

Ontario's Reliability Outlook

Powering a Green Future

November 13, 2007

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- Thanks for the invitation to speak at the conference here today. I have spoken at this event in two previous years and so I put a bit of extra effort into this year's presentation. I don't want the "three strikes and you're out" rule to come into play!
- Seriously though, it's a pleasure to be back in Ottawa and to have the opportunity to speak with you again.
- There are a number of things that I want to cover today:
 1. A quick reminder of who is the IESO and what we do? And more importantly – why should this matter to you?
 2. An update on the reliability picture for the province, and Ottawa.
 3. The path Ontario is taking to Power a Green Future and what you can do to help.

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On Demand.

The IESO's Role

- There are a number of different entities but all have their own set of accountabilities and defined responsibilities

Hydro Ottawa

ONTARIO POWER GENERATION
Bruce Power

TransAlta

Local Distribution Companies

Wholesale Customers

Retailers

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hydro One

OPA
Ontario Power Authority

Ontario

- The Independent Electricity System Operator or IESO as we are more commonly known, is a not-for-profit corporate entity that was established in 1998 by the Government of Ontario
- The IESO brings Ontario electricity suppliers and consumers, or the sellers and buyers, together.
- We manage Ontario's electricity grid by directing the operation of generation and its reliable flow to consumers across the transmission system.
- We also manage the wholesale electricity market in which the supply and demand for electricity are balanced.
- The IESO plays a well coordinated role with the Ontario Power Authority – or OPA – who is responsible for ensuring an adequate, long-term supply of electricity in Ontario through generation development, power system planning and the activities of the conservation bureau.

- Hourly rate for electricity is set in Ontario's electricity market
- Price fluctuates according to:
 - Weather
 - Generator availability
 - Time of day
- Price is determined by balancing offers to supply energy against overall provincial electricity needs



- Since 2002, the price of electricity has been determined by the forces of supply and demand in Ontario's wholesale electricity market
- Suppliers of electricity compete to provide electricity to the market, while some users of electricity offer to cut consumption should the price of electricity reach certain levels
- The IESO takes this information and matches it against projected demand for electricity
- We accept the lowest-priced offers required to meet electricity needs
- In order to maintain reliability, supply and demand for electricity must balance at all times
- It's a 7x 24, 365 days per year operation

Supply

- Total supply available
 - Generation located inside Ontario
 - Import capability from outside Ontario

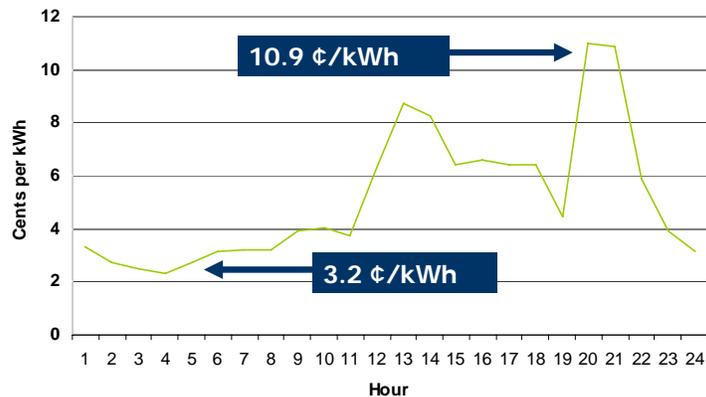


Demand

- Weekdays vs. weekends and holidays
- Time of day
- Weather



- The price of electricity is influenced by how much supply is available and how much of it is being used
- The price of electricity changes every five minutes, but for most consumers it is the aggregated hourly price that matters most
- The price can vary greatly based on the time of day, the day of the week and most importantly, the weather
- However, the hourly price that consumers actually pay is affected by a number of adjustments such as the Provincial Benefit and the Ontario Power Generation rebate. Depending how the average hourly price compares to the rates, the Provincial Benefit could be either a charge or a credit to consumers.
- The IESO website has more information about these rebates at www.ieso.ca/rebates



Businesses with interval meters pay the hourly price for electricity.

