

CAC Manitoba: Book of Documents
NFAT Review

Tab	Document
1	Bruce Campbell, <i>Notes for Remarks: Ontario Energy Network Luncheon</i> , January 8, 2014

TAB 1



Notes for Remarks
Ontario Energy Network Luncheon

Bruce Campbell
President and CEO
Independent Electricity System Operator

January 8, 2014

Check Against Delivery

Thanks very much. Let me start by sharing how delighted I am to be carrying on this new year tradition at the Ontario Energy Network.

I want to echo the earlier congratulations for the local distribution company community and our appreciation for a job well done. I spent the holidays at our family farm north of Cobourg – we were out for over 48 hours – not long compared to many – but even so I can't tell you how happy our family was when the hydro came back on.

Throughout the recovery I also participated in the usually twice a day conference calls organized by the Minister – and while there wasn't much to report at the provincial grid level, the co-operation, sharing of information, welcoming of suggestions and co-ordination amongst the affected LDCs, the ESA – and the various ministries - was everything you could have wished for, and more.

The focus was on doing everything they could to ensure that the right resources were in the right places to get power restored as quickly as possible. This was a demonstration of very impressive leadership in very tough circumstances.

It's pretty clear that 2013 will be remembered for the significant impacts that weather had on our electricity system, particularly on the Toronto Hydro and Hydro One systems; first in July with the worst ever flood in 50 years, and then an ice storm that rivalled the 1998 storm.

Let's hope nature gives the LDCs a break this year -- they deserve it.

There are a few other people in the audience I would like to recognize; our Board of Directors, our Chair Tim O'Neill, our Vice-Chair Rudy Riedl, Angela Ferrante, Helen Polatajko and our newest Board member Margaret Kelch.

I would also like to single out one particular member of our Senior Management Team who is with us today, and that is Bill Limbrick. After more than a decade with the IESO, Bill has decided to retire at the end of February.

Prior to joining us as Vice-President, Information Technology and Infrastructure, Bill worked with the IESO to open the market in 2002. He's also had responsibility for Human Resources and led the IESO's Smart Meter project. With our dependence on information technology, we've all benefited greatly from Bill's vision and leadership. Please join me in thanking Bill and wishing him well.

The turning of the year is often a time to take stock. I think of this in three ways: first, to look back at what we've learned; second, to determine how to apply those lessons going forward; and third, to check the horizon for potential surprises.

And that in a nutshell is what I am going to try to do today – touch on the past and present, and then speculate on the possible futures for the sector.

Looking to the past, I'll start with an anniversary. For the electricity sector, 2014 represents the 25th anniversary of Ontario Hydro's 25-year Demand Supply Plan. So in preparing for these remarks, I pulled out my copy of the 25-year plan to reacquaint myself with how Ontario Hydro thought 2014 would unfold.

The forecast might surprise you.

The primary load forecast – after allowing for conservation, demand management programs and load displacement NUGs – projected a peak demand of about 35,000 MW in 2014, but also suggested the utility should be prepared to meet a peak primary demand closer to 40,000 MW. Last year's peak: just under 25,000 MW.

In terms of energy, the median primary energy demand was projected at 214 terawatt hours, a far cry from last year's 141 terawatt hours.

To supply that energy, after allowing for 5,000 MW of demand management, and on top of a refurbished coal fleet, Ontario Hydro was projecting a need for 12 new nuclear units and about 7,000 MW of natural gas generation, of which 2,000 MW would be non-utility generation.

None of the options included any wind or solar. And yet wind supplied 3.4 per cent of Ontario's energy needs in 2013 – with a lot more to come.

The situation today looks a lot different than it did 25 years ago.

My point is not to critique anyone's long-term planning. It is simply to demonstrate that if we had locked ourselves into 25-year commitments, we would have found ourselves with a number of challenges on our hands. Circumstances can be surprisingly different from what we anticipate when preparing a long-term plan.

Many would argue that the uncertainty we face over the next 25 years is likely to be even greater than what we've actually experienced since 1989. So how do we handle that change as it unfolds?

From our perspective, that of an operator, the tool we are always looking for is flexibility.

One lesson we've learned is that as we invest in the power system, there needs to be a very clear expectation that the operating circumstances faced by long-life assets will not be static, and appropriate flexibility needs to be woven firmly into the contract commitments made to support those assets. We need that flexibility if we are to respond efficiently to the inevitability of change.

That's our major lesson from the past, including the recent past. I'll come back to how we hope to provide some of that flexibility, but first let me take a small diversion and describe where we are today.

We begin 2014 in a good position from a supply perspective. Long gone are those days of a decade ago when we leaned heavily on our neighbours to meet demand in Ontario during those hot, humid summer days.

And the supply mix that we have in place today is also much cleaner and depends less on carbon-producing fuels.

All of the coal units have been taken out of service, except for Thunder Bay, which will have very limited use prior to being taken entirely off coal by the end of the year. To replace that coal, gas-fired generation has been introduced as a major fuel type, and six refurbished nuclear units have been brought back on line

We also start the year with just over 2000 MW of transmission-connected wind resources with about another 3000 MW of wind expected over the next 18 months.

