

The Power of Smart Metering

Capgemini Teams with Hydro One to Meet Aggressive Energy Conservation Goals

The Situation

Hydro One Networks Inc., wholly owned by the province of Ontario, delivers electricity to 1.3 million end-users, municipal utilities and large industries.

To meet the growing needs of the province, Ontario must build an almost entirely new electricity system by 2025. Estimates show that over the next 20 years, Ontario will need to refurbish, rebuild, replace or conserve 25,000 megawatts of generating capacity—more than 80 percent of Ontario's current electricity generating capacity—at an estimated cost of \$70 billion CAD.

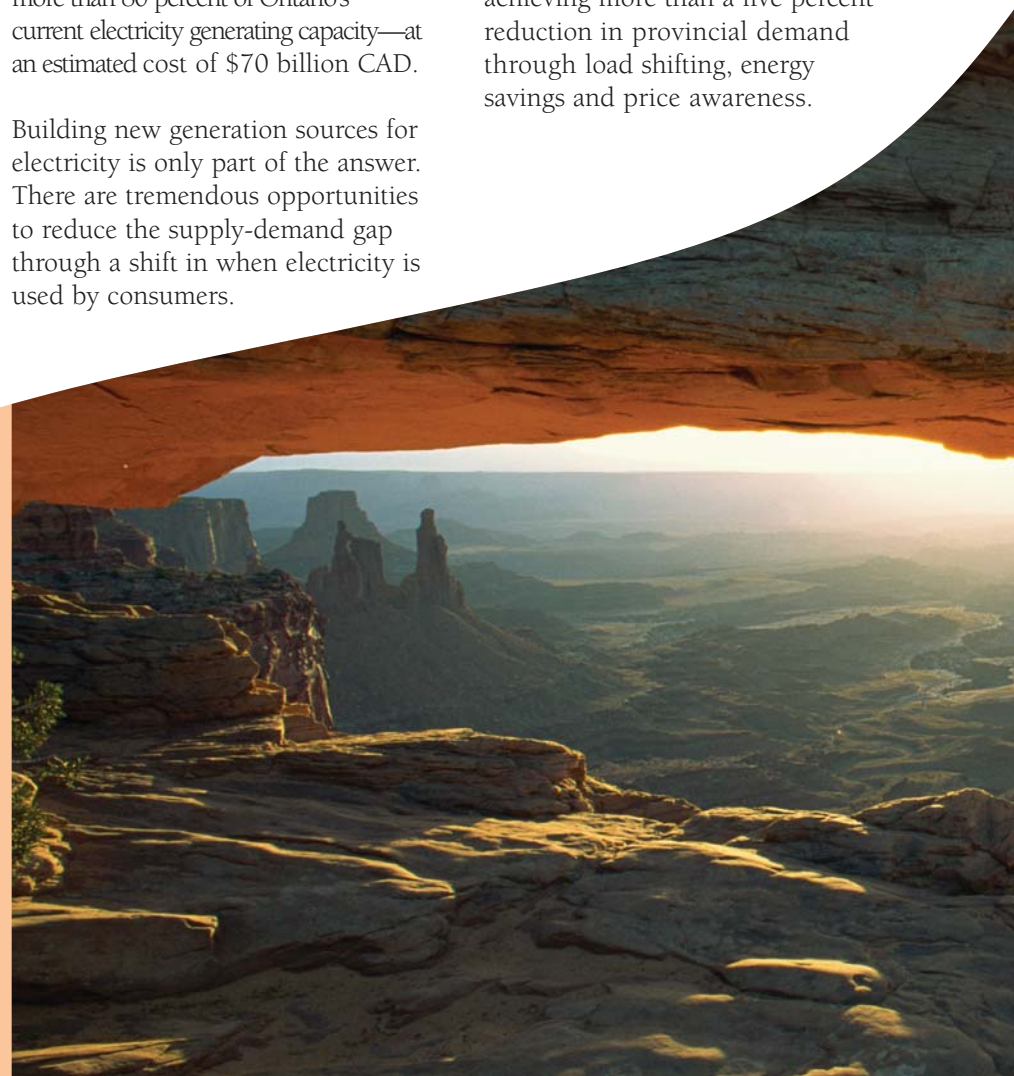
Building new generation sources for electricity is only part of the answer. There are tremendous opportunities to reduce the supply-demand gap through a shift in when electricity is used by consumers.

By introducing advanced metering infrastructure (AMI) and time-of-use (TOU) rates—charging higher rates during peak demand hours and lower rates at night and other off-peak times when there is a surplus of electric generation capacity—consumers will have an incentive to shift their consumption patterns in terms of when and how they use electricity.

