

SUMMARY REPORT
JULY, 2015

**NATIONAL
POLICY
SYMPOSIUM**

**ON ENERGY DELIVERY
AND MANAGEMENT:**

**PATHWAYS
TO INNOVATION**

Sponsors:

ACKNOWLEDGEMENTS

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Layout

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INTRODUCTION

The 2015 Energy and Mines Ministers' Conference (EMMC) Co-Hosts, the Nova Scotia Department of Energy and Natural Resources Canada, partnered with QUEST – Quality Urban Energy Systems of Tomorrow, to deliver the *National Policy Symposium on Energy Delivery and Management: Pathways to Innovation* in preparation for EMMC 2015.

Across Canada, there are important innovations happening in the energy sector that are making the production, distribution, and use of energy cleaner, more efficient, more affordable, and more reliable. New technology is influencing how we think about and operate our energy delivery and management systems. The challenge is that technological innovation is happening at a pace that is often difficult for policy and regulation to keep up with.

The most impactful innovations are taking place at the local level, where technological innovations in energy service delivery and in energy management can lead to lower energy costs, enhanced reliability, greater environmental performance, and local economic benefits for consumers, industry and governments.

The Symposium provided an opportunity for more than 80 senior representatives from government, industry, utilities, regulators, and not-for profit organizations from across Canada to share insights, solutions, and best practices about how to accelerate the uptake of technological innovations in the energy delivery and management sector in Canada.

SYMPOSIUM OVERVIEW

The Symposium was divided into two organizing themes: New Energy Service Delivery Models, and Energy Management. These themes were explored from a technical, policy, program, and regulatory perspective. Following are the principal observations and conclusions from the Symposium.

NEW ENERGY SERVICE DELIVERY MODELS

Energy Delivery Systems (electricity, natural gas, thermal energy, storage) are being fundamentally changed through the emergence of new technologies, more affordable energy options, evolving customer expectations, changing weather patterns, environmental demands, and the increasing demand for supply reliability and system resilience.

Discussion Insights

Innovation benefits from clear policy direction and government collaboration

The current regulatory environment was designed to maintain system integrity resulting in the use of familiar low-risk technologies. It was not designed to incent, reward or accommodate innovation, promote the broader long-term public interest, or to respond to energy efficiency, conservation or climate change goals. As a result, there is little incentive to move beyond traditional business practices in the energy delivery sector.

Measured risk taking – to learn and to align policy – can drive new energy service delivery opportunities

The primary means of delivering energy (pipes, wires) is unlikely to change in the foreseeable future. What is changing, however, is the need to evaluate how new services (district energy, energy storage, distributed energy etc.) and sources (solar, wind, tidal, combined heat and power, etc.) can be properly integrated with traditional energy delivery infrastructure. This requires a reexamination of business operating models, related policies, and regulations.

Responding to consumer needs and market opportunities requires funding for innovation

Technological innovations in energy delivery are usually local and community-led where there is often insufficient access to start-up capital to facilitate successful project development and deployment. In addition, and complicating the issue, there is a need for unique solutions in every community. New energy sources and solutions have to be integrated into existing energy delivery systems in a Canadian market where capabilities are still developing. Innovation funding models, such as utility rate-based levies, feed-in-tariffs, or carbon pricing regimes present opportunities to allocate funds toward innovation in energy management and delivery.

ENERGY MANAGEMENT

Energy management solutions are emerging that link different energy sources, delivery systems, information systems, and storage systems. This is providing consumers (homeowners and businesses) with more options to better manage energy such as how much to use, when to use it, and what sources to tap and when.

Discussion Insights

Innovation is accelerated when policy, local priorities, and the capacity to deliver are aligned

Creating the conditions for successful innovation requires good leadership and management, effective alignment of policies and local priorities (meeting consumer and community needs), a common vision, and the capacity to deliver. The best solutions are often found through maintaining diversity in terms of solutions for fuels, technology, business, and regulatory models.

Responding to consumer needs and market opportunities requires access to energy data

Utilities, customers, and entrepreneurs are beginning to draw on and benefit from having access to better sources of energy data. For data to be used effectively it needs to be consistent, reliable, and accessible.

Support for innovation is strengthened when there is community buy-in

Canadians acknowledge the economic value and importance of energy development and planning. However, there remains low confidence that it will be done responsibly and sustainably, and the bar for public support has been set ever higher in recent years. One option for getting to this local level of support is through regional and community energy plans which can serve as an economic or innovation framework for communities.

KEY MESSAGES TO ESTABLISH PATHWAYS FOR INNOVATION

Through interactive discussions during breakout sessions among participants, six key messages were identified to advance pathways for innovation for the energy delivery and management sector in Canada, including:

1. Efficient Government Collaboration is Critical

Within government, existing intergovernmental working groups and organizations should be used to advance a comprehensive energy innovation agenda.

Innovation in Action

The Energy and Mines Ministers' Conference Energy Steering Group brought together industry and government decision-makers to identify the pathways to accelerate innovation in the energy delivery and management sector in Canada at the *National Policy Symposium on Energy Delivery and Management: Pathways to Innovation*.