Embedded in the local distribution system are more than 900 MW of solar generation, a number that will continue to grow. We are also looking at connecting two major solar projects to the transmission grid over the next 18 months.

The successful integration of wind and solar into our system has occurred thanks to a lot of hard work from a number of participants, including many in this room. Thanks to those efforts, we are now in a position where we can reliably forecast how much of that wind and solar will be available and its impact on our operations.

And last September, having worked with renewable generators, the OPA and other stakeholders, we introduced dispatch of renewables into our tools. We can now treat grid connected wind and solar like the mainline resources they have become.

Overall, our increased supply capability, coupled with flat or lower demands for electricity, has resulted in a positive demand-supply outlook that is expected to continue for the next few years. That outlook offers us an opportunity; an opportunity to take some time to invest in developments that will enhance the flexibility and resiliency of the system, and of our markets, as we move forward.

Looking forward, the Long Term Energy Plan sets the stage for electricity planning and lays out roles and responsibilities for a number of entities.

Flexibility is a key principle of the LTEP; flexibility to meet any change in the demand forecast, and flexibility to address the variability of a power system heavily invested in wind and solar resources.

Three specific recommendations in the LTEP will help provide that needed flexibility. They are demand response, storage, and capacity markets, and I want to expand on each of these areas.

The IESO has long been an advocate for demand response. We believe there are opportunities for increased participation from the demand side in Ontario's electricity market. In doing so, customers not only help meet system needs but also help manage some of the cost pressures they are facing.

Other jurisdictions have been successful at integrating significant amounts of demand response into their markets. In New England, about 3600 MW of demand response has been procured in their capacity market, or about 10 per cent of total procured capacity. Similar potential exists in Ontario

and given our broadened role in demand response, we intend to realize that potential.

Almost 5,000,000 smart meters have been installed across Ontario allowing residential customers to access time-of-use pricing. Those time-of-use rates, along with other demand response programs, such as PeakSaver, DR3, and the Global Adjustment Allocation, are enabling customers to help meet system needs and better manage their bills.

These existing programs led to over 1,000 MW of reduction on peak days last summer.

We've been meeting with aggregators and loads to determine what changes to the existing DR3 program can help realize that demand response potential.

And with our interest in markets, it should come as no surprise that we want to move demand response into the market. We are working with the demand response community to remove unnecessary barriers to their participation in the wholesale market, and in doing so we can help them develop new, efficient, load management services

These efforts will help us to better understand the capabilities of different demand response technologies, and to design specific participant categories and compensation mechanisms

In looking at demand response we will also be looking to partner with the LDC community – and perhaps to test the notion that the main opportunity for demand response lies with the commercial and industrial sectors. As a commentator in the January 2nd issue of Smart Grid News pointed out, “RDR (Residential Demand Response) is being recognized as an environmentally friendly and effective way to put flexibility back into the power system.”

As I mentioned, storage is another solution that offers flexibility to help manage the reliability of the grid. The LTEP makes a commitment to bring on 50 MW of storage.

Building on our recent projects with regulation services, the IESO and OPA are working with the storage community to provide the Minister with a framework for procuring energy storage. This effort is already underway and we expect to have something for the Minister within a few weeks.

But in addition to the various emerging technologies, I believe we also need to look at additional mechanisms for procuring new resources; mechanisms that balance risks and rewards, promote competitive pricing and provide the flexibility needed to allow asset operation to evolve over time to match changing demands on the system.

It's a good time to look at alternatives. The situation of a decade ago presented some significant reliability risks, but those risks have been addressed by the contracting directives executed by the OPA.

That means we can now take the time to examine the most efficient ways of managing reliability without locking ourselves into long term contracts that may not provide the flexibility necessary to respond to an uncertain future.

And that leads to the third element from the LTEP that has the potential to contribute to flexibility – investigating a capacity market, where different generators and demand response compete to meet capacity needs.

A capacity market could complement long-term planning and procurement. And it can provide a cost-efficient mechanism for replacing contracts as they expire.

Other jurisdictions have had success with a capacity market. Part of that success has been to lower all-in consumer costs – for example PJM advises that its capacity market mechanism has helped drive down the all-in costs for PJM customers from 81 dollars per MWH in 2008 to 43 dollars per MWH in 2012.

Given the experience in PJM and other jurisdictions, it's worth seeing whether similar benefits could be captured for Ontario. In doing so, we need to recognize the unique characteristics of Ontario's electricity markets.

One of those characteristics is the contracts that exist in our market, and we are looking at establishing a working group to discuss the interplay between contracts and market design changes.

That's certainly one of the issues we want to address as we consider a made-in-Ontario capacity market – and we recognize that if we do move in that direction: it won't happen overnight, it will need a gradual introduction and it will need to respect and accommodate the contracts that already exist.

So as we move forward in 2014, be ready for us to be active in our new role for demand response, in storage, and in market development. Each of these means significant consultation and engagement with our participants and stakeholders.