For Ontario, this new infrastructure will provide a foundation for achieving more than a five percent reduction in provincial demand through load shifting, energy savings and price awareness.

“We are implementing the most capable AMR solution ever deployed to more than one million meters.”

Rick Stevens
Director, Development Strategies
Hydro One Networks Inc.



The Solution

Taking the utility leadership role in advancing this technology and supporting the provincial government's goal to have a smart meter in every Ontario home and small business, Hydro One compiled a dedicated team, beginning in 2005, by developing and testing the processes, tools and network infrastructure to support the mass deployment of unified, AMI-enabled smart meters in 2007 through 2010.

The mission statement and description for the project was to deploy a smart metering/network solution that meets the Ministry of Energy's requirements at the lowest possible cost and to be an enabler for other business processes and transformations. Objectives were to:

- Deploy smart meters across the residential and small commercial customer base
- Build enabling communications network and infrastructure
- Develop and test regulated price plan (RPP) and TOU billing, including Ontario Energy Board (OEB) mandated billing data links with the Independent Electricity System Operator (IESO) by 2008.

In addition to meeting the requirements laid out by the OEB, Hydro One also set an objective for its AMI project to deploy a platform that could enable a broad range of new initiatives that will extend beyond basic automated meter reading for billing purposes.

The following initiatives are included in Hydro One's strategy for meeting future energy needs, while also delivering better service to customers:

- TOU pricing
- Theft detection and other automated billing functions
- Direct and/or premises-based load control
- In-premise displays
- Real time outage information
- Distribution automation
- Distribution grid monitoring.

Capgemini, an integral part of the project team, is responsible for overall project management support, new systems integration, legacy systems management, integrated process design and operational services. Capgemini was appointed as a business process and IT outsourcing partner for Hydro One in a landmark \$1 billion CAD contract over 10 years in 2002.

The Result

Hydro One and its partners continue to deploy steadily to meet project objectives as planned. Initial meter deployments started in late 2006, and by June 2007, the team surpassed a notable milestone of 100,000 installed smart meters. This puts the project on target to meet its goal of installing 240,000 smart meters by the end of 2007.

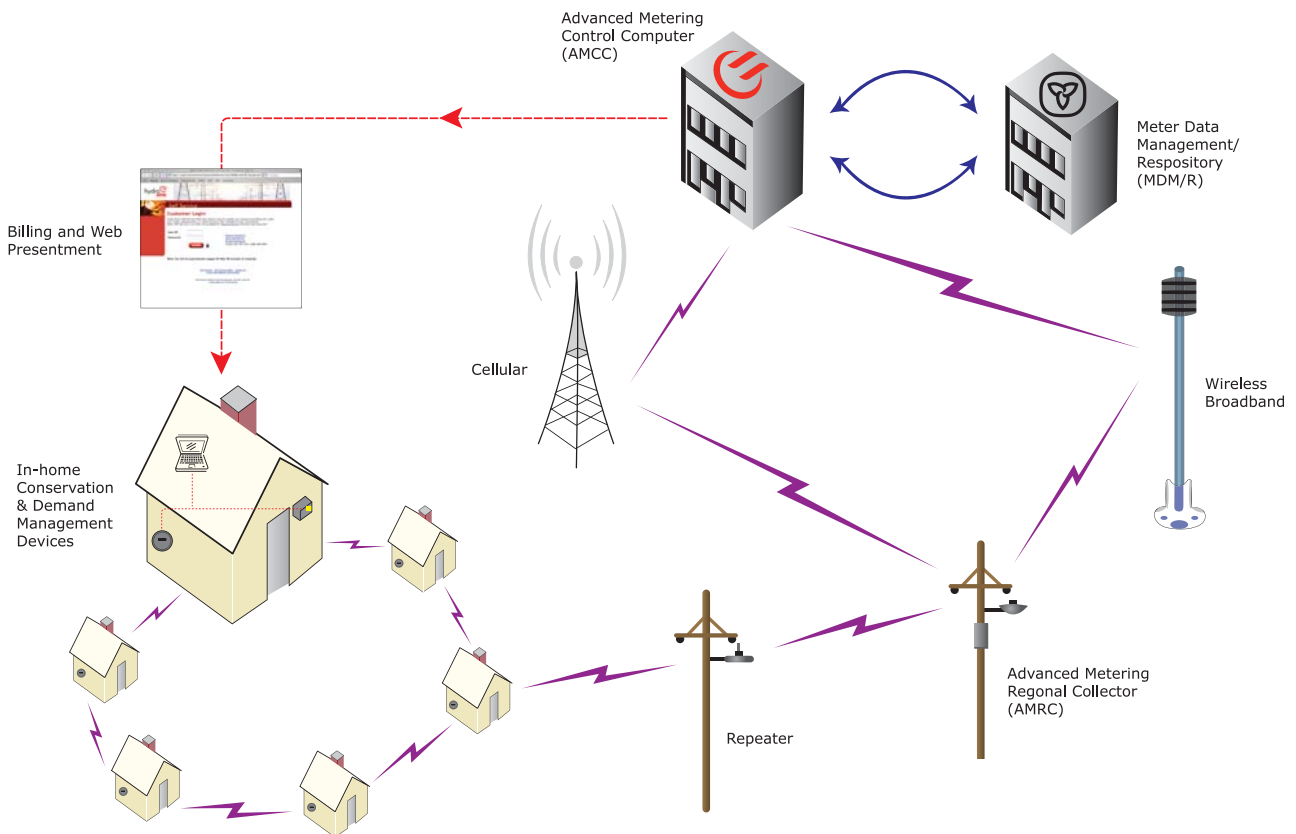
The exceptional achievement played a key role in the Utility Planning Network's decision to select Hydro One as their 2007 award recipient for AMR (Advanced Meter Reading) deployment.

