WORKSHOP REPORT

Perspectives on Transition of the Distribution Grid

by Dane Labonte* and Ian H. Rowlands#

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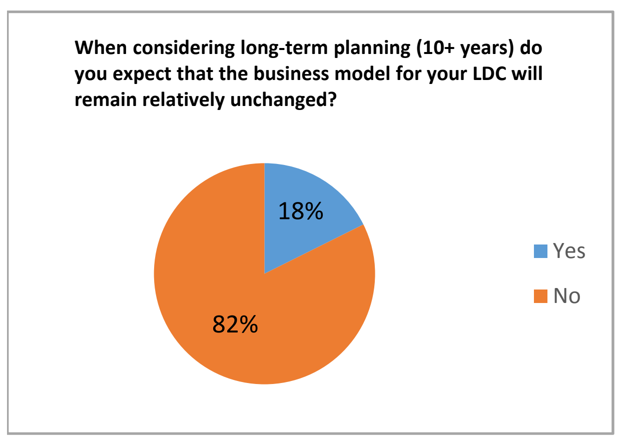
The Ontario electricity sector is continuing to evolve. The development of more economically viable smart grid technologies is hinting at a potential shift in how the electricity system is designed and managed. On 20 November 2015, a half-day leadership workshop was held in Cambridge, Ontario to discuss the future of local distribution companies (LDCs) in a transitioning sector. The workshop was organized by researchers at the University of Waterloo and made possible through the support of a research grant from the Social Sciences and Humanities Research Council of Canada (SSHRC). The majority of the participants in the workshop were board members or senior management representatives from four local LDCs: Cambridge and North Dumfries Hydro, Guelph Hydro, Kitchener-Wilmot Hydro and Waterloo North Hydro. There were also representatives from the Independent Electricity System Operator (IESO), Natural Resources Canada, the Ontario Energy Board and the University of Waterloo. In total, 45 individuals participated. The purpose was to bring stakeholders together to consider how future trends may be expected to impact the continuing evolution of the electricity sector in general and Ontario LDCs in particular.

Above: Keynote speaker Paul Murphy (MaRS)

A pre-workshop survey was shared with the leadership teams from the four LDCs. Board members and senior management were directed to a web-based questionnaire and invited to respond to a variety of questions aimed at better understanding how they were planning for the future. The survey covered questions related to strategic planning, factors influencing the future of the distribution sector and technologies that could impact the sector. Seventeen individuals participated in the survey. Each of the four LDCs was represented in the responses, and both board members and managers (across a variety of departments) responded. While the responses should not be considered representative of the sector, nor of the LDCs involved, they provided some background to begin the conversation. Figures 1-4 present responses to some of the questions.

Figure 1 – Survey respondents' views on the changing business model (n=17)



Paul Murphy, Chair of the MaRS Advanced Energy Centre, and former President of the IESO, was the workshop's keynote speaker. His presentation built upon research conducted with the Centre for Urban Energy at Ryerson University.[1] He provided an overview of the changing context for the LDC sector: investment is needed to replace old infrastructure, distributed energy resources are becoming more economical, customer needs and expectations are changing, severe weather will require system strengthening, capital will be limited to address these changes and government involvement will continue in the sector. He closed the presentation with ten strategic questions for the audience to consider as they plan for the future (see Text Box 1).

Figure 2 – Survey respondents' views on strategic planning timeframes (n=17)