Before looking out to a farther horizon, I'd like to take another short diversion this time to emphasize the value for the IESO of stakeholder engagement. It is an integral part of our fabric.

In particular, I'd like to recognize and thank all of you who make time to advise us, to debate with us, and to help us evolve the sector. The commitment you make to our various stakeholder engagements, to the

work of the Technical Panel, and to our Stakeholder Advisory Committee is very much appreciated across the company, especially by our senior management team and by our board.

Stakeholder Advisory Committee members have encouraged us to take a leadership position in identifying and implementing market improvements. We recognize that that leadership position has to be earned; it's earned through working with our stakeholders, welcoming your advice, and being transparent about how we have used that input.

Our promise to you is to live up to those principles.

And now – back to the future. At the same time we work to enhance both our current market and our operational capabilities, we are also maintaining an active interest in developments that could dramatically redefine relationships across the sector.

The IESO has supported and led the work of the Smart Grid Forum for about six years now. Having kept Paul on for many months beyond his retirement, I'm honoured to have been asked to take on the Chair as the Forum continues into 2014.

Over the course of discussions at the Forum, we have come to recognize that what we call smart grid could challenge the fundamental role of every segment of the electricity value chain from bulk generation, transmission, distribution, and ultimately, your home.

Consider just a few examples of the trends happening on the 'customer side' of the meter – developments that are already well underway. I'm going to list 4.

First, according to the Economist, in 1977 the average capital cost of solar PV panels was in the range of \$77 per watt of capacity. Today, several

variations of solar panels have brought this figure to well under \$1 per watt. Now that's just the panels, but several countries around the world have now reached the point where solar power provides a cheaper alternative to retail electricity rates without subsidies or feed-in floor prices of any kind. Here in Ontario, I'm told grid parity is in reach within a decade, and some would say sooner.

Second, the U.S. Department of Energy estimates that by the end of this decade the market for advanced batteries in the United States will have grown by 900 per cent. This growth brings economies-of-scale, which means cheaper energy storage options for electric vehicles, homes and businesses.

Third, there are already more devices connected to the internet than there are human beings on Earth. Even the most modest estimates peg that number to grow to 30 billion devices by the end of this decade. That's an average of over four connected devices for every person now on earth.

And fourth, the USB Alliance – those folks who brought you the USB plug for your computer – is upgrading its standards to allow USB cables to carry up to 100 watts of DC power.

So let's see now. Take those four points together: cheaper solar power, cheaper energy storage, more internet-connected devices, and low voltage DC power networks offering alternative ways to distribute your home-grown energy sources to devices in your home. Somehow this is all starting to feel like very fundamental change across our sector.

This is not to say the current electricity system is going to be completely displaced by these developments overnight, but we are going to see something very different from the previous 100 years of this industry's history.

Remember what they say about Alexander Graham Bell and Thomas Edison: Edison would recognize today's power system immediately, but Bell not so much on the phone side. Well, we may in fact be close to leaving Edison behind as well.

And we at the IESO are not immune to the technological change that is driving customer empowerment and growing electrical self-sufficiency.

Just a decade ago, using information technology to optimize electrical flows on the power grid was pretty much the exclusive domain of a small club of system operators. Today, technology is advancing both the need and the ability to do this optimization at the distribution system level, the microgrid level, the building site level, and even at home through the latest app on your smart phone.

As an industry, we all need to better understand how to optimize these investments across the entire electricity system, right from the bulk electricity system down to controlling electricity services in your house.

It is not enough to think of smart grid technologies from our individual perspectives. Something much bigger is taking shape – something that will truly connect the customer and the control room.

We're now moving toward a more fundamental debate regarding the roles of the various organizations in the sector – and maybe even the role of the electricity system itself.

In the coming months the IESO hopes to expand that dialogue with utilities and other potential new entrants into this space. We need to better understand what we're seeing on the horizon and assess the potential of distributed optimization, grid parity, microgrids, transactive energy and other technology-driven developments.

These developments won't wait for a time that's convenient for us, and one way or another they will affect our businesses. Exactly how may not be clear just yet, but for some this potential new world will be a made-to-order opportunity. At the IESO, we want to manage these changes, and not have them manage us.

In closing, let me do a brief recap.

First of all, there is no question that we continue to be in a strong reliability position. But all of our learning, from past initiatives like the Ontario Hydro demand-supply plan, and from our experience with variable renewable generation, reinforces the need for more flexibility as we move forward.

Second, the LTEP provides the planning framework for the sector and introduces a number of new mechanisms for us to integrate into our operations. This includes: an increased role for demand response, an increased role for storage, and consideration of a capacity market to support new resources.

And third, we need to be thinking about how the many disparate threads of emerging and maturing technologies may combine to dramatically reshape our sector.

It promises to be an exciting year for all of us – but please, we don't need any more flooding or ice storms.

I, and the whole team at the IESO, look forward to working with all of you to both meet the challenges of the new year and to realize the opportunities that are ahead of us.

Thanks very much for your time.