2. Take Risks, but Lots of Small Measured Ones

Some level of risk is required to support innovation. To help minimize risk, piloting new technology and testing policy and financing models were encouraged. For example, this might involve exploring utility rate-based levies or the application of feed-in-tariffs for innovative projects to understand the types of performance-based mechanisms or other checks and balances that need to be put in place to support innovation. The approach taken would likely vary in each province and could be drawn from sources, such as conservation demand management (CDM), and demand side management (DSM). The use of carbon pricing was also cited as an example of how energy delivery innovation could be advanced.

Innovation in Action

- Gaz Métro administers a levy on their utility bills that supports the Natural Gas Technology Centre (NGTC). This is a unique way to finance innovation. The NGTC is a non-for-profit organization that builds partnerships to promote technological development and advance the efficient use of natural gas and renewable energy.¹
- Fortis BC built a mix of high-efficiency condensing boilers and geo-exchange systems in nineteen educational buildings in the BC Delta School District. This was possible as a result of a new regulatory arrangement. With the approval of the BC Utilities Commission (BCUC), FortisBC built, operates and maintains the systems and the Delta School District pays the BCUC a regulated rate for thermal energy.²
- The Province of Ontario launched the Smart Grid Fund in 2011 to support projects that help conserve energy, manage costs, and support new technologies like electric vehicles and energy storage.³
- In Alberta, the Climate Change and Emissions Management Corporation (CCEMC) operates the Climate Change and Emissions Management Fund, which is sourced from industry and made available to the CCEMC through a grant from the Government of Alberta.⁴ The Fund is being used to support local energy distributors like ENMAX and ATCO to incorporate new energy sources such as solar, wind, and combined heat and power into an existing energy distribution system.
- NRStor set out to develop and install energy storage flywheel technology in Ontario, but discovered that energy storage did not fit within the current policy and regulatory frameworks. In order to overcome this barrier, they took a collaborative approach and engaged with government, regulators, and the community. The result was the development of an Independent Electricity System Operator (IESO) run pilot project exploring how energy storage can be integrated into the day-to-day operation of Ontario's electricity system and market.

¹ The Natural Gas Technologies Centre. "About Us." Retrieved from <http://www.ctgn.qc.ca/en/profile-eng/profile-engl>

² Fortis BC. (October 1, 2012) "FortisBC to deliver thermal energy to schools within Delta School District." FortisBC News Release. Retrieved from <http://www.fortisbc.com/MediaCentre/NewsReleases/2012/Documents/DeltaSD%20Media%20Release.pdf>

³ Government of Ontario. Ministry of Energy. (December 15, 2014) "Smart Grid Future." Retrieved from <http://www.energy.gov.on.ca/en/smart-grid-fund/>

⁴ CCEMC. "About". Retrieved from <http://ccec.ca/about/>

3. Strengthen Support for Innovation through Coordination of Federal/Provincial/Territorial Tools and Processes

Some of the most impactful innovations are occurring at the local level. Provincial and territorial governments were advised to harness the capacity of communities to advance innovation, and the federal government to examine opportunities to export not only local technical solutions but also services and expertise. For instance, there are now over 170 community energy plans in place across Canada, representing nearly 50 percent of the Canadian population. These plans help to define priorities for communities, utilities, and regional energy planners with a view to improving efficiency, facilitating infrastructure siting, cutting emissions, and driving economic development.

It was also suggested that there is a need to coordinate and align federal, provincial, and territorial administrative processes for energy technology innovation funding programs. For instance, rate-based levies or feed-in-tariffs could be used to leverage established national innovation programs and funds, such as Natural Resources Canada's ecoENERGY Innovation initiative and Sustainable Development Technology Canada's (SDTC) SD Tech Fund. Alignment of application processes between established funding organizations at both the national and provincial/territorial levels would minimize applicant hurdles.

Innovation in Action

- Ontario's Municipal Energy Plan (MEP) Program is an example of coordination of innovation funding at the local level. The MEP programs enables municipalities to better understand their local energy needs, identify opportunities for energy efficiency and clean energy, and contributes to advancing local energy development through innovation.⁵
- The Community Energy Plan for the City of Guelph led to the establishment of a new business model for integrating energy service delivery and management systems, including solar and combined heat and power, as well as attracting international manufactures for solar and wind products to locate in the community.
- Innovation funding organizations, such as Sustainable Development Technology Canada (SDTC), have the capacity to leverage different innovation funding sources and to partner with industry to advance innovation.

4. Policy, Regulation, Programs, and Technology Need to Support One Other

Leadership and collaboration between government, regulators, regulated and competitive energy providers, and other organizations from across Canada are critical in establishing the conditions for successful integration of new technologies into traditional energy infrastructure (electricity, gas, and thermal energy) and the development of future technologies. Working in siloes will not turn innovative ideas into reality. Developing the right policy, programs, and regulatory environments to support innovation together is key.