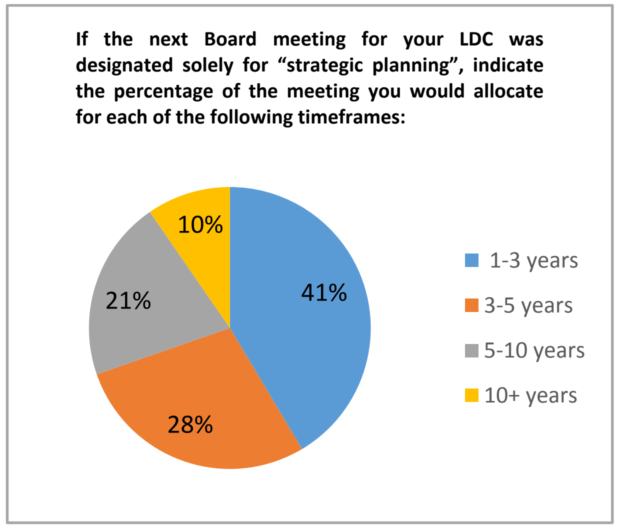
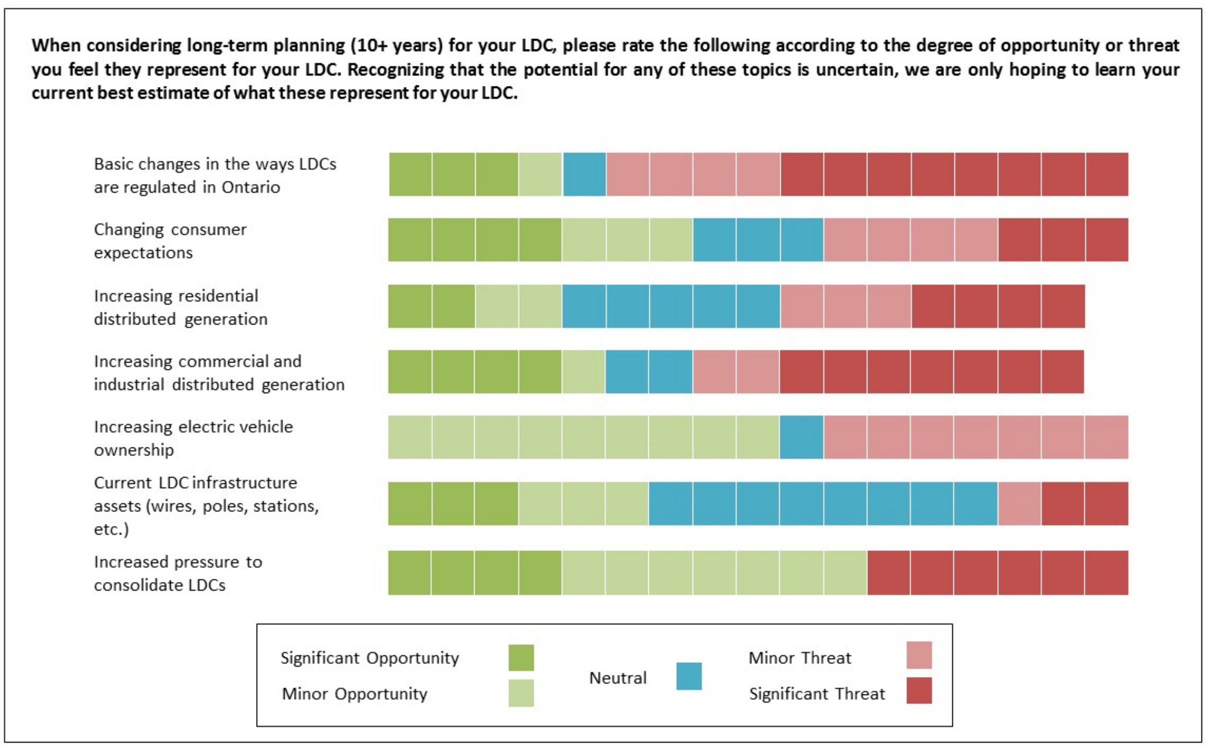
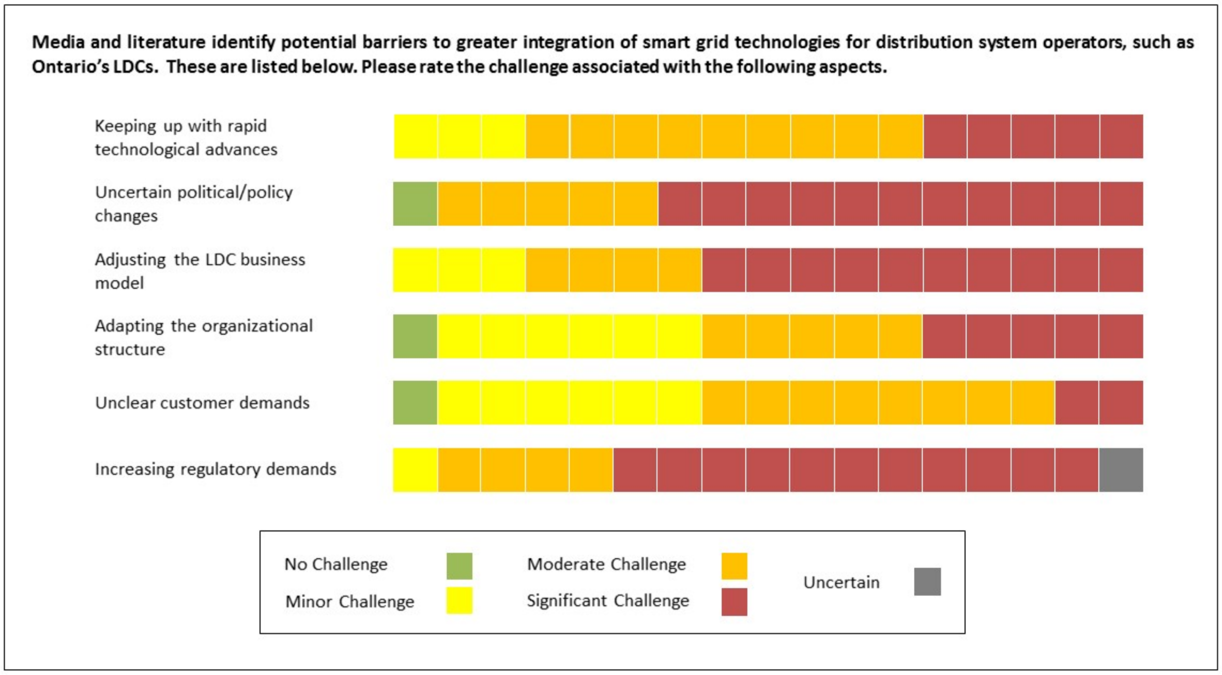


