



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

Smart Grid | the regulatory perspective

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| outline

- regulation basics
- *smart grid*
 - definition
 - key characteristics
- potential regulatory challenges
- recent experience with similar regulatory issues
 - smart meters
 - conservation and demand management
 - renewables
 - rules & codes
- looking ahead
- questions & discussion



| regulation basics

- the objectives of the Board's regulation are
 - to protect the interests of consumers (rates and quality of service)
 - to promote economic efficiency and cost effectiveness, and facilitate the financial viability of the electricity industry
- good utility regulation aims to
 - ensure efficient pricing of monopoly services
 - maximize predictability
 - facilitate the implementation of government policy
 - create an environment of compliance
- using processes that
 - are transparent and open
 - examine the prudence of costs vs. benefits
 - assess the allocation of costs and benefits (cost causality)



| *smart grid (n.)*

- distribution and transmission networks integrated using interconnected devices and systems including:
 - robust two-way communications
 - advanced sensors, and
 - dispersed computer systems
- potential benefits:
 - CDM: reduced power consumption during peak hours
 - DG: facilitates Dx and Tx connection and operation of photovoltaic arrays, wind turbines, micro hydro, CHP, energy storage facilities
 - Safety/Reliability: adaptive network failure response capability
 - Cost savings: higher efficiency; lower losses; fewer/shorter outages, etc.
 - Environment: reduced CO₂ and other fossil fuel emissions by enhancing contribution of connected renewables
- potential costs and sources of risk:
 - ?



| key characteristics

- *smart grid* encompasses a wide variety of devices and interconnected systems that
 - may yield multiple functions or ‘joint products’
 - not necessarily at the same time
 - not necessarily all strictly energy related
 - function benefits may be unevenly distributed
 - individual customers
 - customer classes
 - distributor service areas
 - ‘society’ as a whole
 - other service providers and commercial entities



| regulatory challenges of smart grid

- main issues for regulatory assessment of smart grid investment
 - prudence: assessing costs vs. benefits
 - causality: appropriate allocation of costs



smart meters |

combine direct customer with broader 'societal' benefits

- indirect 'societal' benefits are recognizable
 - smart meter enabled CDM by individual customers can lower market prices for all customers, even those without SMs
- the Board directed authorized distributors
 - that had yet to undertake SM spending to “jumpstart” their programs with an SM rate ‘adder’;
 - to apply new SM charges to customers before their SM was installed; and
 - to recover SM costs through rates on an ‘as spent’ basis
 - smart meters may become part of a communication network that has ancillary benefits related to DG



CDM |

regulation evolved to recognize an emerging distributor role...

- as distributors became more engaged in CDM activities, the Board developed and refined a regulatory framework for considering distributor applications to recover CDM costs in rates (and through LRAM/SSM)



CDM |

...and to reflect policy emphasis on societal benefits

- OPA funding of CDM programs through the Global Adjustment Mechanism recognizes the ‘societal’ benefits of sustained CDM
 - recovery through distribution rates is being replaced by broad-based funding
 - the benefits of some smart grid investments have similar characteristics



renewables |

the challenge of Tx 'enabler' lines for renewables...

- currently, Tx must invest in (and all customers pay for) *shared* network facilities whenever demand growth or reliability concerns warrant it
- generators are responsible for the cost of connections
- 'enabler' Tx lines to accommodate renewables may not meet conventional criteria for utility investment
 - high costs, time lags and uncertainties can impede the development of individual projects



renewables |

... may require an innovative regulatory approach

- a recent Board proposal for Tx ‘enablers’
 - transmitters can construct enabler facilities to connect generators
 - each connecting generator makes a pro-rated capital contribution to cover their share of the cost
- will new approaches be needed for analogous smart grid-based ‘enabler’ assets?
- are new cost recovery mechanisms needed?



rules & codes |

smart grid - a platform for commercial activities

- what are the respective roles of the distributor, its affiliates and independent service providers?
- distributor affiliates may provide a variety of competitive services to customers
- smart grid investments recovered in rates may enable additional investment in assets with competitive commercial potential
- what information should be accessible to affiliates and other service providers?



looking ahead | cost causality in rate recovery

- distributor investment plans will benefit from
 - capturing direct life-cycle benefits of smart grid investment for customers
 - and distinguishing between
 - direct vs. indirect benefits/beneficiaries
 - service territory vs. societal benefits
 - non-commercial vs. commercial opportunities
- regulation may need to consider
 - new approaches to funding investments
 - new approaches to reviewing investment plans
 - new categories of customer charges
 - new rules around who can do what



looking ahead | the role of regulated utilities as 'enablers'

- multi-purpose systems may blur the distinction between regulated and unregulated assets
- given bundled functionality, how can implicit subsidies of commercial activities using assets funded through rates be addressed?



Questions | Discussion

