



**Notes for Remarks:**

**“Ontario’s Changing Energy Landscape”**

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Check Against Delivery

Thank you to the Rural Ontario Municipal Association for having me here today, and to all of you for attending this breakfast session.

I was joking earlier with my staff that to open the conference, you were treated to a rousing speech by one of Canada's greatest contemporary explorers, a prolific storyteller and adventurer who was once in a cage with a polar bear....and today, well, you get to hear about the evolving policy, regulatory and operational framework of Ontario's electricity sector.

While I admit that the two might register differently on the "heart-pumping-excitement meter," I think the themes of exploration and forging new paths are quite applicable when addressing the rapidly unfolding trends in our energy sector.

Our sector is in midst of multiple changes and disruptions, some dramatic, some incremental, but in many ways unprecedented. These changes are yielding exciting new opportunities for communities, consumers and municipalities to play a greater role in the energy sector. To illustrate this, I'd like to show a brief video that highlights some of these major areas of change.

<http://www.ieso.ca/en/powering-tomorrow/technology/peter-gregg-innovations-in-energy-to-power-tomorrow>

We produced this video to support an initiative called *Powering Tomorrow*. It's a new feature on the IESO's website that profiles innovative projects that the IESO is involved with that are preparing us for the electricity sector of tomorrow.

I'll be mentioning a number of resources today for you to hopefully take back to your municipal offices. We've included a take-away hand-out with a variety of links and resources.

As addressed in the video, the IESO plays a unique role in Ontario's electricity sector. Put simply, we wear a lot of hats.

Here are a few examples:

- **We reliably operate Ontario's province-wide system.** That means operating and directing the flow of electricity across the province's transmission system in real time, planning from the next five minutes out to the next 20 years and acquiring the resources we need to keep the lights on.

- **We enable provide-wide energy conservation.** Since 2006, Ontarians have 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. Ontario's Conservation First Framework has achieved about 3.5 TWh of savings, the equivalent of powering about 1,000,000 electric vehicles for a year.
- **We support innovation.** The IESO enables innovation through the information we provide, the funding and programs we offer, and market-based opportunities we facilitate. Innovation can lead to new opportunities for consumers and stakeholders, put downward pressure on costs and enable a more efficient and reliable electricity system.
- **We create electricity market efficiencies.** We are currently working on a fundamental redesign Ontario's electricity market. Through our Market Renewal program we are improving the way electricity is priced, scheduled and procured to meet Ontario's current and future energy needs reliably, transparently, efficiently and at lowest cost. The estimated net benefits of Market Renewal are \$2.2 billion to \$5.2 billion, over a 10-year period.
- **We plan for Ontario's future energy needs.**
- **We work closely with communities to explore sustainable options.** We engage directly 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 a vital part of maintaining a reliable electricity supply, now and in the future. I'll touch on some of the ways we do that in a moment.

Ontario relies on a diverse range of energy resources, both in terms of the generation portfolio itself, but also through the strategic use of conservation and energy efficiency, demand response, clean energy imports and emerging technologies such as storage.

Ontario's electricity system is built to meet peak demand. The Industrial Conservation Initiative, for example, has reduced peak demand by about 1,400 MW in 2017, reducing the need for investments in new infrastructure. Residential, commercial and industrial consumers are providing demand response, tapping into existing infrastructure to create the equivalent of new supply and helping reduce peak demand.

The IESO is also the Reliability Coordinator and the Planning Coordinator for Ontario and works closely with other jurisdictions across North America to ensure reliability of the interconnected power system

### **Ontario's electricity sector**

Ontario's energy landscape has also been transformed in the last 10 years or so. Coal, which at one point made up one-quarter of our installed capacity at about 6,000 MW, has been retired and replaced with renewable generation, refurbished nuclear and natural gas.

Renewable resources now account for 35 percent of the system's energy capacity, with about 14,000 MW.

Ontario continues to experience growth of resources connected to the province's local distribution networks. At the end of 2017, there were more than 3,800 MW of contracted embedded generation within local distribution systems, a 25-percent increase over the previous year. These generators supply electricity to local distribution systems, which in turn reduces demand on the transmission grid.

The conservation and energy-efficiency programs we offer help consumers of all types take greater control of their energy use and reduce energy costs. This is the most cost-effective supply resource available, at less than four cents per kilowatt-hour.

Conservation savings, growing embedded generation and demand reduction programs have offset increased demand.

Through critical investments that we've made in our system, Ontario is now in a stable supply situation that is expected to continue into the 2020s, making this an opportune time to identify and explore more fundamental efficiency options for our system, like Market Renewal.

So the elimination of coal-fired units, the integration of renewable energy, the increase in small-scale, local generation and the emergence of new technologies have dramatically – and permanently – changed the dynamics of Ontario's electricity system.

Our stable supply means the IESO can focus on implementing the needed market design changes.

The IESO is at the forefront of this change and is leading the way to enable opportunities for consumers and communities to take control of their energy use and shape the electricity system around them.

This leads me to the Long-Term Energy Plan.

