The Role of Climate Change Policy and Energy Efficiency on Natural Gas Distribution System Design

Presented by: Suzette Mills, Integrated Planning Specialist, Enbridge Gas Distribution
The New Enbridge

- 4th largest company in Canada
- Operates the longest crude oil transportation system in the North America
- Operates Canada’s largest energy distribution companies: Enbridge Gas & Union Gas: serve consumer markets in Ontario, Quebec & New Brunswick and New York
- Canada’s second largest investor in renewables (wind, solar, hydroelectric, geothermal etc.)
Enbridge in Ontario

- Delivers 95% of Ontario’s Natural Gas
- We deliver about 37% of Ontario’s total energy use each year
- Over 165 years of experience in safe and reliable service
- The Sarnia-area Dawn Storage Hub is Canada’s largest and one of the top-5 natural gas trading hubs in North America
- Natural Gas Rural Expansion: $100M expansion program to add rural communities and economic development projects

Natural Gas
3.5 M customers, heating more than 75% of Ontario homes, through two utilities

Renewables
7 projects: wind, solar and hydroelectric (490 MW).

Infrastructure
~$14 billion (2016) between Enbridge Gas Distribution and Union Gas

Employment
Over 4,500 Ontario-based permanent and temporary staff.
Background IRP Policy development in Ontario

2013
- Ontario Ministry of Energy – LTEP
- Ministers Directive

2013
- Enbridge’s GTA project

Early 1990’s
- OEB EBO 169 III

2015
- DSM Multi-year Plan Framework

2016
- OEB Decision in the DSM Multi-year plan
Background Carbon Policy development in Ontario

Ontario Energy Board

- Climate Change Act (May 2016)
- C&T Regulation (July 2016)
- OEB C&T Framework (Sept 2016)
- GHG Reporting and Forecast of Obligation
- NG Utilities’ Compliance Plans Due (Nov 2016)

- Next Compliance Plan due November 2017
- Annual Monitoring Reports to be filed
Climate Change Policy in Ontario

- Cap and trade is part of Ontario’s Climate Change Strategy “designed to help fight climate change, and reward businesses that reduce their greenhouse gas emissions.” Government of Ontario
Ontario’s Climate Policy and Cap and Trade Continuous Cycle

- Drives actual GHG reductions through implementation and disbursement of funds
- Influences ON energy pathways
- Informs Enbridge’s activities

- Includes DSM, Low Carbon Tech, Facility Abatement and/or LT Investment

- Collects revenues from Cap and Trade
- How the money will be spent to meet targets outlined in Act

- GHG verified #s
- Net of abatement
- Price Signals

- Market implementation of EE and Low Carbon Initiatives

- Policy, Climate Change Action Plan & the ‘GreenON’

- Compliance Plan

- Enbridge’s abatement initiatives

- Informs Enbridge’s activities
Climate Policy and Programming

Impacts

Creates Integrated Planning Imperative

DEMAND

SUPPLY

IRP
# Climate Change Policies and Integrated Resource Planning

## Heightened importance of coordinating climate change policy goals and infrastructure investments:

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Impact</th>
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<tr>
<td>Increasingly higher Carbon Pricing costs coupled with Natural Gas Energy Efficiency = declining average gas usage</td>
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<td>EE technologies – Adaptive thermostats = decrease annual consumption with a potential increased peak hour demand</td>
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<td>Increased electrification of energy systems that may requiring higher amounts of new generation infrastructure at a time when nuclear is being retired = increased natural gas demand</td>
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<td>System expansion initiatives into rural communities to provide relief to rural electric ratepayers + new natural gas customer additions = expanded natural gas infrastructure</td>
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<td>NGV + Increased Green Vehicle penetration = increased natural gas throughput</td>
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<td>All of these scenario’s have an unknown effect at this time on a natural gas distribution system</td>
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Integrating IRP and Infrastructure Planning

Utilities:

Consultant:

- Theoretical study coupled with long term case studies in both utility jurisdictions
- Transition Plan on how the utilities will integrate and coordinate infrastructure and energy efficiency planning
Enbridge / Union Gas – IRP Study Scope of Work

Is examining the three areas where Energy Efficiency and Demand Response could potentially impact infrastructure planning:

• Broad-based energy efficiency impacts and planning forecasts of infrastructure investment (Passive Deferral)
• Potential direct impact of energy efficiency on subdivision planning (New System Design)
• Potential direct impact through targeted energy efficiency and demand response to achieve deferral of reinforcement projects (Active Deferral).
IRP Study Scope

- Study will consider whether the implementation of energy efficiency may be used to defer existing infrastructure.
- Recognize that Integrated Resource Planning may in time consider many energy solutions, including looking at scenarios that provide cost effective, safe and reliable energy while also considering carbon impacts.
- In the future this could include a review of a variety of different low carbon options such as:
  - expanded energy efficiency to defer existing regional and local infrastructure;
  - the impact of net zero ready subdivisions;
  - distributed energy resources;
  - community energy planning,
  - and the least cost lowest carbon solutions.
IRP Study Process

Includes:

• Review of industry practices
• Assessment of DSM impacts on peak period requirements
• Review of utility facilities planning
• Transition plan
• Avoided costs
• DSM impacts to infrastructure
Preliminary findings

**Enbridge Gas Distribution**
Comparison of Relative Contribution to Peak Period #1

- **Residential** sector accounts for 47% of the peak demand in peak periods #1
- **Commercial** sector also accounts for 47% of the total in peak periods #1

**Union Gas**
Comparison of Relative Contribution to Peak Period #1

- **Commercial** sector accounts for 38% of the peak demand in period #1,
- **Industrial** sector accounts for 28% of the peak demand in period #1
Preliminary Findings - technologies

• Most energy efficiency technologies decrease annual savings and have a corresponding decrease to peak hour savings,

• However, not all of these technologies decrease peak hour,

• Much more definitive study is still required to fully understand the impacts of these technologies.
Tankless Water Heaters – Aggregate Profligate Profile (5 min Resolution)
Tankless Water Heaters – Aggregate Profligate Profile
(1 hour Resolution)
- No increases to peak are visible at a 1 hour resolution
Future considerations

Key considerations:
- Interplay between carbon and infrastructure planning
- Changes in the approval process for Infrastructure targeted DSM
- Allocation of risk
- Equivalent rate of return
- Cross-subsidization
- Incentives for non-general services customers
- Establishment of an appropriate Leave-to-Construct (LTC) budget threshold for Geo-Targeted DSM programs
- Appropriate cost effectiveness test
- New business models for energy efficiency
Case Study - Deep River, Ontario
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