- This chart shows how the price can fluctuate over the course of a day (August 14, 2007) due to the changes in supply and demand.
- Prices in the wholesale market can be quite variable over time – ranging on this day from 3.2 cents/kWh to almost 11 cents.
- This is a typical summer day where the peak for demand and price occur in the afternoon between 4pm and 6 pm
- In this case the peak price is over three times the lowest price at night. This is not always the case. But prices at night and on weekends are on average are 35 per cent lower than weekday prices.
- These variable prices represent the true cost of producing power.
- Since the market opened in 2002, there is a perception that the price of power has steadily increased. But in fact the average wholesale price of electricity in Ontario has dropped by about 2% in every year since 2002 – with the exception of 2005, when we had high natural gas prices after hurricanes Rita and Katrina.
- As you can see from the slide, the market provides transparent price signals that enable all end users to be able to react to that hourly price and to adjust their consumption accordingly.
- And the government's smart meter initiative, which would see smart meters in every home and business by 2010, will allow end users to assess and achieve the benefits of adjusting their consumption to the lower priced times of the day.

- Overall, Ontario's supply-demand picture remains relatively positive, continuing the trend that has emerged since late 2005
- The IESO's latest 18-Month Outlook indicates that:
 - More than 2,900 megawatts (MW) of new supply is expected to come into service, including more than 2,000 MW of gas-fired generation, and over 700 MW of wind generation
 - With all of the planned additions, sufficient resources will be available within Ontario to meet expected requirements under normal weather conditions
 - On some occasions, Ontario may need to rely on power from neighbouring jurisdictions, particularly if extreme weather occurs or if equipment performance is below normal

- Ontario's supply-demand picture remains positive with more than 2,900 megawatts of new supply expected to come into service over the next year and a half

- The IESO's most recent 18-Month Outlook indicates that with all of the planned resource additions, sufficient resources will be available within Ontario to meet expected requirements during most of the period under normal weather conditions.

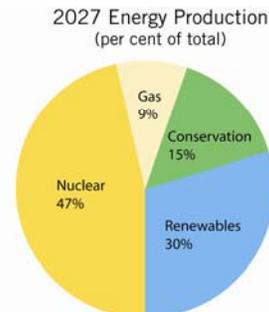
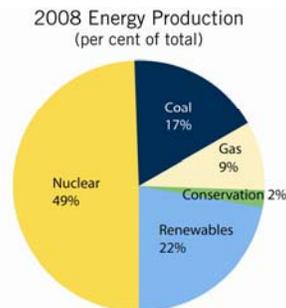
- However, on some occasions, Ontario may need to rely on power from neighbouring jurisdictions, particularly if extreme weather occurs or if equipment performance is below normal.

- The new supply scheduled to come into service includes more than 2,000 megawatts of gas-fired generation and over 700 megawatts of wind generation.

- This would represent the highest amount of additional capacity in an 18-Month Outlook period since the Ontario electricity market opened in 2002.

- The majority of this new capacity is scheduled to come into service near the end of the study period.

- IPSP provides comprehensive supply plan for Ontario
 - Roughly 15,000 megawatts (MW) of new or refurbished resources are planned, including the replacement of 6,400 MW of coal-fired generation
 - Includes generation projects, transmission enhancements and conservation efforts estimated to cost roughly \$60 billion
 - IESO will ensure IPSP integrates into day-to-day operations

