a.m.                             | Continental Breakfast  |
| 9:00 a.m.                             | Panel IV – The Future Role of U.S.-Canada Electricity Trade<br><br><ul style="list-style-type: none"> <li>• Vision of the future</li> <li>• What is on the drawing board and how it will affect electricity trade</li> <li>• What it will take to get new projects built</li> </ul> <p><b>MODERATORS:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Doug Larson</a> (PDF 2.1 MB), Executive Director, Western Interstate Energy Board, Western Governors’ Association</li> <li>• <a href="#">Gordon van Welie</a> (PDF 1.9 MB), President &amp; CEO, ISO New England Inc.</li> <li>• <a href="#">Bill Marshall</a> (PDF 98 KB), President, WKM Energy Consultants Inc.</li> </ul> |
| 10:30 a.m.                            | Next Steps to Facilitate Clean Electricity Trade<br><br><ul style="list-style-type: none"> <li>• What are the solutions to the challenges presented? <ul style="list-style-type: none"> <li>○ Discussion and prioritization of solutions and other recommendations to facilitate clean electricity trade</li> <li>○ Recommendations</li> </ul> </li> <li>• Discussion of possible implementation strategy</li> </ul> <p>FACILITATED DISCUSSION</p> <ul style="list-style-type: none"> <li>• John Schnagl, Director, Transmission Adequacy, U.S. Department of Energy Office of Electricity Delivery and Energy Reliability</li> </ul>  |
| 11:30 a.m.                            | Wrap-Up and Closing Remarks  |
| 12:00 p.m.                            | Conclusion of Conference   |

## **Appendix 3**

### **Speaker Biographies**

#### **WELCOME REMARKS**

##### **Patricia Hoffman**

Assistant Secretary Nominee and Principal Deputy Assistant Secretary, U.S. Department of Energy  
Office of Electricity Delivery and Energy Reliability

Patricia Hoffman is the Assistant Secretary Nominee and Principal Deputy Assistant Secretary for the Office of Electricity Delivery and Energy Reliability at the U.S. Department of Energy. The Office of Electricity Delivery and Energy Reliability leads the Department of Energy's (DOE) efforts to modernize the electric grid through the development and implementation of national policy pertaining to electric grid reliability and the management of research, development, and demonstration activities for "next generation" electric grid infrastructure technologies. Hoffman is responsible for developing and implementing a long-term research strategy for modernizing and improving the resiliency of the electric grid. Before joining the Office of Electricity Delivery and Energy Reliability, Hoffman was the Program Director for the Federal Energy Management Program which implements efficiency measures in the federal sector and the Program Manager for the Distributed Energy Program that developed advanced natural gas power generation and combined heat and power systems. She also managed the Advanced Turbine System program resulting in a high-efficiency industrial gas turbine product. Hoffman holds a Bachelor of Science and a Master of Science in Ceramic Science and Engineering from Penn State University.

#### **KEYNOTE ADDRESS**

##### **The Honourable Christian Paradis**

Minister, Natural Resources Canada

Christian Paradis was first elected to the House of Commons in 2006 and re-elected in 2008. Mr. Paradis was appointed Secretary of State (Agriculture) in January 2007. He was also appointed Minister of Public Works and Government Services in June 2008. Prior to his election to Parliament, Mr. Paradis had a legal practice specializing in corporate law. He has been actively involved in several support groups and charitable organizations, including the Rotary Club of Thetford Mines. Mr. Paradis graduated from the University of Sherbrooke in civil law and holds a graduate degree in corporate law from Laval University. Mr. Paradis and his wife Julie have three children.

## **PANEL I – ELECTRICITY TRADE BETWEEN THE UNITED STATES AND CANADA TODAY**

### **Dawn Farrell**

Chief Operating Officer, TransAlta Corporation

Dawn Farrell leads the TransAlta Operations group which includes trading, plant operations, engineering, technology, commercial operations, business development, and procurement activities. Prior to becoming COO, Ms. Farrell served as Executive Vice President, Commercial Operations and Development at TransAlta from 2007 to 2009. Ms. Farrell has an extensive history in the electric energy industry, holding roles at TransAlta and BC Hydro. As part of her 23-year career in the industry, she has served as Executive Vice-President, Corporate Development; Executive-Vice President, Independent Power Projects; and Vice-President, Energy Marketing and IPP Development at TransAlta Corporation. From 2003 to 2006, Ms. Farrell served as Executive Vice-President, Generation at BC Hydro. In June 2006, she was appointed Executive Vice-President Engineering, Aboriginal Relations and Generation. She also chairs the Board for TransAlta Cogeneration which jointly owns assets across Canada with Cheung Kong Infrastructure Holdings Limited (CKI). She holds a Bachelor of Commerce degree with a major in finance and a Masters degree in economics from the University of Calgary. Ms. Farrell has also attended the Advanced Management Program at Harvard University.

