



Notes for Remarks:
GTA and Central Ontario (Vaughan) Regional Forum
December 11, 2017

Peter Gregg
President and Chief Executive Officer,
Independent Electricity System Operator (IESO)

Check Against Delivery

Thank you for that kind introduction.

I would like to begin by acknowledging that we're gathered today in the traditional territories of the Anishnawbek and Haudenosaunee peoples, notably the Mississaugas of the New Credit First Nation and Six Nations of the Grand River. I'd also like to note that the Vaughan area is covered by one of the Upper Canada treaties as well as the Nanfan Treaty of 1701. We thank all of the generations of people who have taken care of this land for thousands of years.

It is appropriate that we find ourselves today in Vaughan to talk about electricity planning. I say that because Vaughan was the fastest-growing municipality in Canada between 1996 and 2006. It achieved a population growth rate of more than 80 percent and has nearly doubled its population since 1991. It is the fifth largest city in the GTA and serves a perfect example of the importance of planning for growth in many areas, including providing for electricity needs.

To provide broader context into this, today's session will start with a focus on the transformation that's been happening in the provincial electricity system in recent years. As we move through the day, the conversation will become increasingly region-specific.

From an electricity-planning perspective, the GTA and Ontario's Central Region includes five separate planning regions and includes all of the Greater Toronto Area. It stretches north to Parry Sound/Muskoka and roughly spans the area from Meaford to Minden. It is a large area, and with that comes a wide range of electricity needs.

In this region, as we are seeing across the province, communities are looking at more community-based energy solutions. Today you'll hear about how electricity operations and planning for the provincial, regional and community needs are shaping the system for the future.

We're grateful to all of you here today for joining us in an important dialogue about energy. It's important because we need to consider the local perspective and work closely with communities and consumers to develop viable solutions to our collective electricity challenges.

I have a few themes that I would like to touch on today. Last month, the province released its 2017 Long-Term Energy Plan or LTEP. The LTEP forecasts were based on IESO data and also included inputs determined by Ontario's Ministry of Energy to reflect government policy.

The IESO is now tasked with developing an Implementation Plan for nine specific initiatives that are included in the LTEP.

I won't go into each initiative, as you'll hear about them later today, but I will touch on some major themes that were identified in the plan, and how the IESO will be taking a leading role.

Transformation of the sector and growing opportunity for the consumer

Ontario's energy landscape has been transformed in the last 10 years or so. Coal, which at one point made up one-quarter of our installed capacity, has been retired and replaced with renewable generation, refurbished nuclear and natural gas. Consumers have also taken a greater role in meeting system and their own needs.

Since 2006, Ontarians have also saved more than 68 billion kilowatt-hours through conservation and energy efficiency. To put that in perspective, that's about how much electricity Toronto Hydro customers would consume over roughly two and a half years (based on 2016 consumption).

Conservation benefits both customers as well as the wider provincial power system by helping to lower peak demand and by deferring or avoiding the need to build costly new electricity infrastructure. It is the most cost-effective supply resource available, at less than four cents per kilowatt-hour.

Through the Conservation First Framework, the IESO is working closely with local distribution companies, like Toronto Hydro, Hydro One, Alectra Utilities, Burlington Hydro, Veridian Connections and others in the region, to put in place conservation programs that help customers reduce their use of electricity.

By delivering conservation programs under the Save on Energy banner, since 2015 Ontario's local electric utilities have already achieved almost 50 percent of the 2020 target of 7 TWh. And, this has been achieved cost-effectively at 3.3 cents per kilowatt-hour.

The Save on Energy programs help consumers of all types take greater control of their energy use and reduce energy costs. There are opportunities available for all types of consumers, from residential customers to schools, hospitals, manufacturers, retailers and more. The bottom line is that Ontario is committed to putting conservation first, both as a resource for the energy system and as a tool for consumers to manage their energy costs.

A great example of this right here in Vaughan is the grocery store called Yummy Market. Through the Save on Energy Retrofit Program, the store undertook an LED lighting upgrade for its refrigeration units. The project reduced its annual electricity consumption by 57 percent, saving more than \$11,000 annually. The market also experienced some unexpected benefits, such as products staying fresher longer with new lighting that doesn't emit UV rays. It is planning a similar retrofit at its North York store.