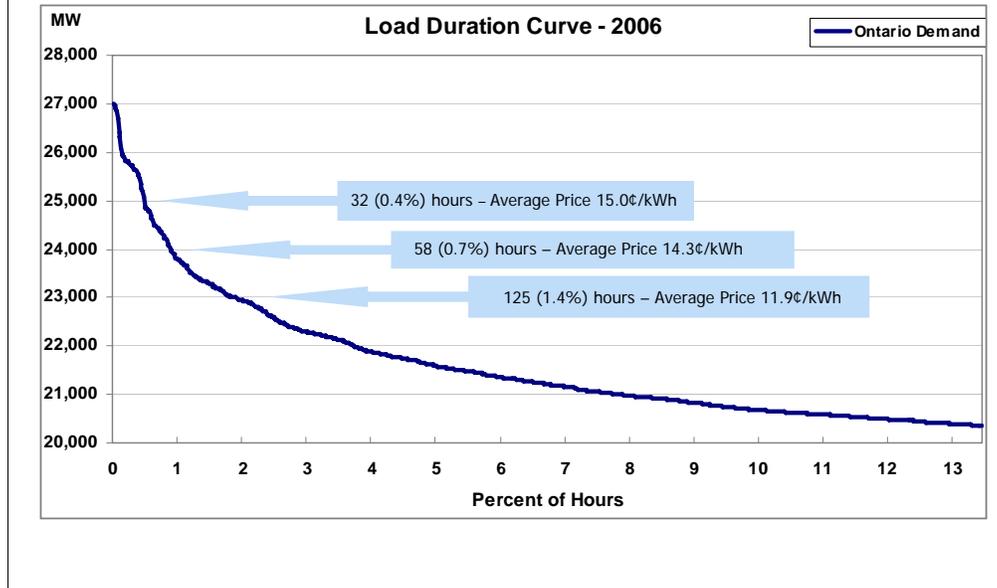


- The OPA's IPSP is the roadmap for future development of the power infrastructure of our province and the first comprehensive plan we've had in 20 years.
- The IESO has been actively involved in the development of the IPSP.
- We provided assessment criteria, reserve requirements and generation and transmission assessments that have served as the foundation for the OPA's system analysis and decisions.
- Highlights of the plan include:
 - 45% of Ontario's electricity supply will be provided by conservation and renewable sources by 2025. Plus 8% from natural gas and 47% from nuclear power.
 - 15,000 MW of new or refurbished resources are planned for 2015, including 6,400 MW specifically to replace coal-fired generation.
 - The IPSP includes generation projects, transmission enhancements and conservation efforts estimated to cost roughly \$60 billion.
- There is of course no shortage of debate surrounding the nuclear issue and the role it will play in our province's future.
- And it's not up to me to settle that debate. But since the conference today focuses on powering a green future...it would be remiss of me not to talk about nuclear for a minute.
- There are some that believe that nuclear's lack of CO2 emissions would allow it to be classed as a green source of energy...and as good news for the environment. If that's the case, then the supply mix for the province could be viewed as 92% green.
- As I said, it's not for me to decide. But it is one perspective.
- One of the other ways that the province is encouraging green energy is through the OPA's Renewable Energy Standard Offer Program. This program makes it easier for small renewable projects to contribute to our overall supply. Wind, water, solar photovoltaic and biomass can sign up to receive payment for the power they provide to local distribution companies.
 - Hydro One has over 1200 proposals, while I understand that Hydro Ottawa has received 40 requests for information and one application.

- Reliability outlook for the Ottawa region positive
- Transmission work underway to construct 1,250 MW interconnection between Ontario and Quebec
 - Project will provide long-term reliability benefits to the region
 - Scheduled for completion by March 31, 2009
- Transmission upgrades may be required in the future in order to meet load growth in the area
- IPSP indicates potential for more than 500 MW of wind generation

• March ORO/18-Month Outlook notes:

- The 1,250 MW interconnection between Hawthorne TS in Ontario and Outaouais station in Québec is scheduled for completion by March 31, 2009. The project will provide long-term reliability benefits to the region
- Transmission outages in the Ottawa area, related to the completion of the 1,250 MW interconnection between Hawthorne TS in Ontario and Outouais station will result in a small reduction in Flow into Ottawa (FIO) limit, but the transmission system will be adequate to supply the projected Ottawa zone demand.
- In the longer-term, the IPSP indicates that there is a potential for cost-effective wind development in eastern Ontario. Specifically, there is the potential to develop 534 MW of wind generation.