### **Pierre Guimond**

President and Chief Executive Officer, Canadian Electricity Association

Pierre Guimond was appointed President and Chief Executive Officer of the Canadian Electricity Association (CEA) in May 2008. As President of CEA, Mr. Guimond acts as spokesperson on issues of national concern to the electric utility industry. Prior to joining CEA, Mr. Guimond served as Director, Federal Government Liaison for Ontario Power Generation Inc. (OPG). Since 2003, he was seconded to the Canadian Nuclear Association where he coordinated regulatory activities and guided policy development initiatives aimed at improving the nuclear legislative and regulatory frameworks. He also served as spokesperson for the nuclear industry and contributed to building public acceptance for nuclear power's re-emergence as a viable energy option in Canada. Throughout his extensive career, Mr. Guimond has worked in a wide range of government relations as well as political roles. From 1991 to 1999 he was the head of government relations at CEA, and prior to that managed Consumer and Corporate Affairs Canada's (now Industry Canada) Grants and Contributions Program where he implemented a regulatory program in the area of consumer protection. Originally from Sudbury, Ontario, Mr. Guimond has lived in the National Capital Region for over thirty years. He holds an Honours B.A. in Political Science from Carleton University.

### **Robin Junger**

Deputy Minister of Energy and Clean Technology, Office of the Premier, Government of British Columbia

Robin was recently appointed Deputy Minister of Energy and Clean Technology, Office of the Premier of BC. He is responsible for leading and coordinating the work of various provincial

agencies as they pursue the government's stated goal of becoming a clean energy powerhouse. Robin was integrally involved in the development of BC's new Clean Energy Act, which was introduced into the legislature on April 28, 2010. Prior to this role, Robin served as Associate Deputy Minister, BC Environmental Assessment Office, leading the review of major energy, transmission, mining, infrastructure and other projects. He is a lawyer by trade and previously spent 10 years in private practice, working mainly in the areas of environmental, aboriginal and administrative law. Robin holds a BA in Political Science from the University of Calgary, a LL.B. from the University of British Columbia and a LL.M. from Harvard Law School. He served as a Law Clerk to the BC Court of Appeal and has taught both public and private international law at the University of Victoria Faculty of Law.

### **The Honourable Jack Keir**

Minister of Energy, Government of New Brunswick

Jack Keir was first elected to the Legislative Assembly of New Brunswick in the provincial election held September 18, 2006. He was appointed Minister of Energy and Minister Responsible for Efficiency New Brunswick by Premier Shawn Graham in October 2006. Between 1995 and 2002, Keir held the position of General Manager for the Saint John Harbour Bridge Authority where he managed all bridge operations. From the years 2002 – 2006 he headed up the Fundy Region Solid Waste Commission. While serving as Minister of Energy, the province of New Brunswick has witnessed tremendous growth in the energy sector. Keir is committed to growing the energy sector in New Brunswick, and passionate about creating an Energy Hub. Minister Keir and the New Brunswick Department of Energy have been successful in partnering with world class companies who have taken a keen interest in the regions energy potential, and are committed to its growth. Jack currently resides in Grand Bay Westfield, New Brunswick with his wife Barbara.

