

# The Evolution of Ontario's Power System

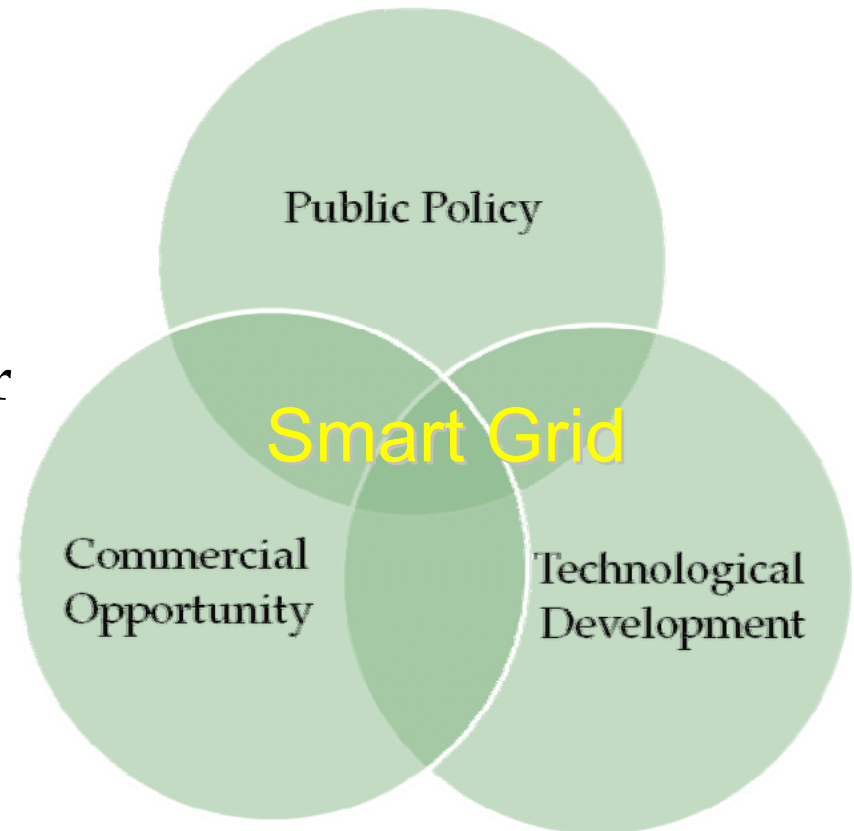
Kerry Noble - Director, Information & Technology  
Independent Electricity System Operator (IESO)  
EDIST - Wednesday, January 20, 2010





- Ensure the reliable operation of the power system
- Efficiently manage the wholesale electricity market
- **Balance Load and Generation**
- Integration takes place through the wholesale electricity market

- What is the “*Smart Grid.*”
- Customers controlling their appliances, self healing transmission and distribution systems, monitoring the carbon content of energy of producers or consumers – probably yes to all plus much more .....
- The smart grid is at the intersection of public policy, technological advancements and new commercial opportunities.
- The IESO’s role allows us to appreciate all three perspectives.



The IESO has several roles which directly impact on the evolution of the smart grid in Ontario...

- Acts as Ontario's "Smart Metering Entity"
- Facilitates the Ontario Smart Grid Forum
- Carries out various initiatives under the *Ontario Green Energy Act*
- Works with various levels of government and the ISO/RTO Council (the IRC) in the US on smart grid policy and development

- The IESO's experience as the Smart Metering Entity has given us valuable insights into what we assume will be some of the challenges that may lie ahead for the evolution of Smart Grid in Ontario:
  - Technological deployment across Ontario's distribution sector plus the transmission sector
  - Standards for interoperability, cyber security and privacy of information issues
  - Consumer education and awareness
  - Etc.

- Industry leaders brought together to develop a vision for the development of a smart grid vision for the province
- Focus of the Smart Grid Forum:
  - Identify and develop opportunities in Ontario,
  - monitor developments occurring in other jurisdictions; and,
  - identify issues for each sector
- In February, 2009, the Forum issued its preliminary recommendations in a public report...



