

US Department of Commerce Grid Week

Laura Formusa - Keynote

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Check against delivery.

I wanted to thank the Department of Commerce for inviting me to speak at this forum. I'm very excited to take part in this vital conversation. I hope that the story I have to tell you about the Ontario experience is of value to you and informs the conversations you have in the days ahead.

Hydro One has recently been conducting face to face customer research around opinions and attitudes on electricity issues, and it's clear our customers have one overarching question about the smart grid:

"What's in it for me?"

Our customers are most certainly not looking for new ways to increase their electricity bills.

All investments we make in the system are under tremendous scrutiny. And, with the current

economic conditions, rate increase fatigue is a serious issue.

I believe there is tremendous value in the development of the smart grid for our customers, but I also believe as an industry we lack what the grid's original builders had in spades: a simple and compelling narrative.

So that is my challenge to all of us - we must create that narrative if we are to be truly successful in delivering the value of a smart grid.

But I am getting ahead of myself. I would first like to introduce you to our Company for those who might not know us.

Hydro One is the Province of Ontario's largest transmitter of electricity, operating about 20,000 miles of high voltage lines. We are also the

province's largest distributor of electricity, serving close to 1.3 million customers through about 80,000 miles of distribution lines over a rural service territory of about 247,000 square miles—a land mass about twice the size of Texas with roughly half of the population.

Hydro One's high voltage transmission system, like others around the world, is smart, highly automated, and controlled centrally by our state-of-art grid control centre. Our distribution system on the other hand, like most large rural distribution systems, is dumb—built on an electromechanical foundation that is over 100 years old. We have no view of the health of the distribution network unless we are standing on the side of the road looking at it. We operate it manually for the most part, and rely on customers to tell us when the power is off.

Which they do. Over and over again, especially after the storms we've experienced this year.

But a fundamental paradigm shift has begun. As a society, the way we produce, distribute, and consume electricity is changing. Nowhere is this statement truer than in the Province of Ontario.

This paradigm shift is part of a global trend that Ontario is leading—and sometimes propelled by.

I want to speak to you today about three things:

- the policy environment in Ontario that has put Hydro One's system at the forefront of distribution modernization;
- the work we've accomplished in six short years and the opportunities we still seek to address
- and the one thing we desperately need that the power system visionaries of the 20th Century had on their side: a simple story on the value proposition.

Ontario Leadership

So first to the policy environment in Ontario:

Ontario's Long Term Energy Plan, together with its landmark Green Energy and Green Economy Act, have identified three main areas of smart grid focus:

- Helping consumers become more active participants in conservation;
- Connecting new and renewable sources of energy to the overall system; and
- Creating a flexible, adaptive grid that can accommodate the use of emerging and innovative energy-saving technologies and control systems.

The provincial government is decisively moving Ontario from a dependency on coal to a cleaner, modern, and reliable energy economy that creates jobs. Coal is scheduled to be phased out completely by 2014.

Increasingly in Ontario, electricity customers are no longer just consumers of electricity, they are generators of green energy—largely a result of North America’s first comprehensive Feed in Tariff program. This program was designed to encourage individuals and companies to develop renewable energy projects.

The encouragement worked!

In about two short years, homeowners, farmers and small businesses have submitted close to 26,000 “micro-scale” (10 kW or less) renewable applications to the Province. Those applications continue to pour in at a rate of 500 per month. The vast majority of these applications are in our service territory, with the balance being in territories served by urban distributors.

Hydro One has processed more than 17,000 applications and offered connections to almost

10,000 projects. To date, we have connected almost 6,000 micro-scale generators to our distribution system.

Ontario is now Canada's leading province for wind and solar capacity and home to Canada's four largest wind and solar farms. In 2003, Ontario had 10 wind turbines; today the province has more than 900.

Since October 2003, Ontario has signed more than 16,000 renewable energy supply contracts for almost 2,400 MW of small and large renewable power. This represents a private sector investment of \$9B and is projected to create about 50,000 direct and indirect modern energy jobs.

All of this has been enabled by policy and regulation that have set the course for grid renewal and transformation.

Hydro One Successes

So, what has Ontario's largest transmission and distribution utility achieved in this context?

Smart Meters and Time-of-Use Pricing

Ontario's leadership in smart meters represents an essential first step in realizing the benefits of a smart grid for consumers.

I am proud to say that almost all of Hydro One's 1.3 million residential and small business customers now have a smart meter. Over the past year, just over 1.05M of those customers have been transitioned to Time-of-Use prices.

Unlike some jurisdictions that have hit road blocks in their smart meter implementations, the Hydro One team has succeeded. I say team because it wouldn't have been possible without our partners who have delivered excellence and innovation.

It also wouldn't have been possible without creating and maintaining a dialogue with our customers. We explained to them what was coming, how to manage the transition and closely managed issues as they arose.

We achieved this success on schedule and on budget. An accomplishment, I'm proud to say, being recognized later this month in Washington by Utilimetrics with its Excellence Award for AMI Deployment, and only made possible with the strong support of our project partners, Trilliant and Cap Gemini.

Customers now have access to their hourly electricity consumption as soon as the day after they use it. This encourages customers to shift consumption to take advantage of lower off-peak prices and will lead to more efficient use of existing grid infrastructure and generation assets.

Smart Grid Privacy

And at least part of our success on smart metering has been about getting out in front of the challenges before they become significant public issues—issues like privacy of information.

The smart grid, on one level, is all about collecting, transmitting, sharing, analyzing, and acting on information never before available that will ultimately increase the value of electricity to consumers. But for some customers, this sparks fear of identity theft and the eyes of Big Brother.