Figure 3 – Respondents' perceptions on long-term planning's threats and opportunities (n=16 or 17)



[1] Paul Murphy, Ryan Zade, Sean Conway and Bala Venkatesh, LDC Asset Renewal Series: Executive Summary (Toronto, ON: Centre for Urban Energy, Ryerson University, http://www.ryerson.ca/content/dam/cue/pdfs/0.%20Final_Summary.pdf, 1 December 2014).

Figure 4 – Respondents' perceptions of the challenges associated with barriers (n=17)



Participants were invited – anonymously at the beginning of the coffee break after Murphy's presentation – to provide immediate reactions, responding to the question, 'What are the two biggest takeaways from Paul Murphy's presentation?' Many participants referred to the changing customer relationship in the future: 'The industry will become more customer driven', was an indicative response. The ten strategic questions that closed Murphy's presentation were also referenced by many participants: '10 strategic questions are excellent discussion guide for LDC planning', wrote one participant.

Above: Rene Gatien (Waterloo North Hydro, right) puts a question to Paul Murphy (MaRS, left); Ian Rowlands moderates (UW, centre).

The final component of the workshop was a panel discussion

Text Box 1 - Ten strategic questions every distributor should be asking

1. Should we continue to invest in traditional distribution equipment solutions for sustainment and development or should we invest in alternatives to traditional distribution solutions (such as distributed energy, smart grid, storage, etc.) to meet system and customer needs?

2. Should we count on the regulator to protect our return on investment in the face of lower revenues from regulated assets or should we invest in the businesses that lead to the lower revenues?

3. Should we aim to provide all customers with similar reliability or should we segment, serve and charge customers according to their reliability needs or value?

4. Should we continue to plan for the grid as the primary supplier of reliability or should we anticipate and plan for a future grid where local supply is the primary source of reliability and the grid serves as its backup?

5. Should we invest only shareholder (public) money in infrastructure or should we augment it with private investment in infrastructure?

6. Should we harden distribution assets to improve resilience against weather and other hazards or should customers pursue local generation/storage resources to improve their specific resilience?

7. Should we implement only technology proven through extensive application or should we actively promote new technology testing and deployment?

8. Should we rely on the traditional regulatory system to keep pace with sector change or should we work with the Board on a more flexible regulatory approach?