### **Nick Akins**

Executive Vice President, Generation, American Electric Power

Nick Akins is executive vice president – Generation for American Electric Power. AEP is one of the largest electric utility and generators of electricity in the U.S. He is responsible for all generation activities of AEP's 38,000 MW fleet, including fossil and hydro generation; nuclear generation; engineering, project and field services; fuel, emissions and logistics, and business services. Previously, he was president and chief operating officer for Southwestern Electric Power Company, serving approximately 439,000 customers in Louisiana, Arkansas and northeast Texas. Prior to this, Akins was vice president - energy marketing services, responsible for directing the activities of Market Development, including the transmission marketing and services functions, Energy Delivery External Affairs including community affairs, economic development, advocacy for regulatory and legislative positions within Energy Delivery. Previous to CSW's merger with AEP, he served in various director and manager roles including CSWS director - restructuring readiness, CSWS director - mergers and acquisitions, CSWS director - solid fuels, WTU director - fuels, and other positions within system dispatch operations, planning, and fuels. He received a bachelor's degree in 1982 in electrical engineering from Louisiana Tech University in Ruston and a master's degree in electrical engineering in 1986 from Louisiana Tech.

**Mark Corey**

Assistant Deputy Minister, Energy Sector, Natural Resources Canada

Mark Corey is the Assistant Deputy Minister, Energy Sector, Natural Resources Canada. Mark has also held the position of Assistant Deputy Minister, Earth Science Sector, Natural Resources Canada; Vice-President / ADM of The Leadership Network (part of the Treasury Board Portfolio); ADM, Market and Industry Services Branch at Agriculture and Agri-food Canada; and Associate ADM, Operations Sector at Industry Canada. Mark is a graduate of the University of Western Ontario, where he obtained Bachelor's and Master's degrees in Political Science. He was a course participant in the Advanced National and International Studies Program at the National Defense College in Kingston.

**PANEL II – POTENTIAL CLEAN ENERGY TRADE**

**Paul Flemming**

Director, Power and Gas Services, ESAI Power, LLC

Mr. Flemming directs ESAI's Power and Gas Practice and has been with the firm since 1999 after over six years as Trading Manager with both Koch Industries and Caltex Petroleum. Mr. Flemming has been a part of ESAI's Power and Gas team for over six years and has expertise in the dynamics of Northeast Power Market analytics including Power Flow modeling and Locational Marginal Price analysis and has particular expertise in the developing capacity markets. Mr. Flemming also has direct responsibility for the firm's natural gas capability. Mr. Flemming has 25 years global experience in the international energy arena in the areas of: power market analysis, generation and transmission project economic feasibility, trading and supply, strategic planning, project development and refinery operations. Mr. Flemming is a registered CTA, Commodity Trade Advisor with the National Association of Securities Dealers (NASD).

**Johan van't Hof**

President and Chief Executive Officer, Tonbridge Power Inc.

He is President and Chief Executive Officer of Tonbridge Power Inc. He has been responsible for managing the executive team directing the completion of the Montana Alberta Tie Project which is now in construction after the successful receipt of six major international permits. Mr. van't Hof has several years experience in project finance and utility privatization transactions. Prior to Tonbridge Power, he was a project finance and privatization partner at PricewaterhouseCoopers for ten years where he was head of the electricity practice. While there, Mr. van't Hof completed electricity financing projects and privatizations in several countries around the world, as well as financing and privatization transactions involving airports, correctional facilities and roads. He received an MBA from the Rotman School of Business at the University of Toronto, and is a chartered accountant in Ontario. He was born in the Netherlands and is a dual citizen with Canada. He and his wife have been married for thirty one years and have three adult sons.

### **Mary Hemmingsen**

Vice President, Business Development, Brookfield Renewable Power

Mary Hemmingsen joined Brookfield in 2009 in the role of Vice President Government and Stakeholder Relations for Brookfield Renewable Power's Canadian Operations. In 2010 her role was expanded to include Business Development and Commercial Affairs for North America. Mary is responsible for relationship management, marketing and commercialization associated with Brookfield's long term generation and transmission interests. Mary spent over a decade in senior roles in the electric power generation, transmission and distribution business, ranging from Corporate Development and Finance, Planning and Acquisition, Asset Management and Project Development and Procurement. Currently, Mary is on the Board of the Canadian Electricity Association, the Association of Power Producers of Ontario and serves on many associations, committees and task forces in the electric utility industry in North America. Mary is a Chartered Accountant and in addition to industry Board work she continues to serve on other boards as well as finance and audit committees.

### **John Douglas**

President and Chief Executive Officer, Riverbank Power Corp.

