

Operational Perspectives on Ontario's TOU initiative

Presented by: James Douglas and Paul Frost

April 5, 2013



- Introduction
- Ontario pre-TOU
- Goals of the mandate
- Utility Implementation Challenges
- Ontario post-TOU
- Privacy

> Util-Assist Introduction

Assist utilities by operating in the middle ground between vendors and customers in the electric, water and gas utility industries.



Mission

- Provide simple solutions to complex problems
- Break down complicated information into manageable pieces
- Provide clients with straightforward results and clear direction

$$\frac{x(x-1) = x^2 - x}{1+1=2}$$

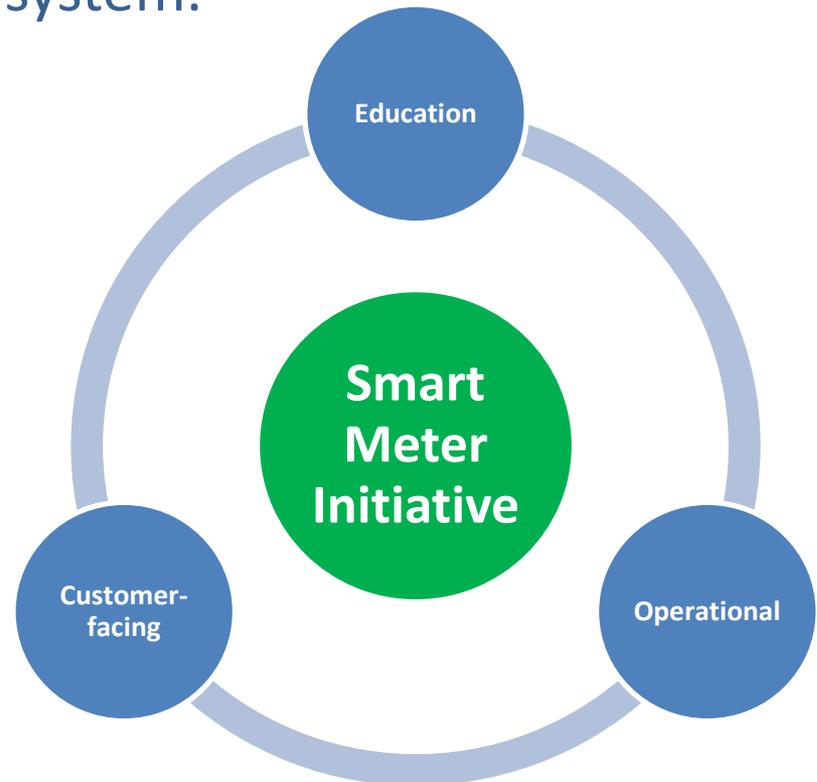
- Prior to 2003, Ontario's electricity system was weakening and unreliable, losing 1,800 MW between '95 and '03
 - Energy infrastructure crumbling; a shortage of supply caused risks of brownouts.
- Reliance on coal meant that electricity sources were polluting and dirty.
- Brief deregulated pricing experiment in '02 resulted in sharply increased prices, prompting government to freeze consumer prices.

1. Reduce peak electricity requirements through a combination of conservation and rate structure incentives
2. Implement 2-way Smart Metering by 2008
3. Time of Use billing by 2010
4. Peak reduction and reduction of greenhouse gases
5. Assist in building a Culture of Conservation
 - Energy efficiency is a cornerstone of the province's Long-Term Energy Plan, and an important element of Ontario's climate change strategy.

> Implementation Challenges

Ontario introduced smart meters along with a TOU electricity price structure to help customers manage their electricity costs, while helping Ontario to build a more efficient, more environmentally sound electricity system.

To achieve these goals, utilities were faced with a number of infrastructure-related challenges.



First they had to implement **Smart Meters**

- Knowing when electricity is used allows for the introduction of TOU rate structure and gives customers a new way to manage and reduce costs.
- Smart meters are a tool – rate design allows you to get shifting and reduction.



By implementing Smart Meters, utilities had to implement Meter Data Management (**MDM**) solutions.

