Integrating Conservation & Demand Management into Distribution Operations

Tuesday, October 15th, 2013
Agenda

1) THESL at a Glance
2) Regulatory and Asset Management Environment
3) CDM Evolution
4) CDM Integration Strategy
5) Policy Environment
Toronto Hydro at a Glance

- Largest municipal electricity distribution company in Canada serving a city of 2.5 million people.
- Distributes approximately 18% of the electricity consumed in Ontario.
- Approximately 719,000 accounts servicing 934,000 customers.
- Peak Load of 5,000 MW.
64% of Revenue paid by 1.8% of Customers

<table>
<thead>
<tr>
<th>Customer Segment</th>
<th>Revenue ($M)</th>
<th>Customers</th>
<th>Revenue Per Customer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Business &gt;1,000 kW</td>
<td>$705</td>
<td>556</td>
<td>$1,268,562</td>
</tr>
<tr>
<td>Medium Business 50-1,000 kW</td>
<td>$1,089</td>
<td>12,225</td>
<td>$89,057</td>
</tr>
<tr>
<td>Small Business &lt;50 kW</td>
<td>$298</td>
<td>67,970</td>
<td>$4,377</td>
</tr>
<tr>
<td>Residential &lt;50 kW</td>
<td>$710</td>
<td>637,910</td>
<td>$1,113</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$2,801</strong></td>
<td><strong>718,661</strong></td>
<td></td>
</tr>
</tbody>
</table>
Agenda

1) THESL at a Glance
2) Regulatory and Asset Management Environment
3) CDM Evolution
4) CDM Integration Strategy
5) Policy Environment
Regulatory Environment

Cost of Service
- To 2001
  - Annual review of Operating and Capital Expenses to set rates
  - LDC evidence tested through a public hearing process with Intervenors

Incentive Regulation + Incremental Capital
- 2012-2014
  - Rates set by formula
  - Operating expenses are fixed less a productivity factor
  - Incremental capital is required to maintain asset renewal program; specific projects must be justified through the hearing process

Custom Incentive Regulation
- 2015-2019
  - Rebase of OpEx and CapEx in 2015
  - Regulatory goal of giving customers rate certainty for a 5 year period
  - Risk to LDC of fixed budgets
  - Opportunity for LDC to present evidence for unique needs for funding beyond the base formula
Load Intensification

The pace of growth is anticipated to continue in Toronto.

*Includes highrise and other equivalent large construction projects
Almost 40% of outages in Toronto are due to aging equipment.

Thanks to our capital investment in infrastructure, equipment-related outages are down 10% since 2009.
THESL Distribution Capacity Pressures

Upgrades are in-progress or planned to address station bus capacity in specific areas over the next 10 years

Legend
- Load Relief Required in 2013 - 2017
- Load Relief Required in 2018 - 2022
- No Load Relief Required within 10 Years
Agenda

1) THESL at a Glance
2) Regulatory and Asset Management Environment
3) CDM Evolution
4) CDM Integration Strategy
5) Policy Environment
2005 - 2014 CDM – Demand Savings (MW)

- **2005 - 2007**
  - OEB 3rd Tranche
  - on/off peak, “gross” results

- **2007 - 2010**
  - OPA Standard Programs
  - on/off peak, “gross” results
  - Growing market focus on Commercial & Industrial

- **2011 - 2014**
  - OPA Province-Wide Programs
  - Summer peak, “net” results
  - All market sectors

- **2015 onward**
  - ??

Conservation Culture (Low Persistence)

Increased integrity/credibility of peak MW have evolved

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forecast</td>
<td>?</td>
<td>?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Estimated CDM Impact on System Peak

System Summer Peak Demand

~300 MW Equivalent to Thunder Bay Coal Generation Plant

Reduction = Load Growth
- Conservation
- Standards
- Demand Response
+/-Economic Factors

Load growth of 1.5%
Current CDM Program (2011 – 2014)

- Green Energy Act
- OEB CDM Code
- Mandatory Reduction Targets

- Consolidation of Delivery Channels “LDC Prime”

Summer Peak Demand

- 286 MW
- 1044 MW

Annual Consumption

- 1300 GWh
- 4700 GWh

Lakeview: 1050 MW
Agenda

1) THESL at a Glance
2) Regulatory and Asset Management Environment
3) CDM Evolution
4) CDM Integration Strategy
5) Policy Environment
CDM Integration Strategy