Recreational facilities are also taking advantage of the programs. Hockey arenas, for example, are often the hub of a community but they are energy intensive and can be expensive to operate. Chesswood Arena in North York, owned and operated by Buckingham Sports Properties, has four NHL-sized rinks, a pro shop and a large sports bar. The arena undertook both refrigeration and lighting projects to improve its energy efficiency, resulting in \$35,000 in annual energy savings and a payback period of less than two and a half years. It also improved, the ice and skating conditions for patrons.

Incorporating energy efficiency into your operations can deliver benefits that reach far beyond your energy bill.

A growing number of industrial customers are also optimizing their operations and controlling their energy costs through conservation programs like the Industrial Accelerator Program, or IAP. The IAP offers a range of financial incentives that support energy-efficient capital investments.

Take, for example, the steel company ArcelorMittal Dofasco, also known as AMD, in Hamilton. It has participated in the IAP to complete several energy-efficiency projects – including water treatment equipment, variable frequency drives, a new compressed air system, turbine generators, and a nitrogen compressor system retrofit. Each individual project delivers significant energy savings. Since 2011, the company has achieved 125,000 megawatt-hours in annual energy savings and reduced electricity costs by more than \$10 million annually.

AMD takes a portfolio approach to managing energy projects to ensure that energy savings are re-invested back into the business. Provincial incentives they receive are used to finance upcoming or ongoing projects, and net-neutral cash flow is preserved.

The IAP encourages investment in innovative process changes and equipment retrofits to reduce electricity consumption on the provincial system. It also helps companies like AMD become more competitive.

There are also plenty of training opportunities to get engaged with energy efficiency. And the IESO also sponsors engineering support, audits or facility walkthroughs to kick-start moving from ideas into projects. So you can see there are a variety of measures to help businesses of all sizes to manage their usage and reduce costs.

In addition to the transition away from coal-fired generation and increased conservation measures, over the past 10 years we have also seen a significant increase in renewable resources. Today, we have about 4,800 megawatts of wind generation, over 2,300 MW of solar, and about 600 MW of biofuel. We've also seen an increase in hydro resources. This has resulted in a much

cleaner electricity system. In fact, last year over 90 percent of the electricity produced was emissions free.

A lot of this renewable generation is the result of the FIT and microFIT programs that were introduced in 2009. The IESO announced the results of the final FIT procurement in September, which had more than 80 percent of the projects with Indigenous, municipal or community participation. And the microFIT Program just hit its 50 MW annual procurement target about 10 days ago on Dec. 1. More than 26,000 participants across the province have microFIT contracts and are contributing to Ontario's clean energy economy.

As the success of these programs illustrate, we are also in the midst of a shift from a centralized electricity system to an increasingly decentralized one. Our focus has traditionally been on large generators connected to the high-voltage transmission system. Now we're seeing more and more generation being developed and connected at the low-voltage, distribution level. Consumers are taking advantage of the opportunities coming from technology and policy changes that incentivize smaller, local solutions.

In Southern York Region, Alectra, formerly PowerStream, launched a project called POWER.HOUSE, Canada's first virtual power plant, using an aggregate fleet of 20 residential solar and energy storage systems located at customers' homes. They were autonomously controlled through intelligent software to simulate a single, larger power generating facility. In this arrangement, customers benefit from generating their own renewable energy and displacing a portion of their energy from the provincial grid with a significant bill reduction. Customers have the added benefit of outage protection.

Supported by the IESO, this project was intended to study the feasibility of distributed energy resources as an alternative to the traditional wires solution. Initiatives such as this could have broader impacts on the grid as adoption of these emerging technologies and business models increase. These impacts can be in the form of:

- offsetting system demand
- deferring, reducing or removing the need for wires solutions
- being able to provide or augment some reliability services that have been traditionally provided at the bulk power system level.

This is also the kind of innovation that the IESO works to enable.

Like other jurisdictions across North America, Ontario is experiencing the rapid expansion of distributed energy resources. These are small-scale physical or virtual assets on the supply side or the demand side, including generation and storage. We now have about 2,000 MW of solar generation embedded within local distribution company territories, mostly connected to homes and businesses.

That number continues to grow – and is expected to reach nearly 3,000 MW by 2020. It makes important contributions to Ontario’s supply mix, but distribution-connected generation poses some unique operational challenges for us. For example, the IESO has limited visibility into the behavior of these resources. By “visibility” I mean we generally cannot “see” what these resources are doing at any given time as we don’t have information on them sent to our control centre.

So we have:

- several thousand megawatts of embedded generation
- a growing amount of distribution-connected energy storage
- as well as an array of tools and programs to reduce consumption.