- **Goals of an MDM**

- Provide analytical tools to aid in operational efficiencies
- Act as the system of record (SOR) for billing determinants
- Manage AMI data and act on it in an automated fashion

- **MDM in Ontario**

- MDM/R – Provincially managed
 - Billing
- ODS – Operational Data Store
 - Operations



Implementing MDM solutions required **CIS** upgrades for synchronization and other functionality

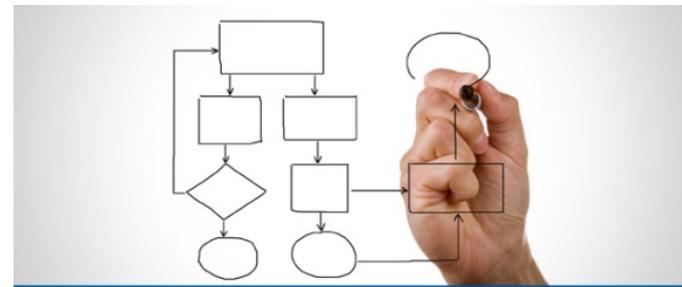
- **Billing changes (TOU)**
 - CIS required to support a new Billing SOR, the MDM.
 - Re-engineering of bill print process
- **Synchronization and Systems integration**
 - CIS (SOR for account data) required to participate in daily data synchronization processes with other systems
 - Sync strategy development
 - Integration (i.e., SO)



A close-up photograph of a utility bill. The bill is tilted and shows several lines of text. On the left, there are labels for 'Meter Readings' and 'Current'. The 'Current' reading is '22468'. Below this, there are several lines of text with 'x' symbols, likely representing rates or multipliers: 'KWH x 1185000', 'KWH x .0096400CR', 'KWH x .0008200', 'KWH x .0004100', and 'KWH x .0055200'. On the right side, there are several numbers: '175.5', '14.28', '1.21', '1.61', '8.18', '10.00', and '9.07'. The text is slightly blurred, but the overall structure is clear.

Implementing all of these systems, utilities were forced to address **Change Management**

- **Business Process**
 - Initiative required the development of new business processes
 - Don't underestimate Business Process redevelopment
- **Change management**
 - Challenge is process implementation
 - Management and Vendor sign-off
 - Training
 - Annual process management



Key challenge to eliminate fear of unknown regarding Smart Metering, TOU and other Provincial initiatives.

- **Goal**

- Equip customers to be able to adapt, understanding that if you don't, the result is negative feedback.

- **Strategy**

- Educational programs and opportunities for Customers
- Customer Tools
 - Web-based
 - Conservation Programs
 - Presentment options



Fundamental tools missing to maximize customer uptake.

- Bill presentment
- Home energy management
- Online tools
- Web presentment
- Conservation programs

PowerStream Communication

February (sample data)

Regulated Price Plan (RPP) Time-of-Use Charges

	Usage(kWh)	Rate	
On-peak	224.65	\$0.099	\$22.24
Mid-peak	152.92	\$0.081	\$12.39
Off-peak	463.21	\$0.051	\$23.62
Sub total			\$58.25

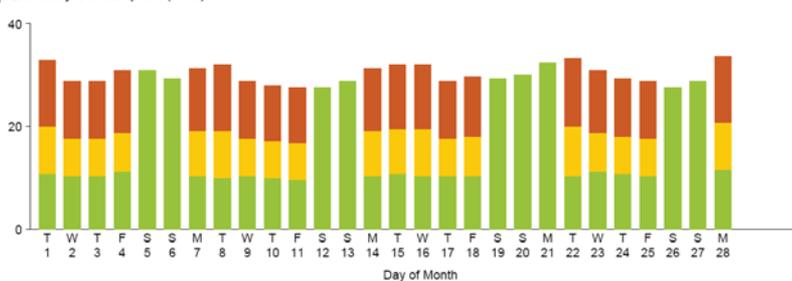
Regulated Price Plan (RPP) Charges

	Usage(kWh)	Rate	
	840.78	\$0.064	\$53.81

Comparison

Variance			\$4.44
----------	--	--	--------

Electricity Consumption (kWh)



January (sample data)

Regulated Price Plan (RPP) Time-of-Use Charges

	Usage(kWh)	Rate	
On-peak	249.43	\$0.099	\$24.69
Mid-peak	174.15	\$0.081	\$14.11
Off-peak	563.78	\$0.051	\$28.75
Sub total			\$67.55