Mr. Douglas is the founder, President and CEO of Riverbank Power Corp. He is also the CEO and founder of Douglas Capital Inc. where he is responsible for the principal investing activity at the firm. Mr. Douglas is also the co-founder and a Director of Transmission Developers Inc. He earned his Bachelor's Degree in Economics at the University of Waterloo in 1985. Until recently, Mr. Douglas served as the President and CEO of Ventus Energy Inc., a company which he co-founded in 2004 to develop wind farms in Canada. In 2007, Ventus was acquired by Suez Energy for \$140 million, and Mr. Douglas was promoted to Chief Operating Officer of wind development for Suez Renewable Energy North America. Mr. Douglas has now left the wind industry to pursue new investment opportunities. Prior to founding Douglas Capital Inc. in 2002, Mr. Douglas was Co-Head of Investment Banking, Senior Vice President and Director at Canaccord Capital in Toronto. Mr. Douglas is a Chartered Accountant and Chartered Business Valuator.

### **Jacob Irving**

President, Canadian Hydropower Association

Mr. Jacob Irving has over 10 years of experience as an association manager and government relations specialist. He holds a B.S.Sc. in Political Science from the University of Ottawa. Most recently, Mr. Irving was Executive Director of the Oil Sands Developers Group (OSDG), where he acted as spokesperson for that association with a wide range of stakeholders in the energy industry, including municipal, provincial and federal governments, and aboriginal groups. Before his time at OSDG, Mr. Irving worked in government and in the petroleum energy sector in Canada and overseas. Founded in 1998, the Canadian Hydropower Association (CHA) is the national association dedicated to representing the interests of the hydropower industry. Hydropower is the number one electricity source in Canada - about 60% of electricity production comes from hydropower - and the leading renewable energy.

**Martha Wyrsh**

President, Vestas Americas, USA

Martha B. Wyrsh is President of Vestas Americas, the North American arm of Vestas Wind Systems, the world's largest manufacturer of wind turbines. Wyrsh sits on the Executive Committee for the parent company which is based in Denmark. She is also a member of the Board of Directors of SPX Corp based in Charlotte, North Carolina. Prior to joining Vestas, Wyrsh served as CEO for Spectra Energy Transmission and a member of the Spectra Energy Corp Board. Prior to that she was CEO of Duke Energy Gas Transmission and in both roles was responsible for the natural gas transmission, storage and distribution businesses in the United States and Canada as well as natural-gas gathering, processing and liquid sales businesses in Canada. A native of Laramie, Wyoming, Wyrsh received a law degree from George Washington University and bachelor's degree from the University of Wyoming. She also completed the Harvard Business School Advanced Management Program.

**John Dalton**

President, Power Advisory LLC

John Dalton, President of Power Advisory, combines a strong understanding of wholesale power market fundamentals and the requirements for generation project development with a broad economic analysis and energy policy background. John recently completed a study for Natural Resources Canada evaluating the issues associated with the development and use of electricity storage to better enable the integration of renewable energy technologies and to support trade between the US and Canada. He has advised numerous parties regarding market opportunities offered by exporting and importing power from all major Canadian power markets to the US. Projects include evaluating the economic opportunity offered by the sale of nuclear generation from the Maritimes to New England and a study for CanWEA regarding the opportunity offered by wind power exports from the Maritimes to the US Northeast. In addition, he has assessed transmission access in these markets, market prices and the ability and willingness of buyers in the Northeast to enter into long-term contracts. He recently quantified the economic value of a proposed major HVDC transmission line that would interconnect Manitoba, Saskatchewan and Alberta for a consortium of electric utilities and provincial governments. John has a B.A. in Economics from Brown University and an M.B.A from Boston University.

**LUNCHEON SPEAKER**

**Shannon Fraser**

International Trade Specialist for Energy, Office of Energy and Environmental Industries,  
International Trade Administration, U.S. Department of Commerce

Shannon Fraser serves as an International Trade Specialist for the Energy Sector in the Office of Energy and Environmental Industries (OEEI) at the U.S. Department of Commerce (DOC) in Washington, D.C. Along with a team of fifteen energy and environmental analysts, Shannon works in partnership with U.S. companies to advance exports of U.S.-manufactured clean energy

technologies in overseas markets. Shannon's focus areas in the energy sector have included 1) clean coal technology, 2) power transmission and distribution (including smart grid), 3) energy efficiency, 4) biofuels, and 5) European energy issues. Shannon's recent collaborations with U.S. government, foreign government, and smart grid trade associations have focused on advancing exports of U.S.-manufactured smart grid technologies and developing information exchanges with overseas public-private sector smart grid specialists. Shannon holds a B.A. from U.C. Berkeley and a Master's in Pacific International Affairs from U.C. San Diego. Prior to relocating to Washington, D.C., Shannon has resided in France (Lyon) and Japan (Fukuoka and Nagoya).