- A key part of the IPSP of course, is conservation.
- You may not need another argument as to why conservation is so important. But I'm going to give you one anyway.
- This is a System Operator's take on the value of conservation – a load duration curve.
- This curve illustrates the impact of demand peaks on our infrastructure and the price.
- In 2006, for example, Ontario demand surpassed 25,000 MW for only 32 hours of the year – with an average price of 15 cents/kWh.
- We have been trying to emphasize the importance of this curve to the future design of our system and more importantly, the role that conservation and demand management can and should play going forward - frankly we can't afford, environmentally or financially, to ignore the opportunities it presents.
- A megawatt saved means that it does not have to be built. That's good for the environment. Simply put, conservation and demand management are key to creating a more efficient use of our infrastructure – and all the benefits that flow from that efficiency.

- Shifting electricity consumption from one period to another
- Opportunities for demand response:
 - IESO dispatchable loads, Emergency Load Reduction Program (ELRP)
 - OPA Demand Response Programs



•The way we use electricity is equally as important as how much we use. Demand response is just one way of managing your electricity use more effectively. Conceptually, it means to shift your electricity use from one period to another to receive compensation and/or enhance system reliability.

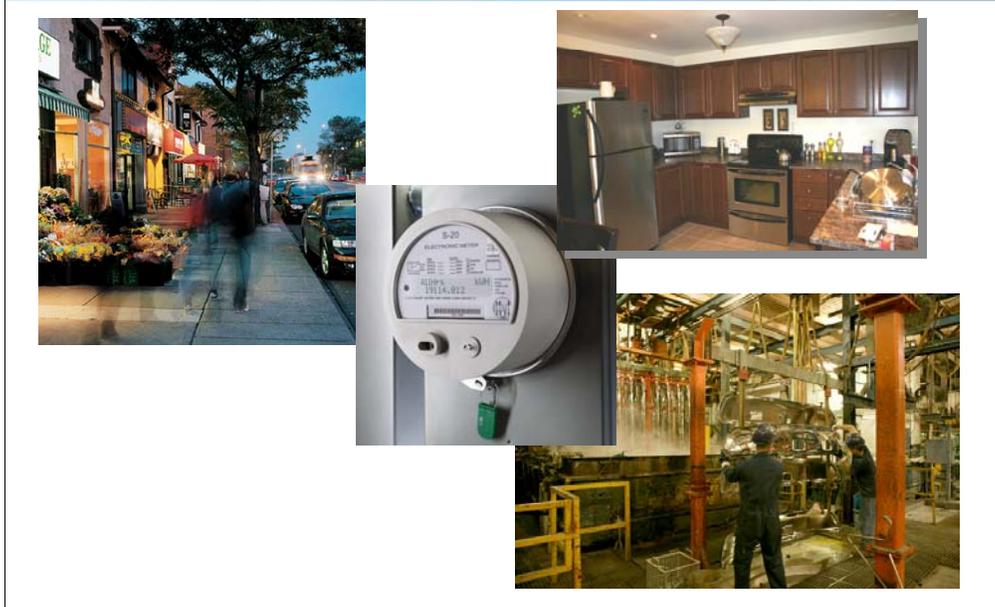
•As I outlined on the previous slide, conservation and demand response reduces the need for the province to use or build more expensive generation when demand levels are high.

•There are a number of ways that customers can participate in demand response programs.

- Becoming an IESO dispatchable load which provides payments for customers who are able to reduce their use of electricity in response to instructions from the IESO

- The IESO Emergency Load Reduction Program which provides financial incentives for participants who are able to reduce their load when the system is under heavy strain.

•The OPA is also developing Demand Response Programs. For more information on these programs visit the OPA website at www.powerauthority.on.ca. The IESO supports the OPA programs, providing dispatch instructions and settlement services.