- Provincial Government should facilitate Ontario's smart grid, by:
  - Clarifying authorities
- Industry partners should work together to:
  - Develop requirements for the monitoring of distributed generation, energy storage and responsive load
  - Determine who should have the authority to direct operations of these new facilities
  - Propose pricing arrangements for these facilities to support reliability that are also consistent with the market
- A comprehensive plan is needed to enable electric cars in Ontario



## Enabling Tomorrow's Electricity System

Report of the Ontario Smart Grid Forum

## Objectives:

- Incent renewable energy projects
- Promote a “culture of conservation”

## Smart Grid Implications of the Act:

- Supports significant investments into transmission networks and a smart grid for Ontario
- LDCs to develop smart grid plans for approval by the regulator
- LDCs, municipalities, and even homeowners to be renewable power suppliers

## Legislation also calls for:

- More generous rates for small renewable generation
- Streamlined approvals processes



- Three Focus Areas specifically set out for the “Smart Grid” under the *Green Energy Act*:

i. to provide demand response, price information and load control to electricity customers;

ii. enabling the increased use of renewable energy sources, connected to the distribution system;

iii. facilitating the use of emerging, innovative and energy-saving technologies and system control applications

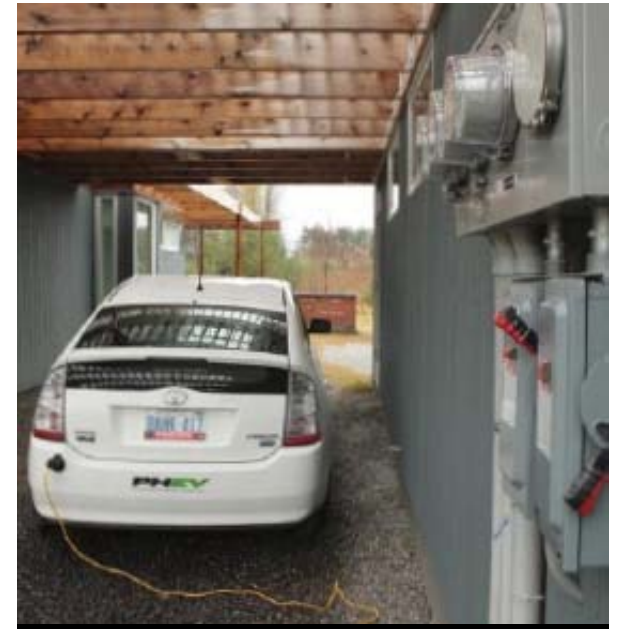


## Current and Prominent Issues:

- Customer Empowerment
- Interoperability
- Customer Privacy
- Security and Reliability
- Public Policy Goals and Environmental Issues
- Private Sector Input

# Issue: Customer Empowerment

- “Customer” and “consumer” will no longer be synonymous terms.
- With empowered customer comes a widening array of commercial products to support them.
- The IESO, is working through the Smart Grid Forum to examine the new demands (both informational and power flow) that empowered customers will place on the smart grid.
- In the longer term the presence of electrical vehicles (and their inherent storage capacity) and their role as a distributed generator contribute to the notion of a more empowered customer.



- Around the world, numerous standards bodies are currently reviewing, developing and recommending interoperability standards for various smart grid components, especially the ones that need to communicate to each other.
- Many of these standards will ultimately affect the development of the Ontario Smart Grid.



