

Smart Grid – The Case for Ontario

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- The development of a Smart Grid is necessary to support government policies for clean, affordable, and reliable supply of electricity:
 - Integrate and accelerate the growth of renewable and distributed generation
 - Develop and implement efficient ways to consume electricity
 - Maximize opportunities to maintain affordable electricity costs
 - Improve reliability and security

- Ontario is in a unique position to evolve its existing infrastructures to a “Smarter” Grid
 - Ontario energy and environmental policies intrinsically recognize the societal benefits that arise from clean energy, renewable energy, conservation, and demand management.
 - Provincial goals for clean energy, renewable energy, conservation, and demand management are enormous both in terms of timing and quantity.
 - In meeting this challenge, integral aspects of the Smart Grid are currently being implemented.
 - Further development of the Smart Grid is a means to build on the benefits of Ontario’s current Smart Grid investments and leverage on other investments as well.
 - A progressive regulatory framework in Ontario is evolving “Smart Grid” policies.
 - There is potential for increased innovation, company building, export and employment opportunities in Ontario.

- Ontario energy and environmental policies intrinsically recognize the societal benefits that arise from clean energy, renewable energy, conservation, and demand management
 - It is the inclusion of societal benefits that makes the business case for the Smart Grid compelling.
 - The cost-benefit ratio which includes these societal benefits has been estimated to be 4 to 1.
 - Cost of environmental impact is large and growing and environmental benefits need to be factored in.

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 - Supply mix is changing:
 - Coal-fired generation which accounts for about 20% of our energy today is being phased out.
 - 80% of Ontario's existing generating capacity must be replaced over the next 20 years with some combination of reduced demand or new or refurbished generating capacity.
 - Peak demand is forecast to grow at a rate of 1% per year.
 - Aggressive conservation targets:
 - 6,300 MW reduction in peak electricity demand by 2025 with interim targets of 1,350 MW by end of 2007 and a further 1,350 MW by 2010.
 - Doubling of renewable energy capacity:
 - The current level of renewable supply in service will be doubled to 15,700 MW by 2025.
 - Upward pressure on the Global Adjustment

- In meeting this challenge, integral aspects of the Smart Grid are currently being implemented
 - Province-wide smart meter deployment:
 - Ontario has already made a substantial investment in smart meters, a key part of the smart grid.
 - This investment will be seen and felt by consumers increasingly as the deployment completes in 2010 leading to increasing awareness and demand options by consumers, e.g., smart consumers and environmental stewards
 - Communication infra-structures associated with the smart meter deployment are being put in place:
 - Communications is a foundational element of the smart grid
 - Increase in distributed generation:
 - Higher penetrations of distributed generation from OPA's RESOP contracts and Standard Offer programs are being incorporated into Ontario's distribution systems.

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 - Smart Meters:
 - Smartening customer premises
 - e.g., “smart house” pilot project is currently being deployed by Ontario local distribution company Milton Hydro and Bell Canada.
 - Hourly and time-of-use settlement
 - Electricity Markets:
 - Incorporation of customer demand response into the IESO-administered wholesale electricity markets
 - Participation in green energy markets
 - Transmission and Distribution Investments:
 - Opportunity to improve coordination to meet the province's changing needs.
 - Renewable and Distributed Generation
 - Alternative approach for oversight and control by system operators is needed
 - Potential for additional revenue streams, e.g., emissions credit; power quality for digital age

- A progressive regulatory framework in Ontario is evolving “Smart Grid” policies:
 - The OEB is looking into the following components of the regulatory framework:
 - Methodology to quantify Distributed Generation benefits
 - Distributed Generation connection standards
 - Time-of-use pricing
 - Smart meter funding

- Potential for increased innovation, company building, export and employment opportunities in Ontario:
 - Global marketplace leadership in manufacturing energy management systems already exists: Ontario based company S.A. Armstrong
 - Ontario Centres of Excellence have been created to develop new and improved technologies in such sectors as energy and information and communications. The Smart Grid is an opportunity for these two centres to support the research and development of smart technologies
 - OPA’s Technology Development Fund is providing investment funding for the development of smart technologies that can be brought more quickly into the Ontario marketplace.
 - Development and deployment of Plug-in Electric Vehicles builds on many of the Province’s competitive advantages:
 - An existing automotive manufacturing base
 - Relative low cost, reliable off-peak power for off-peak charging
 - Time-of-use pricing with smart meters encourages “filling up” during off-peak times
 - Large congested urban centres benefit from the efficiency of PEVs
 - Draw on the talent at educational centres for research