### **PANEL III – CHALLENGES AND BARRIERS TO ENHANCING TRADE IN CLEAN ELECTRICITY AND ANCILLARY SERVICES**

#### **Pierre Guimond**

President and Chief Executive Officer, Canadian Electricity Association

Pierre Guimond was appointed President and Chief Executive Officer of the Canadian Electricity Association (CEA) in May 2008. As President of CEA, Mr. Guimond acts as spokesperson on issues of national concern to the electric utility industry. Prior to joining CEA, Mr. Guimond served as Director, Federal Government Liaison for Ontario Power Generation Inc. (OPG). Since 2003, he was seconded to the Canadian Nuclear Association where he coordinated regulatory activities and guided policy development initiatives aimed at improving the nuclear legislative and regulatory frameworks. He also served as spokesperson for the nuclear industry and contributed to building public acceptance for nuclear power's re-emergence as a viable energy option in Canada. Throughout his extensive career, Mr. Guimond has worked in a wide range of government relations as well as political roles. From 1991 to 1999 he was the head of government relations at CEA, and prior to that managed Consumer and Corporate Affairs Canada's (now Industry Canada) Grants and Contributions Program where he implemented a regulatory program in the area of consumer protection. Originally from Sudbury, Ontario, Mr. Guimond has lived in the National Capital Region for over thirty years. He holds an Honours B.A. in Political Science from Carleton University.

#### **Mike MacDougall**

Director, Trade Policy, Powerex Corp.

Mike has been at Powerex for 11 years and currently is a member of the Executive Team, Director of Trade Policy and the Executive responsible for IT. During his tenure Mike has been actively involved in many aspects of the electricity industry, with particular focus on market design, transmission tariffs, business practices and the interplay between transmission rules and the energy markets they facilitate. Mike leads a team of professionals that cover the many regions in North America where Powerex conducts its business. With respect to IT, Mike provides the link between the company's strategic business direction and the continued enhancement and evolution of the IT program. Prior to joining Powerex, Mike spent 7 years in the Natural Gas Industry following the deregulation of interstate natural gas transmission and was responsible for rate design and contracts for a major Canadian Natural Gas Pipeline.

### **Gilbert Bennett**

Vice President, Lower Churchill Project, Nalcor Energy

In September 2007, the Government of Newfoundland and Labrador released a provincial Energy Plan which announced the transformation of Newfoundland and Labrador Hydro into a provincial energy corporation. The energy corporation, officially named Nalcor Energy last December, has five lines of business: Newfoundland and Labrador Hydro, Churchill Falls, Lower Churchill Project, Oil and Gas and Bull Arm Fabrication. Gilbert Bennett is the Vice President of the Lower Churchill Project. He joined the company in May 2005 and is responsible for the development of the 3,000 MW lower Churchill hydroelectric resource in Labrador – one of the best undeveloped hydroelectric sites in North America. Gilbert is a former Vice President of 360networks Canada, and has served in a number of senior engineering and operations roles with GT Group Telecom Services, Cable Atlantic and Newfoundland Telephone/Aliant. Gilbert is a member of the Professional Engineers and Geoscientists of Newfoundland and Labrador. He has a Bachelor of Engineering (Electrical) degree from Memorial University of Newfoundland.

### **John Larkey**

Director, Cargill Power and Gas Markets

In 1992, John joined Cargill as a mechanical engineer from the University of Minnesota and started his career in operations management in Cargill's sodium chloride refinery in the San Francisco Bay Area. After four exciting years full of professional challenges and opportunities working for Cargill, John returned to school to pursue his MBA at the University of Michigan in Ann Arbor. Following graduate school, John had a brief tour in management consulting with PriceWaterhouseCoopers Strategy Management Practice where he worked with high-tech industry customers and developed business plans to launch two start-up ventures. John returned to Cargill in 1998 to pursue his passion for international business and helped Cargill's North America power joint venture trading business expansion into the newly deregulated California market. Since 2006, John has worked in energy and is currently Director of Marketing and Commercial Development for Cargill Power and Gas Markets North America.