The future of CDM needs to be designed to:

• leverage and enhanced customer relationships that will evolve into a long term partnership
• reduce electricity use and help customers manage rising rate pressure and maintain competitiveness
• provide data and tools for analysis, investment decisions and reporting
• used to add new customer load while managing system peak demand and load constraints
• provide effective programs to help defer traditional investment in asset expansions and ease the pace of rate increases
• harness customer energy assets to used for DM and DR to improve operational flexibility during peak and major outage
Demand Management & Response

On July 9th, 2013, 300,000 customers experienced outages when record rainfall caused flooding at Mandy Transformer Station. Toronto Hydro effectively relieved resulting stresses on the grid with Demand Response programs.

Total System Loading – July 9, 2013

Emergency PeakSaver & DR3 curtailments called due to Manby flooding (approx. 100 MW reduction)
Integration Illustration Example

Station X - Impacted BUS

<table>
<thead>
<tr>
<th>Offset</th>
<th>DM /DR ($M/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 MVa</td>
<td>0.4 to 0.9</td>
</tr>
<tr>
<td>7 MVa</td>
<td>0.6 to 1.2</td>
</tr>
</tbody>
</table>

8 hours = 5% 4MVa
24 hours = 8% 7MVa

Station X - 4 MVa 103% Capacity Cost $80M
Rate Benefit Positive
Agenda

1) THESL at a Glance
2) Regulatory and Asset Management Environment
3) CDM Evolution
4) CDM Integration Strategy
5) Policy Environment
Policy Environment and Need for Change

- LDC investment in smart grid can be further leveraged for improved system operation and customer integration
- Large Customers need both high reliability and price predictability to remain competitive
- Adapt current framework to allow the distributor to target customer segments or sections of a distribution network, to realize benefits at a local level
Disclaimer

The information in these materials is based on information currently available to Toronto Hydro Corporation and its affiliates (together hereinafter referred to as “Toronto Hydro”), and is provided for information purposes only. Toronto Hydro does not warrant the accuracy, reliability, completeness or timeliness of the information and undertakes no obligation to revise or update these materials. Toronto Hydro (including its directors, officers, employees, agents and subcontractors) hereby waives any and all liability for damages of whatever kind and nature which may occur or be suffered as a result of the use of these materials or reliance on the information therein. These materials may also contain forward-looking information within the meaning of applicable securities laws in Canada (“Forward-Looking Information”). The purpose of the Forward-Looking Information is to provide Toronto Hydro’s expectations about future results of operations, performance, business prospects and opportunities and may not be appropriate for other purposes. All Forward-Looking Information is given pursuant to the “safe harbour” provisions of applicable Canadian securities legislation. The words "anticipates", "believes", "budgets", "could", "estimates", "expects", "forecasts", "intends", "may", "might", "plans", "projects", "schedule", "should", "will", "would" and similar expressions are often intended to identify Forward-Looking Information, although not all Forward-Looking Information contains these identifying words. The Forward-Looking Information reflects the current beliefs of, and is based on information currently available to, Toronto Hydro’s management. The Forward-Looking Information in these materials includes, but is not limited to, statements regarding Toronto Hydro’s future results of operations, performance, business prospects and opportunities. The statements that make up the Forward-Looking Information are based on assumptions that include, but are not limited to, the future course of the economy and financial markets, the receipt of applicable regulatory approvals and requested rate orders, the receipt of favourable judgments, the level of interest rates, Toronto Hydro’s ability to borrow, and the fair market value of Toronto Hydro's investments. The Forward-Looking Information is subject to risks, uncertainties and other factors that could cause actual results to differ materially from historical results or results anticipated by the Forward-Looking Information. The factors which could cause results or events to differ from current expectations include, but are not limited to, the timing and amount of future cash flows generated by Toronto Hydro's investments, market liquidity and the quality of the underlying assets and financial instruments, the timing and extent of changes in prevailing interest rates, inflation levels, legislative, judicial and regulatory developments that could affect revenues, and the results of borrowing efforts. Toronto Hydro cautions that this list of factors is not exclusive. All Forward-Looking Information in these materials is qualified in its entirety by the above cautionary statements and, except as required by law, Toronto Hydro undertakes no obligation to revise or update any Forward-Looking Information as a result of new information, future events or otherwise after the date hereof.