### **IESO's role in delivering key initiatives**

The IESO has a key role informing and implementing policy. The IESO informed the development of the province's 2017 Long-Term Energy Plan (LTEP), which was released in late October 2017.

We are now in the process of finalizing an Implementation Plan that will outline how the IESO will work with Ontario communities, stakeholders, First Nations and Métis to implement initiatives in the Government of Ontario's 2017 LTEP.

Here are some of the key areas that I thought I'd highlight:

#### **Evolving First nations and Métis energy support programs**

- The IESO is expanding access to conservation programs for First Nations and Metis to ensure they have opportunities to better manage their electricity use and costs.
- We are also evolving our energy support programs for First Nations and Metis, including consideration of community energy plans, to ensure better alignment with community needs and interests.

#### **Renewable distributed generation demonstration projects**

- The generation and delivery of energy in Ontario is no longer a one-way, top-down process. The increase in distributed energy resources is leading to a more decentralized and interconnected system, and transforming conventional electricity distribution networks.
- We will be developing a program to support a select number of innovative renewable distributed generation demonstration projects.

- The aim is that these projects will help inform future grid modernization and net-metering policies, as well as steer further integration of these resources into Ontario's energy system.

### **Removing barriers to energy storage**

- As Ontario moves to more competitive and technology-neutral procurement of resources through annual capacity auctions, energy storage resources need be able to compete in the delivery of services to ensure their potential is realized.
- We will work to identify potential obstacles to energy storage resources through review of the market rules, industry codes and regulations for storage resources.

### **Competitive transmission procurement**

- We'll be engaging municipalities, Indigenous communities and transmitters to develop a transparent and flexible transmission competitive procurement framework.
- This will result in a more inclusive approach to transmission development in Ontario and may reduce the cost of new high-voltage transmission facilities.

### **Review and report on regional planning process**

- I'll speak to this in a bit more detail shortly, but essentially our review is to ensure the electricity regional planning process is efficient, integrates with other planning initiatives, considers transmission facility end-of-life and effectively considers cost-effective alternatives to "wires" solutions to meet regional needs.

### **Municipal energy use in Ontario**

Turning to the municipal perspective, the IESO commissioned some research on the "Ontario Municipal Energy Profile." It was produced in collaboration with AMO and a number of municipal stakeholders to gain more insight into the current state of municipal energy use in Ontario, with a focus on future trends and sustainable energy improvements.

Our aim in developing the resulting report is to equip municipalities with valuable data and analysis to inform the next round of your energy conservation, climate change adaptation and GHG reduction plans.

I'm going to speak to a few of the key findings, and my colleague, Vicki Gagnon, has been actively involved in the report's development and would be happy to answer your questions throughout the day as well.

The report, which will be released at the end of next month, was developed using a variety of data sources, including our own program data, surveys and interviews with municipalities as well as self-reported data.

As indicated here, Ontario municipalities use a variety of fuel sources in their operations including electricity, natural gas, hot water and steam from district heating, chilled water from district cooling, propane and fuel oils. However, as we can see here, the majority of municipal energy is provided by electricity at just over 60 percent (62.7 percent, with natural gas at 34.9 percent).

In the last 10 years, municipalities have made major strides in incorporating energy efficiency and conservation into their systems, reducing overall consumption by about 10 percent.

Here we see a breakdown of municipal energy use. Water and wastewater treatment and pumping continue to make up over 40 percent of municipal electricity consumption, and street lighting continues to make up approximately 17 percent of municipal electricity consumption.

(Other uses include multi-purpose at 18 percent, arenas at 15 percent and municipal buildings at eight percent.)

Let's look at some of the ways that this has been achieved and some of the opportunities that are still out there...

To date, about 75 percent of municipalities have completed at least one project through the IESO's Save On Energy programs.

Over the last six years, Ontario municipalities have received roughly \$44 million in incentives, invested over \$200 million in retrofit projects and achieved over \$100 million in electricity savings, resulting in annual electricity savings of 330 GWh. To put those energy savings in perspective, that's about as much electricity as a community the size of Orillia consumes in a year.

The majority of the incentive dollars were delivered through the Save On Energy Retrofit Program, which includes lighting upgrades, motor and heating installations, new control systems and others.

### **Further municipal opportunities for efficiencies**

According to our analysis, municipal street lighting consumes an estimated 850 GWh, representing 17 percent of a municipalities total electricity consumption. As communities expand, and new infrastructure is required, this will only increase.

Based on energy savings of roughly 30-65 percent from these retrofit projects and assuming new fixtures installed have been LEDs, Ontario municipalities are achieving approximately \$80 million in their annual electricity and maintenance cost savings.

While street lighting retrofit projects have been a key priority for many municipalities, our analysis shows that over 60 percent of municipalities could still benefit from updating to LED street lighting.

Municipalities can also explore adaptive controls, which automatically adjust light output using motion detectors or photocells, as well as innovative off-grid solutions, such as solar-powered LED street lights.

As I mentioned earlier, water and wastewater treatment and pumping account for over 40 percent of municipal electricity consumption.