International Electrotechnical  
Commission



The Standards Council of Canada

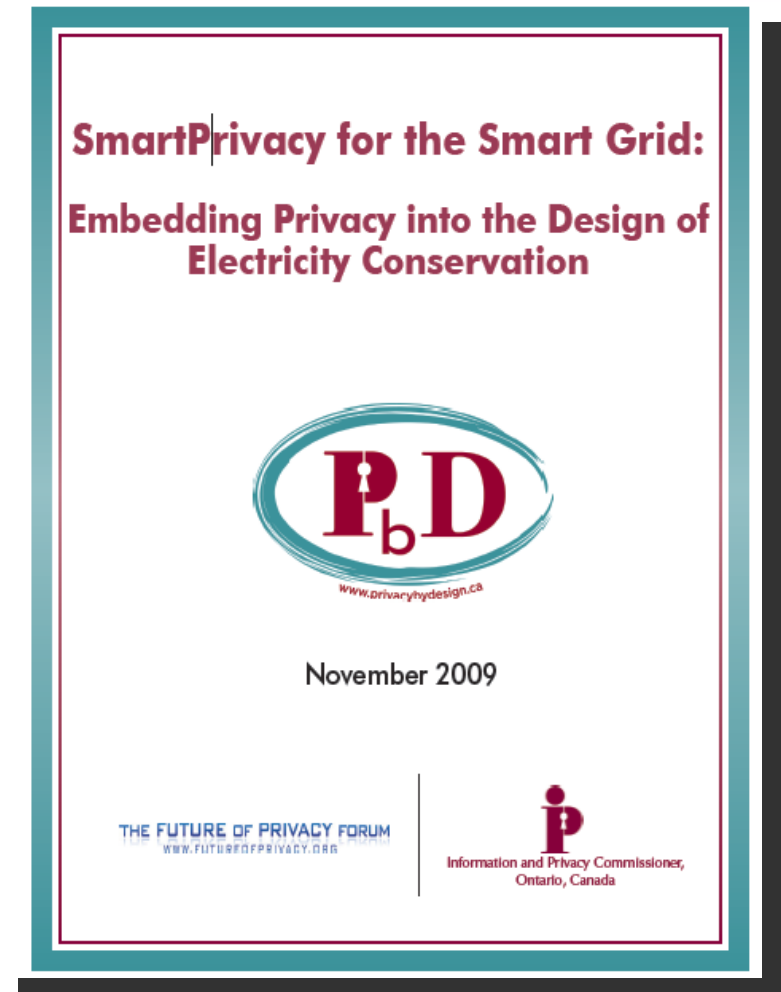


The Institute of Electrical and  
Electronics Engineers



U.S. National Institute of  
Standards and Technology

- Recently the Ontario Information & Privacy Commissioner of Ontario issued a report outlining their expectations for the broader set of smart grid technologies that might be deployed in this province.
- “The overarching privacy concerns associated with Smart Grid technology are its ability to greatly increase the amount of information that is currently available relating to the activities of individuals within their homes.”



- With the interconnectedness of the smart grid comes many similar security issues that are faced by the broader public internet:
  - More access points to common networks
  - More persons utilizing those networks beyond just the traditional utility companies
  - Disparate command and control authority over an every-widening array of grid components and systems.
- Security is front-and-centre in the current development effort already under way regarding smart grid interoperability standards
- But can't we get more reliability for less money as well if more information is passed more often

# Issue: The Environment and Public Policy Goals

- As noted in the *Green Energy Act*, the Smart Grid is seen as a key enabler of renewable energy deployment in the province of Ontario.
- In addition, the smart grid concept holds the potential for yielding environmental data about energy production and use which may be used to support future public policy initiatives such as a Cap and Trade monitoring system.



- The IESO Smart Grid Forum is in the process of creating a **Partners Committee** aimed at seeking private sector input on policy development and specific technical issues.
- Will include a broad spectrum of industry players.
- Opportunities for open access and dialogue with the Smart Grid Forum.
- Participation details will follow in the near future.

- The evolving nature of the smart grid is currently being shaped by:
  - **Public Policy:** In this respect, Ontario has made a bold move to foster smart grid development as part of the *Green Energy Act*.
  - **Technological Development:** The smart grid encompasses technological components that are still early in their development lifecycle, but will increasingly need to adhere to common interoperability standards in order to operate.
  - **Commercial Opportunity:** With empowered customers, comes a widening array of commercial products to support them, and the demands on the smart grid are just beginning to take form.

Thank you.