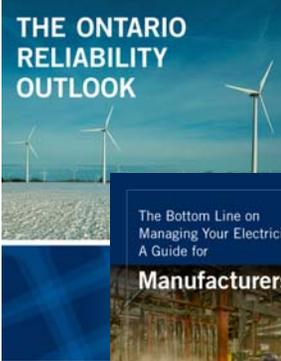


- When the market opened in 2002, I think that there were two things that we could have done better – ensuring there was a buy side to the market and ensuring that customers and politicians were better educated and knew what to expect.
- Recently, the IESO has been spending more time helping people have a better understanding.
- Our Customer Education program has been targeted at those businesses that use more than 250,00 kWh per year and the goals are to:
 - Educate customers about how the electricity market operates;
 - Empower customers exposed to the market price to better manage their electricity costs; and
 - Demonstrate how customer actions can contribute to system reliability and benefit the environment, as well as your bottom line.
- Typically, people have viewed the market as two very distinct markets...the wholesale market and the retail market, when in fact we need to view it as just one market. At the end of the line, there really is just the one consumer...and no matter how little or how much electricity you use, you need the tools to allow you to manage your use.
- One thing that will help in this regard is the government's smart metering initiative – to have smart meters installed throughout the province by 2010. Local distribution companies are on track to install 800,000 smart meters by the end of this year.
- This initiative can enhance the reliability of the power system by providing customers with one of the tools they need to help shift their electricity use to off-peak hours. As I outlined earlier, that shift in use would reduce the need for expensive forms of generation to meet the short duration peak demands. But perhaps even more important, that shift in consumption reduces your bills in two ways: lower commodity cost at the time of consumption and lower embedded capital costs because of the reduced amount of generation that has to be built. And less generation is more "green".
- The IESO is working on this initiative in two different ways:
 - We've been designated the Smart Meter Entity, responsible for the administration and operation of the Meter Data Management/Repository and for coordinating this function into the provincial metering and customer information systems owned by LDCs.
 - In addition, in partnership with the Ministry of Energy and a small group of LDCs, the IESO is launching a communications pilot program to support consumers in their transition to time-of-use rates. The program will test the effectiveness of messages and communications materials in triggering load-shifting behaviour.

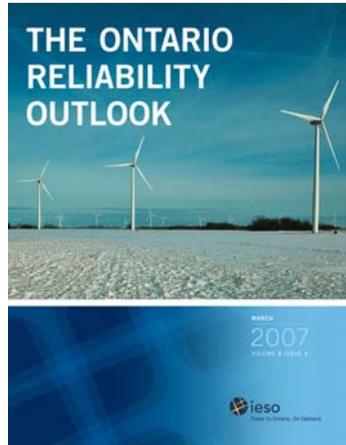


More Information

- Access one of many publications to learn more about how to get started
 - New: *The Bottom Line on Managing Your Electricity Costs: A Guide for Manufacturers*
- Workshops:
 - Ottawa February 4/5, 2008
 - Renfrew February 6/7, 2008
- Visit the IESO's website at www.ieso.ca for more information




- I hope that I've left you with some information about how this province is moving down a greener path, and how I believe that Ontario's market can help give customers the tools and information that they need to not only better manage their electricity costs, but contribute to system reliability and benefit the environment.
- For more information please visit our website. And our customer relations department is also happy to answer any questions you have about the market or about electricity prices.
- In addition, there are a number of workshops that we're offering in the Ottawa region in association with Natural Resources Canada and the Ministry of Small Business and Entrepreneurship:
 - Ottawa – February 4 and 5, 2008
 - Renfrew – February 6 and 7, 2008
 - Check our website for registration details
- These workshops are specifically designed to help businesses to better manage their electricity costs.



1. The reliability outlook for Ontario is positive, if ...
2. The IESO will continue to play its part
3. Will you?

Just like last year, I have three messages to leave with you:

1. If the weather is normal, if generation and transmission continue to perform as well as they have recently, and if new projects come into service on schedule, then all will be well in the short and long term;
2. As well as its day-to-day operational responsibilities, the IESO can be relied upon to monitor the outlook and deliver objective assessments, even if the messages are not always welcomed, and
3. You the customers have a number of opportunities to influence your destiny, in terms of reliability, the environment and, especially, your bottom line.