The province's LTEP has identified that it is exploring opportunities to set or update energy-efficiency standards for key electrical equipment in drinking water and wastewater treatment plants.

The IESO also offer programs targeted to water and wastewater treatment facilities that help reduce energy use, cut down on operating costs and improve return on investments.

If you participate in our specially designed Process and Systems or Retrofit Program, you can receive up to 70 percent of project costs for energy-efficiency upgrades.

Pump trimming can reduce electrical demand by up to 25 percent, variable frequency drives can reduce pump energy use by up to 55 percent, and upgrades to high efficiency blowers to cut energy by over 10 percent.



For example, Hamilton's Department of Energy, Fleet, Facilities and Traffic accessed \$2 million in Save on Energy incentives to implement energy-efficiency projects that lowered their electrical costs by 20 percent.

Save on Energy programs also provide incentives for a wide range of energy management training.

Since 2013, 20 municipal organizations have received funding through the IESO's Training and Support initiatives, including Building Operator Certification and Certified Energy Manager training. The IESO is also currently funding 15 Energy Managers to support energy management activities.

While there has been success to date, this report has also identified potential barriers, which we are working to address. Some of the challenges we've heard include...

- Finding time to dedicate to training – based on the respondents to our survey was the most significant challenge to obtaining energy management training.
- 67 percent of municipal survey respondents felt that they have general knowledge of energy conservation opportunities, but they require specific in-house knowledge to identify, design, plan and make the business case for more complex sustainable energy projects.
- Municipalities in Northern Ontario reported that they find it challenging to get their staff trained on energy management practices because many of these training courses are typically offered in-person. They indicated that more online training courses would reduce the cost of traveling and training and allow more staff to be trained in energy management.

The IESO is working on initiatives to enhance training opportunities – including the development of pilots that would include more targeted on-site training, web-based training or a combination of the two.

The IESO offers two initiatives where municipalities can reduce their electricity costs by shifting or curbing demand during peak periods: the Industrial Conservation Initiative (ICI) and the Demand Response (DR) Auction.

- ICI enables participants to save on their Global Adjustment costs if they are able to reduce their demand during the top 5 hours of peak demand in the year. In total, 72 municipal facilities are participating in ICI.
- The DR Auction is a competitive process through which resources are selected to be available to reduce their electricity demand, as needed, during certain peak periods of the year. We have seven municipalities that are current DR participants, through an aggregator.

On the emerging technologies front, we are supporting electrification and net zero construction as ways to reduce sector-based emissions.

### **Community-focused energy planning**

Since 2013, communities have participated in a formalized regional planning process to identify their electricity needs and develop cost-effective solutions for meeting them.

There are 21 electricity regions across the province, divided based on electrical infrastructure boundaries.

Regional planning looks at each region's unique needs and considers conservation, generation, transmission and distribution, and innovative resources to meet these needs.

Over the past three years, the electricity needs of all 21 of Ontario's planning regions have been evaluated, completing the first full cycle of regional planning assessments across the province. In total, 16 Integrated Regional Resource Plans were completed.

Local advisory committees have helped their communities to understand regional electricity issues. These committees allow residents to provide input, and their advice improves the implementation and the regional plan. We have 11 of these committees across the province. Community engagement is also crucial to linking regional energy plans with community energy planning.

The IESO will now review the regional planning process and report back with options and recommendations to address the challenges and opportunities that have emerged.

The IESO will work with transmitters, municipalities, Indigenous communities, consumers and other interested parties to enhance the regional planning process to better meet the needs of communities.

Community energy plans help establish local priorities for how energy should be generated, delivered and used in the community now and into the future.

The Energy Community of Practice (ECOP) initiative is being led by QUEST and the Clean Air Partnership and is being supported by the IESO.

The objectives of the ECOP initiative are to:

- Build an understanding of the benefits of community energy plans (CEPs) to accelerate energy efficiency and renewable energy projects and advance economic development opportunities
- Provide training, resources and skills to build municipal capacity towards the development and implementation of CEPs
- Foster improved partnerships and collaborations with key stakeholders (especially utilities and energy companies) and better enable these communities to identify priority local energy projects.

Support and funding for the development of municipal energy plans is available through the Ministry of Energy. The ministry will cover 50 percent of eligible costs to create new plans or continued work on existing plans. You can go on the ministry's website for more information.

A total of 36 municipalities have municipal energy plans underway or complete.

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.

### **Opportunities to engage with the IESO**

Municipalities are now more empowered on making decisions about community energy planning and playing an increasingly important role maintaining a reliable electricity supply.

Municipalities are leveraging technologies and efficiency measures to control operating costs and enable more self-sustaining energy options.

The IESO is playing a role in facilitating innovation and the use of emerging technologies and energy-saving technologies.

There are a variety of ways to get involved and participate in engagement sessions with the IESO. You can provide feedback on IESO's LTEP Implementation Plan initiatives, request the IESO to meet with your municipality, or participate in the 2018 IESO regional forums. The hand-out material contains all of the important links and addresses, so I encourage you to use them.

Thank you for your time and attention this morning. With the remaining time, I'll answer any questions you may have.