### **Eric R. Norberg**

Senior Vice President, Strategy and Planning, Minnesota Power

Eric is a native of Northeastern, Minnesota. He holds a BS Electrical Engineering Degree from the University of Minnesota and a Masters of Management Degree from the College of St. Scholastica. He is a Professional Engineer and a Member of IEEE. Eric joined Minnesota Power in 1979 as a Transmission Planning Engineer. He has been responsible for Generation Planning, Fuel and Rail Strategy and Large Power Customer relations. Since February 2007, he has held the position of Senior Vice President – Strategy and Planning for Minnesota Power, an ALLETE Company. He is a member of the Executive Team responsible for MP's resource planning, developing and implementing a growth strategy, and managing our short energy supply. He resides in Duluth, Minnesota.

## **PANEL IV – THE FUTURE ROLE OF U.S.-CANADA ELECTRICITY TRADE**

### **Doug Larson**

Executive Director, Western Interstate Energy Board, Western Governors' Association

Doug Larson is the Executive Director of the Western Interstate Energy Board, an association of 11 western states and three western Canadian provinces. Members of the Board are appointed by the governor or premier. The Board serves as the energy arm of the Western Governors' Association. Larson provides staff support to the new Western Interconnection State-Provincial Steering Committee on transmission, the Western Interconnection Regional Advisory Body established by Western Governors under Section 215 of the Federal Power Act, and the Committee on Regional Electric Power Cooperation, which includes the regulatory, planning and facility siting agencies from the states and provinces in the Western Interconnection.

### **Gordon van Welie**

President and Chief Executive Officer, ISO New England Inc.

Gordon van Welie is President and Chief Executive Officer of ISO New England Inc., having previously served as the company's executive vice president and chief operating officer. Recently Mr. van Welie has directed ISO initiatives to analyze renewable power integration and pursue smart grid technology applications. He also serves as a member of ISO New England's Board of Directors and is a prior Chair of the ISO/RTO Council. He joined ISO New England from Siemens Power Transmission & Distribution LLC, where he served as vice president and general manager of the Power Systems Control Division and was responsible for delivering and supporting power system automation and information technology solutions for electric companies. Before moving to Siemens, Mr. van Welie held the position of Chief Engineer at ESKOM, South Africa's electric utility based in Johannesburg. Mr. van Welie holds a Bachelor of Science degree in Electrical Engineering and a Masters degree in Business Administration from the University of Witwatersrand in Johannesburg, South Africa.

### **William K. (Bill) Marshall, P. Eng.**

President, WKM Energy Consultants Inc.

William K. (Bill) Marshall holds Bachelor's degrees in Engineering and Education and a Master's degree in Power Systems Engineering. His career includes 8 years teaching at the secondary and college level and 30 years in the utility industry. This has been mainly as a power system planner, corporate strategist and policy advocate with NB Power for 24 years. He served as the President and CEO of New Brunswick System Operator (NBSO) since 2004 where he set up the original organization and positioned it to become the central transmission organization and Reliability Coordinator of the Maritimes Area. He was a member of the New Brunswick Market Design Committee and has also served on numerous other provincial, regional, national and international committees through various industry organisations. He retired from NBSO in 2008 and has since been doing independent consulting in the power business through his company WKM Energy

Consultants Inc. He has done contract work for several agencies in Atlantic Canada, Quebec, Ontario and Saskatchewan.

### **NEXT STEPS TO FACILITATE CLEAN ENERGY TRADE**

#### **John Schnagl**

Director, Transmission Adequacy, U.S. Department of Energy Office of Electricity Delivery and Energy Reliability

John Schnagl serves as Director Transmission Adequacy with the U.S. Department of Energy's Office of Electricity Delivery and Energy Reliability in Washington, DC. Prior to taking this position, he worked for 22 years with the Federal Energy Regulatory Commission where he advised the Commission on proposed hydroelectric projects, natural gas pipelines, and electric transmission as well as the adequacy of the nation's energy infrastructure. His federal career started in Omaha, Nebraska with the Corps of Engineers. He has a B.S. from the University of California at Davis and an M.S. from the University of Nebraska, Lincoln.