Altogether, that makes for a fairly significant blind spot. That’s why we’re working with LDCs to establish better ways of working together to maximize the benefits of these resources, as we did in the case of the POWER.HOUSE example.

Across the province, LDCs are expanding their roles, pursuing new business models and finding new ways to engage their customers. At the same time, customers are playing a more central role in the electricity system through the use of advanced energy technologies, such as self-generation, energy storage and others. As a result, LDCs are forming new partnerships to help navigate energy sector transformation and to capture the value of the changing energy landscape and evolving innovation ecosystem.

What’s clear is that consumers are engaging differently with energy today than they did five years ago. With the introduction of Ontario’s Climate Change Action Plan, initiatives such as the Green Ontario Fund, and the programs available through Save on Energy, customers in Ontario are taking a more active role in managing their energy consumption.

Engaging with energy

Communities are also taking a long, hard look at how they use energy. Community energy planning is a powerful concept. Through the development of an energy plan, communities are coming to understand how they use energy and identifying ways to reduce their consumption (and their costs). They are also setting long-term priorities, objectives and targets; exploring opportunities for renewable generation, microgrids, net metering and other local alternatives; and making informed decisions that will enhance local resilience and prosperity.

There is substantial support for the development of community energy plans from the Ministry of Energy. Close to 100 First Nation communities have received support from the IESO to

develop their own community energy plans, and we have developed further support for communities to begin to implement those plans.

To a greater extent, energy decisions are being made on a local and regional basis. Consumers and communities alike are seeking greater self-sufficiency and a larger role in these decisions – making the discussions that happen at this session so important.

I've spent a fair bit of time describing the supply and demand sides of the energy equation. I'd like to take a moment to focus on the wholesale electricity market that brings supply and demand together. Ontario's electricity market was designed in the late 1990s and opened in 2002, when the electricity landscape looked very different from today. As I've noted, a lot has changed in the past 15 years. We have new resources, new technologies, new players, new business models and new operational requirements to consider.

The Market Renewal Project is a collaborative effort between the IESO and its stakeholders to pursue enhancements to Ontario's electricity market. It will address existing inefficiencies and lay a foundation that will help us prepare for the electricity sector of tomorrow.

Our Market Renewal project is about rebuilding the foundations of Ontario's wholesale electricity markets. It will provide greater transparency, promote competition and deliver more efficient outcomes. The project has a broad reach, addressing the way we schedule energy, procure resources and meet operability needs in the province.

Perhaps more importantly, Market Renewal will also deliver significant financial efficiencies. When fully implemented, the project has the potential to provide net benefits to consumers and generators of approximately \$3.4 billion over a 10-year period.

Evolution of the IESO's stakeholder base

The IESO has a diverse group of stakeholders. They include generators, transmitters, local distribution companies, large-scale industrial consumers, energy traders, academic institutions and many others.

We also engage with communities, because a reliable supply of electricity is essential to supporting community growth – powering homes, schools, businesses, hospitals and transportation. Engaging with communities is an important part of maintaining a reliable electricity supply, now and in the future.

It is also important that we engage with each and every one of you here today.

As the sector continues to evolve, the IESO's approach to engagement is also evolving. We're reaching out to new and different audiences as a way to ensure everyone's voice is heard, and everyone's opinion is considered.

For example, last month we launched a public engagement initiative focused on ways to leverage the energy consumption data held within the Meter Data Management/Repository or MDM/R. The IESO oversees this in its capacity as Ontario's Smart Metering Entity. The MDM/R is one of the largest transaction systems in North America, adding up to 120 million records every day.

Together with stakeholders, we are working to identify opportunities to extract value from this data, while ensuring that all applicable privacy and confidentiality requirements are met. You can find more information about this on the stakeholder engagement section of our website.

In addition to a formal, industry-focused Stakeholder Advisory Committee and Technical Panel, we have established standing committees, working groups and local advisory committees. This is in addition to our continued commitment to our relationships with First Nations and Métis. Our objective is to provide the information needed and the opportunity to provide input into proposed decisions to those that may be affected individuals, communities and organizations.

We want to work with you to collectively plan for the grid of tomorrow.

This is a job we can't do in isolation. We will continue to seek ideas and input from those who are most affected by our decisions and our recommendations – people like you. This will be an ongoing dialogue. , I encourage you to share your views with us, with your LDC, with your municipal officials and with other groups. We invite you to continue the conversation.

Thank you for your time. I look forward to all the discussions that will ensue over the course of the day and to working with you to identify practical, cost-effective solutions that work for the GTA and Central Ontario region.