

# The Changing Realities of Ontario's Electricity System

Paul Murphy President and CEO, Independent Electricity System Operator (IESO) Waterloo Institute for Sustainable Energy November 19, 2009





# Who We Are and What We Do

- The IESO is a not-for-profit entity established in 1998 under the Electricity Act to manage Ontario's power grid.
- The IESO:
  - Directs the flow of electricity across the transmission system to meet the province's power needs
  - Balances demand for electricity against available supply through the wholesale market
  - Manages the financial operations of the \$10-billion wholesale market
  - Oversees emergency preparedness activities for Ontario's power system
  - Sends real-time price-signals to trigger demand response





#### Ontario at a Glance (as of October 2009)

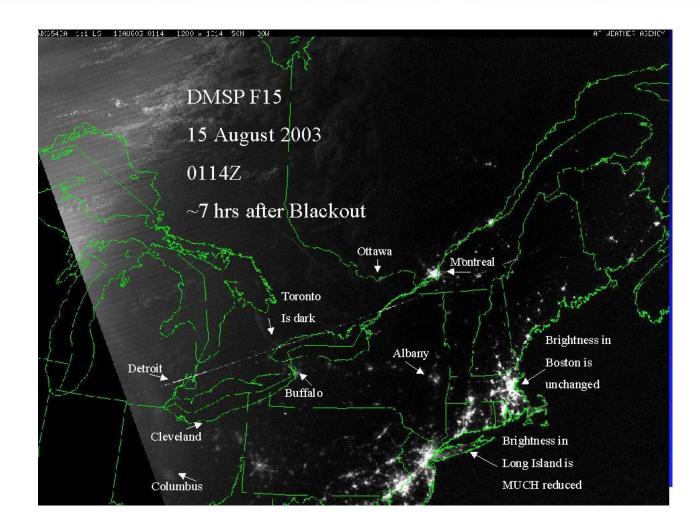
Installed Capacity	35,370 MW
Record Summer Peak	27,005 MW (August 1, 2006)
Record Winter Peak	24,979 MW (December 20, 2004)
Total Annual Energy Consumed	148 TWh (2008)
Customers	4.5 million
Ontario Import Capability	4,600 MW
Transmission Lines	30,000 km
	(18,600 miles)
Average Price plus Adjustments	5.94¢/kWh



The IESO is the reliability coordinator for Ontario and works closely with other jurisdictions to ensure energy adequacy across North America.

# The Blackout: What it looked like



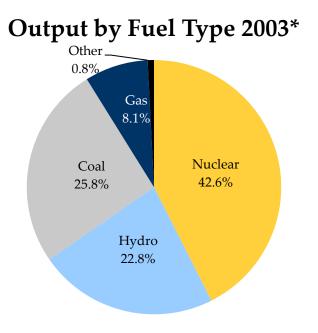


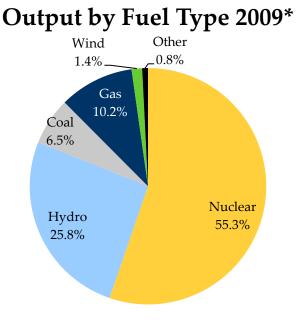


- The North American Electric Reliability Corporation (NERC) is the electricity sector coordinator for critical infrastructure protection
  - Mandatory reliability standards
  - Risk assessments
  - Better training
  - Better tools
  - Electricity Sector-Information Sharing and Analysis Centre (ES-ISAC)



# Output by Fuel Type – Then and Now





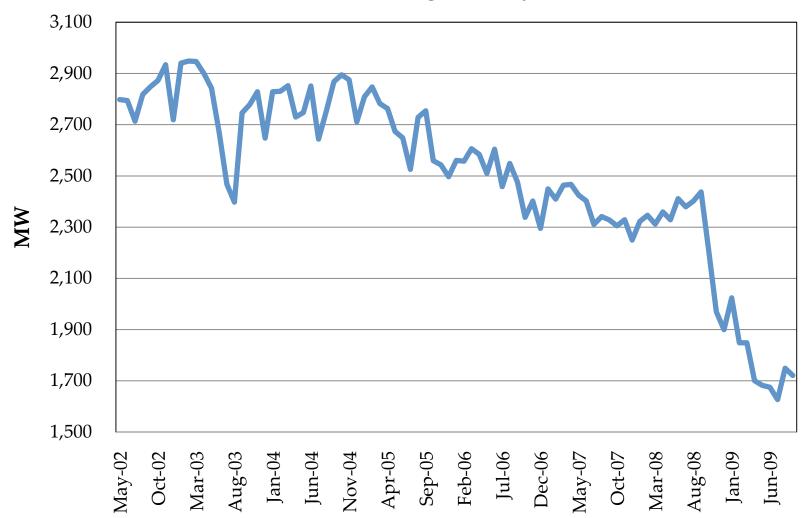
\* Data from January - October



# Wholesale Industrial Demand

7

**Total - Wholesale Average Hourly Demand** 





# **Changing Realities**





# Green Energy and Green Economy Act

On Demand.