Working in partnership with Ontario's Information and Privacy Commissioner, Hydro One has done some groundbreaking work showing the way forward for utilities working to embed privacy into the emerging smart grid, demonstrating how the principles of Privacy by Design—the gold standard for privacy—can be baked into smart grid technologies and infrastructure right from the start. By designing our system to separate

personal information from energy information, we avoid putting consumers at risk.

ADS Project/Connecting Renewable Generation

Building on our smart meter success, we are continuing to move forward with our Advanced Distribution System Project. This Project marks an historic first step in modernizing our distribution system and realizing our vision of a smart grid—a grid that will enable the safe and reliable operation of renewable generation currently being built across the province, enhance system reliability, make available data that will keep rates as low as possible in the future—and ultimately transform our relationships with customers.

Together with our private sector partners GE, IBM, and Telvent, we have marshaled some of the best thought leaders in the industry to analyze, identify, and deploy applications, equipment, and

processes in support of optimizing the connection of distributed generators into Hydro One's rural distribution system, improving reliability and operations, and optimizing outage restoration and network asset planning.

What we learn from this pilot initiative will provide the foundation for building our vision of a modern distribution system with new levels of automation, enhanced communication capabilities, and a much more data rich environment for our Operators and Planners to better serve our customers.

Communications Infrastructure

As we certainly learned during our smart meter installation, telecommunications are at the core of a smarter grid, bringing the data generated by meters, sensors controllers, and a host of other devices on the grid to systems that turn the data into actionable information. I am proud to say that we have been breaking new ground in this area as well.

Working with Utility partners across Canada, Hydro One was instrumental in successfully securing dedicated wireless spectrum for critical electricity infrastructure from Canada's Federal Telecommunications Regulator—a world first, I believe. And critically, we secured this spectrum at a rate that we, and our consumers, could afford.

And we were extremely pleased when this achievement was recently acknowledged by the Utilities Telecom Council through its Apex Award recognizing special instances of how utilities have used their expertise to demonstrate excellence, innovation, and service to the communities they serve.

Challenges

While we have had many early successes in Ontario, there are challenges still to be overcome.

Connecting Renewable Generation

Distributed energy resources offer many potential advantages to the electricity system. They are small scale, they can be located close to load, they can be built quickly, and many use clean renewable technologies.

The challenge lies in using these resources effectively and connecting them to a “skinny” distribution system that historically has been designed and operated to deliver electricity safely to consumers—not carry energy generated by thousands of different sites.

The good news is we are building the tools and processes to optimize distributed generation connections utilizing advanced metering infrastructure (AMI).

Standards

Standards are a challenge for jurisdictions like Ontario who are taking an early lead on smart grid development. We risk making large infrastructure investments before standards have sufficiently matured.

The challenge of interoperability, enabling new and existing technologies to exchange information and work together is substantial.

Open, broadly accepted standards will encourage third-party innovation, promote competition, give confidence to investors, and will lead to more affordable, reliable, and interoperable products for consumers – that compelling story they are waiting for.

Culture Shift

The human element of this transition is to my mind our greatest challenge.

This need for change isn't just systems, structures and processes. It's culture, the culture of consumers and the culture of the companies that serve them.

For most of my career, we have focused on the operation and maintenance of a mature system. That focus brought with it a culture of control, order and security, a utility culture, if you will. That culture is being pushed by a need for innovation, collaboration and vision, which all have to be grounded in the prudence that defines our sector.

Shifting consumer culture is an even mightier challenge. Those same customers we spoke to in our focus groups described electricity as "essential" "necessary" and "for everyone." They also described it as "expensive" and saw little value in innovation.

With new information, our customers are moving from unaware and passive consumers to aware and active...and this move is being accompanied by rising electricity costs, due in part to aging infrastructure, against a backdrop of economic difficulty.

Consumers want assurances they can safely connect their rooftop solar panels to the distribution system. They want more control over their increasing energy bills or want no increases at all. They want to make sure they can enjoy the features and benefits that will come with a smarter electricity distribution system. They also want the reliability they have come to expect to be maintained.

The customer of yesterday consumed a product and paid a bill.

That customer is now being joined by customers of today and tomorrow who generate their own

electricity, monitor their consumption and production on an hourly basis and expects to be an engaged partner in a two-way relationship.

The industry as a whole (utilities, governments, regulators, and the private sector) needs to take the lead in educating millions of consumers and helping them navigate this transition. We ignore them at our peril.

Smart grid technologies need to be marketed for their customer value as well as their contribution to operational efficiency....and they need to be demonstrated to all customer and stakeholder segments.

Many utilities, particularly in the US, have recognized the need for consumer education through education campaigns including mobile experience centres, pilots and demonstration homes....but we all need to do more.

I am pleased to announce today that our partners GE, IBM and Telvent have agreed to join us in planning, designing, and building a state-of-the-art smart grid consumer education centre. This will allow us to stop telling and start showing our 1.3 million customers the future.

Conclusion

I have covered a lot of ground this morning and would like to conclude by saying that the smart grid is not an end in itself. Unlike the grid visionaries of the last century, we are yet to see a simple story emerge. I see this as more of a long journey with many conversations with customers along the way.

There is no magic moment when we will know that the smart grid has arrived. It will be developed over a long timeline to meet the unique needs of the consumers, businesses, and industries it serves.

What the smart grid does represent is a dramatically new phase of development for the electricity system. A phase that demands us to model ourselves after the visionaries of the 20th Century Grid: the work we do in the next decade must bring benefits, both environmental and economic to our customers for the next 100 years.

But to make that happen, we have to define where we're going and work together to get there. As the old proverb says, if you want to travel quickly, go alone. But if you want to travel a great distance, you better go as a group. We have many miles to go and I look forward to continuing our journey together.

Thank you.