Ontario Energy Board
Commission de l'énergie de l'Ontario

Policy Guidance on Smart Grid Development

Renewed Regulatory Framework for Electricity Workshop

Presenter: Roy Hrab / Rachel Anderson

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Overview

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The Board's Approach to Smart Grid

- Minister's Directive to the Board on the Development and Implementation of Smart Grid
- Renewed Regulatory Framework for Electricity Distributors (RRFE)
- Supplemental Report on Smart Grid
- Updated Filing Requirements

Key Parts of the Renewed Regulatory Framework for Electricity Addressing Smart Grid

- Under an integrated approach, all categories of network investments will be planned together, including smart grid development and implementation
- Effective use of regional infrastructure planning and the inclusion of regional considerations in distributors' and transmitters' plans key to ensuring that development and implementation of smart grid in Ontario is carried out on a coordinated basis and made at the system level (distribution or transmission) that best serves the interests of the region
- Board intends to explore further opportunities to embed the facilitation and recognition of technological innovation in the renewed regulatory framework: Smart grid development and implementation activities will be a central focus of that effort
- Behind the meter services are a non-utility activity

Key Parts of the Supplemental Report on Smart Grid

- Sets out high level expectations to electricity distributors (and other regulated entities) with respect to investments to be considered when planning
  - Customer engagement of high importance for identifying areas for investment
  - Planned investments will be assessed against the Board's evaluation criteria
- Smart Grid Objectives:
  - Customer Focus
  - Power System Flexibility
  - Adaptive Infrastructure

Key Parts of the Supplemental Report on Smart Grid

- Customer Control:
  - Investment plans must demonstrate that distributors have undertaken activities to understand their customers' preferences (e.g., data access, participating in distributed generation, and load management) and how they have addressed those preferences
  - Provide information and education to customers regarding the potential benefits of smart grid
  - Investigate options for facilitating customer access to consumption data in an electronic format
  - As metering infrastructure is renewed and replaced over time, distributors must explore mechanisms that facilitate "real-time" data access and "behind the meter" services and applications for the purpose of providing customers with the ability to make decisions affecting their electricity costs

Key Parts of the Supplemental Report on Smart Grid

- Power System Flexibility
  - Regulated entities must demonstrate in their investment plans how they have incorporated necessary investments to facilitate the integration of distributed generation and more complex loads (e.g., customers with self-generation and/or storage capability).
- Investments may include: modeling and forecasting, system monitoring devices, control room automation

Key Parts of the Supplemental Report on Smart Grid

- Adaptive Infrastructure
  - Regulated entities must demonstrate in their investment plans that they have investigated opportunities for operational efficiencies and improved asset management, enabled by more and better data provided by smart grid technology
- Investments may include: data analytics tools that examine and identify energy theft, disturbances, outages

Key Parts of the Supplemental Report on Smart Grid

- Board will assess planned smart grid expenditures against policy objectives in Minister's Directive
  - *Efficiency, Customer value, and Reliability*
    - Core to Board's work
  - *Safety*
    - Part of good utility practice
  - *Cyber-security and Privacy*
    - Appropriate cyber-security and privacy standards being met
  - *Co-ordination and Interoperability*
    - Regional planning and interoperability as per RRFE
  - *Economic Development and Environmental Benefit*
    - Will be considered but not primary determinative criteria

Key Parts of the Supplemental Report on Smart Grid

- Smart Grid Advisory Committee established to provide further guidance to the Board on smart grid development and implementation
  - Initial focus on standard data access mechanisms, deployment of smart grid technology, cyber-security, and interoperability
  - Committee started meeting in July 2013
  - Working groups created to examine issues related to storage and low volume customer data access

Consolidated Distribution System Plan Filing Requirements (Chapter 5)

- Updated filing requirements reflect guidance and expectations from Supplemental Report
  - "5.0.3.4 Smart grid development and implementation"
    - "Under the renewed regulatory framework, smart grid development is expected to be integral to distribution system plans, a central focus of grid-enhancing innovation, and implemented on a coordinated regional basis to achieve economies of scope and scale…"

Updated filing requirements (5.0.3.4 cont.)

- "These filing requirements therefore include DS Plan information regarding, where appropriate:
  - the activities a distributor has undertaken in order to understand their customers' preferences (e.g., data access and visibility, participating in distributed generation, and load management) and how they have addressed those preferences;
  - the options a distributor has considered for facilitating customer access to consumption data in an electronic format;
  - the mechanisms that facilitate "real-time" data access and "behind the meter" services and applications that a distributor has considered for the purpose of providing customers with the ability to make decisions affecting their electricity costs;
  - the consideration a distributor has given to the investments necessary to facilitate the integration of distributed generation and more complex loads (e.g., customers with self-generation and/or storage capability);
  - the technology-enabling opportunities a distributor has considered regarding operational efficiencies and improved asset management; and
  - the distributor's awareness and adoption of innovative processes, services, business models, and technologies."