Innovation in Action

- The Local Energy Efficiency Partnerships (LEEP) tool for homebuilders, administered by Natural Resources Canada, helps accelerate the commercial adoption of the best available technologies. This program supports builders to reduce risk and save time by identifying the best energy efficiency innovations and products for specific regions in Canada.⁶
- In Nova Scotia, direction was provided by the provincial government to reduce the provinces' reliance on coal-fired generation and to incorporate cleaner sources of electricity, such as hydro, tidal, wind, and natural gas. This shift required innovative policies, new regulatory frameworks, more community engagement, and industrial development. As a result, there is closer collaboration on the development of new or amended legislation and regulation than there was ten years ago to support innovation in Nova Scotia.
- The redevelopment of the Chaudière Islands in the Ottawa River between Gatineau and Ottawa is an example of successful intergovernmental coordination on an innovative micro-grid project. Approvals were successfully moved forward by the City of Ottawa, the City of Gatineau, the Province of Ontario, the Province of Quebec, and the National Capital Commission for the development of zero carbon, zero waste condos on the island.

⁵ Government of Ontario, Ministry of Energy. (June 2, 2015) "Ontario's Municipal Energy Plan Program." Retrieved from <http://www.energy.gov.on.ca/en/municipal-energy/>

⁶ Government of Canada, Natural Resources Canada. (April 5, 2015) "Local Energy Efficiency Partnership (LEEP)." Retrieved from <https://www.nrcan.gc.ca/energy/efficiency/housing/leep/17338>

5. Keep the Consumer as the Focus

Energy delivery and management is changing as the focus becomes more local and responds to the needs of communities and consumers. There is a need to be more open to new ways to keep the demand perspective central to policy and program development for technological innovation. For instance, barriers remain to accessing energy data, which can enhance the value for communities and consumers as well as support innovation. A provincial or even national standard is likely necessary to improve data access, integrity, and usefulness.

Innovation in Action

- Data sharing programs like the Green Button Program in Ontario provide energy users with access to smart meter data and the ability to share that data with innovative applications, products, services, and solutions. This can help households and businesses conserve energy and better manage their electricity bills.
- In Nova Scotia, the Halifax Solar City Program offers homeowners innovative solar energy options which can be financed through a solar collector account with the Halifax Regional Municipality in Nova Scotia.⁷ With over 60% of homeowners adopting a live internet based monitoring system, there is an unprecedented amount of data being collected. The data isn't only helpful to homeowners, but will help the municipality calibrate the success of the program and inform future decisions.

6. Respond to Market Opportunities

Most of the technological innovation taking place in Canada for energy delivery and management will likely be applied in urban environments and offers a competitive advantage for Canada alongside traditional energy exports. Specifically, advances in energy management and delivery, such as the Smart Energy Networks⁸ concept, are likely to be transferable to communities anywhere in the world. It would be beneficial to include local solutions (storage, distribution, IT, energy management etc.) in the development of any strategic energy export framework.

Innovation in Action

- GE Grid IQ™ Global Innovation Centre in Markham, Ontario, “is designed to foster innovation and global collaboration to improve the efficiency, reliability and security of the world’s electrical grids.”⁹ The Global Innovation Centre also focuses on innovation at the local level and is currently demonstrating micro-grid applications with local utility PowerStream in Vaughan, Ontario.¹⁰ These advancements are already moving to international markets through GE’s international operations.

⁷ City of Halifax. (April 28, 2015) “What is Solar City?” Retrieved from <https://www.halifax.ca/solarcity/>

⁸ Smart Energy Networks embody the rapidly changing advancements in energy delivery to end users by using advanced information, communication and storage technologies to monitor, manage, and integrate the delivery of energy from multiple fuel sources. A key attribute of a Smart Energy Network is the use of advanced technological systems and data from different sources to make better energy management decisions.

⁹ GE. “Grid IQ Global Innovation Centre.” Retrieved from <https://www.gedigitalenergy.com/GridIQ.htm>

¹⁰ GE. “News and Events.” (April 2, 2014) “GE and PowerStream Launch Ontario Micro-grid Demonstration Project to Help Address Growing Demand for Electricity.” Retrieved from https://www.gedigitalenergy.com/press/gepress/gimcs_powerstream.htm

PATHWAYS TO INNOVATION: THREE CONSIDERATIONS FOR MINISTERS

The Symposium was developed with the purpose of bringing leaders from government, industry, and other organizations to develop considerations for Ministers at the 2015 Energy and Mines Ministers' Conference.

From the Symposium three clear considerations emerged, including:

1. Coordinate and align priorities for energy management and delivery to enable more effective collaboration among provinces, the federal government, and industry on:

- Technology innovation in electricity, natural gas, thermal energy, and storage
- Community energy planning and distributed and integrated energy systems
- Simplify administrative processes for innovation program funding (e.g., application processes)

2. Support new approaches to funding innovation that address local priorities (e.g., utility based innovation levies or feed-in-tariffs and funds from provincial carbon pricing regimes)

3. Identify opportunities to globally market local-level technology advances for energy delivery and management

To learn more about the *National Policy Symposium Energy Delivery and Management: Pathways to Innovation* visit us at <http://www.questcanada.org/preEMMC>



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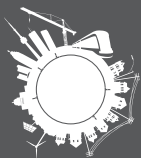
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