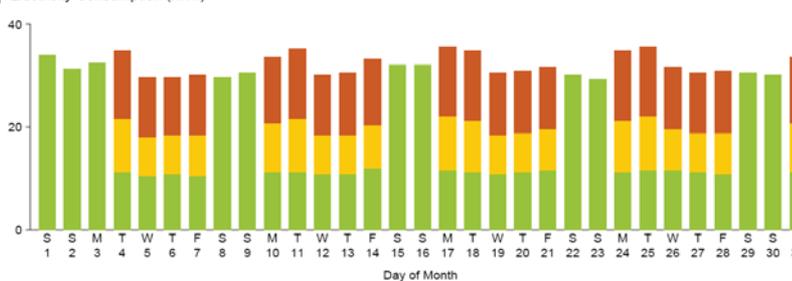
Regulated Price Plan (RPP) Charges

	Usage(kWh)	Rate	
	987.36	\$0.064	\$63.19

Comparison

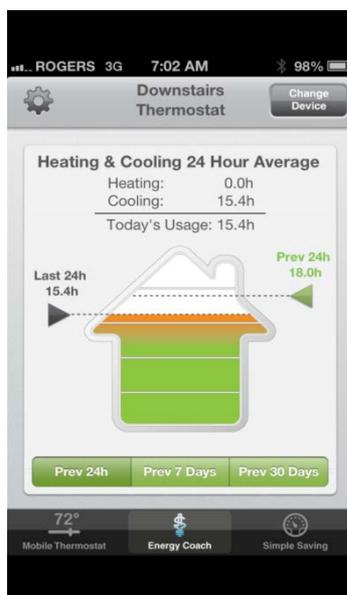
Variance			\$4.36
----------	--	--	--------

Electricity Consumption (kWh)



Utilities evaluating and implementing new energy management tools.

- Customers can better manage energy use based on TOU prices



10 Smart Meter Lane - <http://www.ieso.ca/house/>

House at 10 Smart Meter Lane is an interactive web tool that shows customers the effect of TOU rates as they use appliances, lighting and air conditioning at different times of the day.



Tools enable customers to view their consumption patterns over the Internet and empower them to make informed decisions about energy conservation.



Conservation programs provide customers with opportunities to manage the amount of energy they use throughout their home or business.

- Information available when programs launched by OPA
- Sample electricity conservation programs
 - CFL change out programs
 - Seasonal LED exchanges
 - Refrigerator buy-backs
 - Smart meters



- On track to building a clean, reliable electricity system.
- Conservation efforts have been working
 - Conserved more than 1,700 MW since '05
- On track to eliminate coal by 2014 (largest GHG reduction measure in North America)
 - Reduced use of coal by 70%.
 - Last year GHG emissions from the electricity sector reached the lowest in 45 years.
 - In '09 >80% of generation from emissions-free sources like wind, water, solar, biogas and nuclear.

- Long-Term Energy Plan
 - Ontario set one of the most ambitious energy efficiency goals in North America: 7,100 MW by 2030, equivalent of taking more than 2.4 million homes “off the grid”.
- Between now and 2025, Ontario will replace about 80% of its electricity system.
 - Building new generating facilities
 - Refurbishing current facilities
 - Investing in conservation and energy management tools so that less new electricity generating capacity is required

> A word about Privacy and Security

- Privacy and network infrastructure concerns raised include the possibility of:
 - Monitoring a consumer's usage,
 - Modifying one's own, or another consumer's usage,
 - Interrupting the power of one or more consumers,
 - Tampering with DSM tools controlled through smart meters.
- Impact of Privacy or Security breach
- Considerations
 - Who is responsible for security at your utility?
 - Security Audits ensure proper configuration for secure deployment
 - Who is responsible for privacy at your utility?
 - Privacy resources – Dr. Ann Cavoukian and Privacy by Design (PbD)



Image Courtesy of Elster

Discussion and Questions

> Websites to learn more

Electricity Pricing and Rates

<http://www.ontarioenergyboard.ca/OEB/Consumers>

Smart Meters

<http://www.energy.gov.on.ca/en/smart-meters-and-tou-prices/>

Conservation Tips

<https://www.torontohydro.com/sites/electricsystem/electricityconservation/powerwise/Pages/default.aspx>

Residential and Commercial Conservation Program Information

<https://saveonenergy.ca/>



James Douglas
jdouglas@util-assist.com
905.952.0477 ext. 201

Paul Frost
pfrost@util-assist.com
612.839.3834