9. Should we rely on government alone to provide sound policy leadership or should we invest (individually or collectively) in an informed exchange with policy makers?

10. Should we reactively integrate new technology into our traditional systems or should we plan and build the future system around the new technologies?

with representatives from each of the four LDCs. The discussion built on the keynote presentation and covered a range of questions – some offered by the moderator and others volunteered by audience members. Key points raised included:

- The need to continue updating infrastructure (a process that has been happening for some time) while continuing to balance investment and cost-pressures.
- Customers are focused primarily on keeping costs low, but LDCs control only a minor portion of those costs. There is a need to determine what services customers want, and how much they are willing to pay for those services.
- The changing landscape is driving exploration of opportunities for the non-regulated side of LDC businesses, notably behind-the-meter technology and combined heat and power projects.
- The trends in the sector are creating greater uncertainty moving forward. This may require LDC planning to become more adaptable.
- The Region of Waterloo Community Energy Investment Strategy was highlighted as an effective strategy to identify achievable projects through data mapping and collaboration.
- There are opportunities for collaboration: between LDCs to share information, with natural gas utilities, and with private business.

When providing feedback at the coffee break, participants were also asked the following question: ‘Briefly, what do you think are one or two items that LDCs should do in the near-term to position themselves to succeed in a changing sector?’ In total, 25 participants gave responses; with each of these individual participants offering either one, two, three or four items, there were 43 items in total. These were reviewed, coded into particular themes and summarised. The table below presents the results. Reading any individual row, it indicates the number of items in which a particular theme was raised, and also notes whether that same item had a secondary theme associated with it as well. For instance, consider the row entitled ‘Business Model’: 11 of the 43 items had its primary theme identified as ‘Business Model’; of those, four had a secondary theme identified relating to ‘Customer’, two had a secondary theme identified relating to ‘Technology’, and a further five had no secondary theme. (Further details about the themes can be found in Appendix A, at the end of this report.)

Left to right (above): Panellists Kazi Marouf (Guelph Hydro), Ian Miles (Cambridge and North Dumfries Hydro), Jerry Van Ooteghem (Kitchener-Wilmot Hydro), Glen Wright (Waterloo North Hydro).

Themes	Primary category	Secondary category						
		Business Model	Customer	HR	Learning	Partnership	Regulation	Technology
Business Model	**11**		4					2
Customer	**10**							
Human Resources	**1**							
Learning	**2**							
Partnership	**3**							3
Regulation	**6**					3		
Technology	**10**	1				3		

The Perspectives on Transition of the Distribution Grid workshop provided an opportunity for board members and management team representatives from local LDCs to share thoughts on how their sector may be changing. A diversity of ideas and issues were raised, suggesting that this is a fruitful area for further inquiry. Given the day’s discussion, it is clear that LDCs have begun to strategize in anticipation of changes ahead and that many different possibilities, predictions and preferences exist.

Left to right (above): Dane Labonte (University of Waterloo), Ian Rowlands (University of Waterloo), Paul Murphy (MaRS), Jerry Van Ooteghem (Kitchener-Wilmot Hydro), Ian Miles (Cambridge and North Dumfries Hydro), Kazi Marouf (Guelph Hydro), Glen Wright (Waterloo North Hydro), Rene Gatien (Waterloo North Hydro).

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Appendix A – Respondent Theme Details: Briefly, what do you think are one or two items that LDCs should do in the near-term to position themselves to succeed in a changing sector?

Category	Samples of themes advanced by respondents
Business Model	• Diversify offering and identify new revenue sources • Seek private investment • Maintain business efficiency
Customer	• Pilot new customer options (secondary category: business model) • Investigate customer segmentation (secondary category: business model) • Research customer wants and needs
Human Resources	• Train and hire to meet changing needs
Learning	• LDC collaboration • Learn from other jurisdictions
Partnership	• Identify technological partnership opportunities (secondary category: technology • Seek private sector partnerships for emerging technology (secondary category: technology)
Regulation	• Engage policy makers • Create a unified policy voice (secondary category: partnership)
Technology	• Invest in technological research and development • Upgrade assets • Accommodate local distributed generation