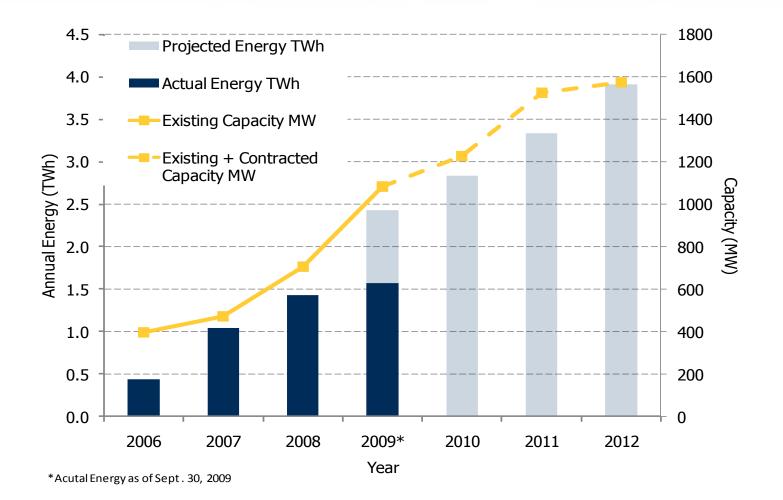






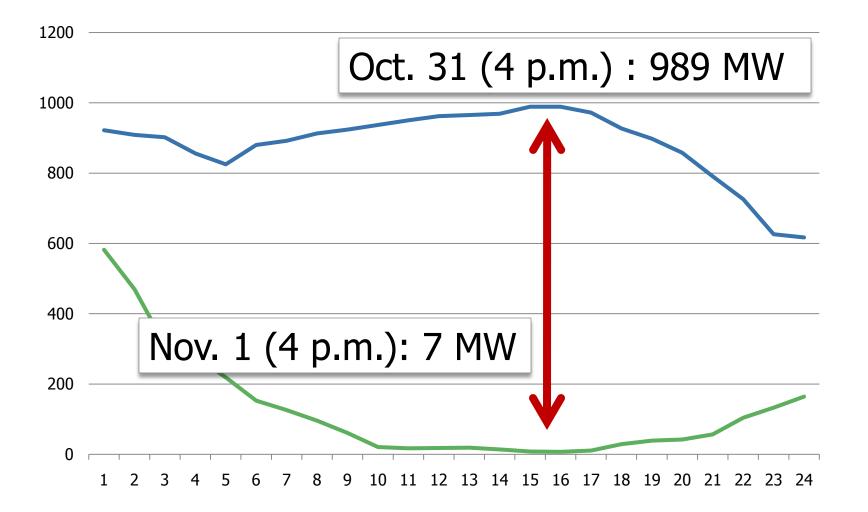


## Wind Generation Forecast





Wind Variability









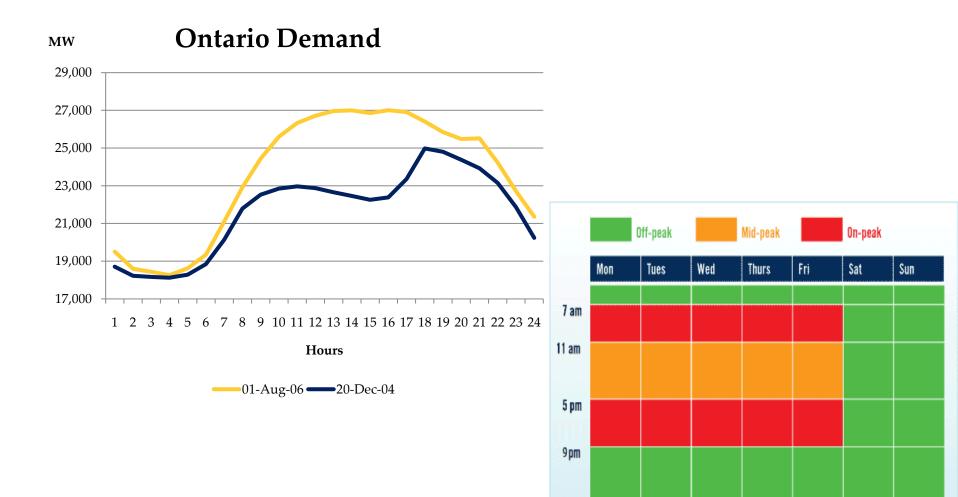


### **Electric Vehicles**





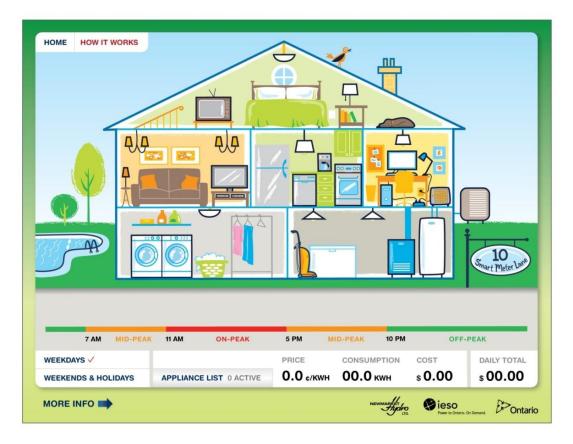
#### **Time-of-Use Prices**





#### 10 Smart Meter Lane

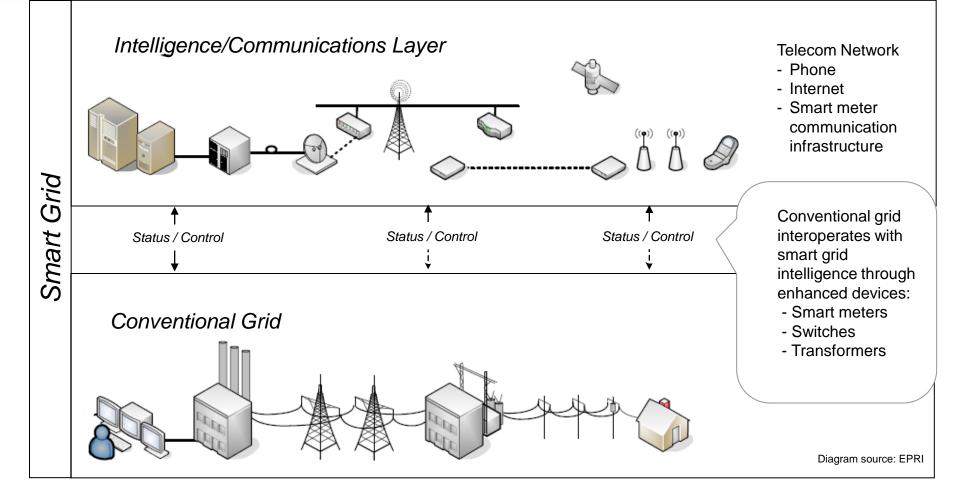




www.ieso.ca/house

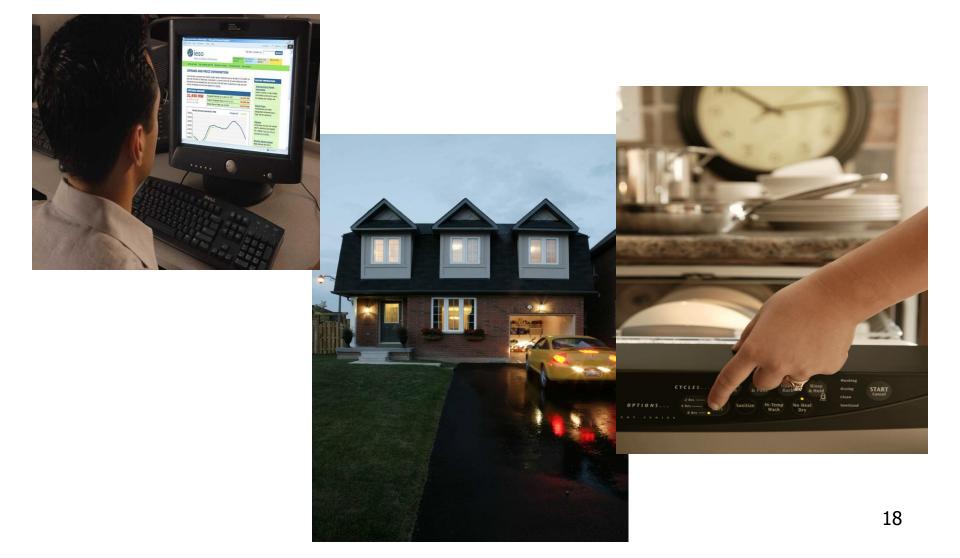


# Smart Grid: The Modern Electricity System





### Smart Grid: The Consumer





#### **IESO Resources**

- The IESO has a range of resources available to help you understand the electricity market and manage your electricity costs
- Visit <u>www.ieso.ca</u> to access market data and download helpful energy management booklets
- Contact IESO Customer Relations at 1-888-448-7777 or customer.relations@ieso.ca



The Bottom Line on Managing Your Electricity Costs: A Guide for

#### Manufacturers

eso

#### IESO WIND TRACKER

See how wind power is helping to meet Ontario's electricity needs. This information does not include wind generation capacity located outside the transmission grid.



To embed the IESO Wind Tracker on your web page or blog post, click the 'SHARE +' button above.

Note: This data is updated every hour, however, there is a one hour time delay in publishing the results.