How Hydro One and Capgemini Worked Together

Following the East Coast power outage of 2003—and the concurrent wholesale price volatility—Ontario acted quickly. In July 2004, the Energy Minister directed that 800,000 smart meters be installed by close of 2007, and for all of Ontario's 4.5 million customers by the end of 2010.

For Hydro One, the scope of this challenge was made even more difficult because of the complexity of providing service to both the urban and extremely rugged rural areas of Canada's most populous province. The province of Ontario has a landmass twice the size of Texas and is larger than France and Spain combined. The utility's most

Advanced Metering Infrastructure (AMI)



remote customers are accessible only by rail, helicopter, snowmobile or boat. In some cases, utility employees must travel an entire day to reach just a few customers.

Given the vast territory of Ontario, Hydro One quickly realized that to be successful, this project needed to be more than a basic AMR implementation. At the core of the solution is the need for a ubiquitous communications network and integration approach.

Both elements are required to enable the exploitation of data from many types of devices—AMR, load control, in-home displays, distribution monitoring and control—by posting and making the information available to numerous enterprise applications, such as customer information systems, outage management, asset management, geographic information systems and work execution systems.

To accomplish this task, Hydro One assembled a team of industry leaders to develop the vision for an end-to-end solution that embraced open standards and the use of Internet Protocol (IP) at all communications levels. This would ensure that the network and integration would be available and compatible with multiple field applications.

With deep experience managing large-scale projects like smart meter deployments, Capgemini brings a clear, well-developed, practical approach to implementing this new generation AMI. Working closely with Hydro One, the team used a robust, proven governance model which smoothly manages the 12 discrete work streams.

The team set aggressive goals by aiming to deploy 240,000 smart meters by 2007 and the full 1.3 million by 2010. Capgemini's project management scope includes:

- Meter installation and field service logistics—from strategy and guidelines to tracking
- Commission head-end systems
- Prepare and integrate TOU billing and customer care operations
- Offer strategic direction on retail and wholesale activities.

In the words of Rick Stevens, Director, Development Strategies, Hydro One Networks Inc., *"This team leverages hundreds of utility field personnel who actively seek assignment to our challenging and exciting smart meter project. Having worked with many teams during my time with Hydro One, as well as my role on the AMRA Board and other capacities, I have never seen such a diverse, professional and capable team come together."*



About Capgemini and the Collaborative Business Experience

Capgemini, one of the world's foremost providers of Consulting, Technology and Outsourcing services, has a unique way of working with its clients, called the Collaborative Business Experience.

Backed by over three decades of industry and service experience, the Collaborative Business Experience is designed to help our clients achieve better, faster, more sustainable results through seamless access to our network of world-leading technology partners and

collaboration-focused methods and tools. Through commitment to mutual success and the achievement of tangible value, we help businesses implement growth strategies, leverage technology, and thrive through the power of collaboration.

Capgemini employs over 75,000 people worldwide and reported 2006 global revenues of 7.7 billion euros.

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In collaboration with



Hydro One Networks Inc., wholly owned by the province of Ontario, delivers electricity safely, reliably and responsibly to homes and businesses

across the province. The company owns and operates Ontario's 29,000 kilometer (km) high-voltage transmission network that delivers electricity to large industrial customers and municipal utilities, as well as a 122,000 km low-voltage distribution system that serves 1.3 million end-use customers and smaller municipal utilities..