Updated filing requirements

- 5.4.5.2 B: “Evaluation criteria and information requirements for each project/activity”
  - Sets out the 10 evaluation criteria in the Minister’s Directive and Supplemental Report
  - “Efficiency, customer value, reliability and safety are the primary criteria for evaluating any material investment; other criteria pertaining specifically to grid modernization will be applied where applicable.” (e.g., cyber-security, interoperability, economic development, environmental benefits)

For non-CoS Filings

- Deferral accounts available for IRM filers
- Board has policies and processes to accommodate smart grid investments, pilots and demonstration projects and
  - Deferral accounts, rate adders, rate riders…

An example…

- **EB-2013-0141:** Hydro One 3rd Generation IRM Application
  - Also sought approval for establishment of a Smart Grid rate rider

- Smart Grid Expenditures included:
  - Customer Control: Consumer research; Continuing Demand Response pilot trialing home energy management system integration with utility demand response programs
  - Power System Flexibility: Distribution Management System; pilot dispatching both small and large distributed generators; pilots planned for integration of flywheel and battery energy storage
  - Adaptive Infrastructure: pilot a Conservation Voltage Reduction initiative; incorporate information from AMI to improve outage restoration and locate faults faster; analyze, on pilot basis, information from smart grid and smart meter systems to identify and reduce energy theft

- Board approved Settlement Agreement with rate rider to recover a 2014 revenue requirement of $29.3 million for OM&A and in-service capital costs of Hydro One's Smart Grid program (September 26, 2013)

EB-2013-0141: Hydro One's Smart Grid program

Supplemental Report on Smart Grid Objectives	Project	Scope of Work	Expected Benefit
Customer Control • Understand customers preferences • Provide information and education to customers • Facilitate customer access to consumption data	Consumer Research	Perform customer research to understand customer preferences and determine which smart grid technologies would be most beneficial for customers.	Obtain intelligence on customer preferences that will feed the requirements and design of the smart grid initiatives.
	Demand Response	Enable home energy management systems for Hydro One customers and make customer data securely available to third party applications (i.e. smart phone apps)	Help customers understand, control and reduce their electricity charges and enable more peak shaving capacity.
	Mobile Customer Discovery Centre	Build mobile event trailer containing interactive exhibits designed to engage and educate consumers on how the electricity system is becoming more productive and technologically-enabled to providing better service and reliability.	Increase customer's awareness of their electricity usage and demonstrate tools they can use to reduce their energy consumption
Power System Flexibility • Facilitate integration of distributed generation • Facilitate integration of complex loads (e.g. customers with self-generation and/or storage capabilities	Distributed Generation Dispatch	Pilot dispatch (on/off/up/down) of both small and large distributed generators ("DGs").	Provide operational control of DGs for both local planned outages as well as avoidance of surplus base load generation at the system level.
	Distribution Management System Enhancements	Update DMS software and infrastructure to support expansion of DMS.	Provide further integration of smart grid capabilities into the central control system for operators.
	Energy Storage Integration	Pilot both battery and flywheel energy storage technologies and integrate into DMS.	Incorporate energy storage into distribution operations to provide voltage regulation and absorb excess energy to integrate DG more effectively.
	Validation of Smart Grid Technologies and Processes*	Conduct technical, operational and economic validation of all of the Phase 1 Release 1 delivered technologies.	Allow for planning the eventual smart grid deployment programs, ensuring prudent investments for Hydro One customers.

EB-2013-0141: Hydro One's Smart Grid Program

Supplemental Report on Smart Grid Objectives	Project	Scope of Work	Expected Benefit
	Infrastructure Support	Other ancillary project support functions such as communications, program management, process design and training development.	Support the delivery of individual projects.
Adaptive Infrastructure • Investigate opportunities for operational efficiencies • Investigate opportunities for improved asset management • Leverage the data provide by smart grid technology	Advanced Metering Infrastructure for Operations	Enhance outage management system to utilize the real time power outage notifications from customer smart meters and provide the ability to confirm outages to the control centre.	Improve time to restore outages and improve efficiency handling trouble calls.
	Conservation Voltage Reduction	Pilot flattening and lowering voltage profile on feeders to reduce losses on lines and energy use by consumers.	Reduce customers' energy consumption and manage voltage issues associated with DG and lower the line loss adjustment charged to customers.
	Energy Theft & Analytics	Build an analytical system that examines meter and operational data to identify energy theft.	Identify and reduce energy theft, lowering the line loss adjustment charged to customers.
	Mobility Solutions	Provide mobile versions of smart grid applications for piloting.	Empower field crews with more information to increase efficiency and speed restoration
	Smart Grid Deployment	Install additional smart grid devices (e.g. sensors, reclosers, intelligent electronic devices, remote control switches).	Improve reliability and situational awareness of the distribution system.
	Infrastructure Support	Other ancillary project support functions such as communications, program management, process design and training development.	Support the delivery of individual projects.

Summary

- Grid modernization is expected to be demonstrated in applications
- The Board recognizes that there is a diversity of circumstances among distributors and is not prescribing specific investments and technologies
- In order to have expenditures approved, applications must demonstrate that the expenditures are consistent with the evaluation criteria set out by the Board

The investments in your application need to have fit your circumstances, be supported by your customers, enhance your system and deliver value

to your customers

Questions…..

Thank you

Need information?

Submit your enquiries via Email:
market.operations@ontarioenergyboard.ca