

# Making the Grade - Choosing Smart Meter Technology that is Flexible, Reliable and Secure

## Chatham-Kent Hydro Pilot Successfully Deploys 1,000 Smart Meters into the Community

**C**hatham-Kent Hydro has approximately 32,000 customers in a geographic area that covers 2,400 square kilometres, served by five transformer stations and 17 distribution substations. Bordered by Lake Erie to the south and Lake St. Clair to the west, the area is known for its flat, open terrain.

In November 2004, Chatham-Kent Hydro launched a pilot to retrofit 1,000 community households with smart meter technology. The project was the result of extensive research and analysis that was carried out by the utility to determine the meter system technology best suited to the needs of its customers, the company's operational requirements, and to the broader government smart metering goals.



Photo Courtesy of C-K Hydro

C-K Hydro's Smart Meter Pilot involves 1,000 households in its service territory. The LDC plans to begin a full-scale deployment to the 30,000-plus customers beginning in 2006.

C-K Hydro chose a retrofit option to convert their existing watt-hour meters to smart interval meters using system technology developed by Tantalus Systems Corporation, a Vancouver-based company that designs and manufactures wireless, two-way, real-time communication networks for distributors.

The pilot project has been up and running for some eight months now and according to C-K Hydro's Hugh Bridgen, Manager of Stations and Distribution, and project leader, the launch has been an unprecedented success.

"In my 27 years I have never experienced something as smooth as this for the introduction of a new technology," he says. "In our opinion we have met all the government goals."

The thorough analysis of available technologies, careful consideration of the needs of the company and its customers, and the alignment of government expectations with the technology choices made by the distributor, all came into play in making the decision.

### Development of Basic Principles Ensured that Goals of the Pilot were Met

Even before the term "smart" meters was coined, Chatham-Kent Hydro was studying the potential advantages and barriers of adopting Automated Meter Reading (AMR) technology



Photo Courtesy of C-K Hydro

The smart meter retrofit module on an existing electromechanical meter. Two-thirds of C-K Hydro's meters will not have to be discarded - they will simply be retrofitted.

as a means to drive improved efficiencies at the utility.

So when the provincial government announced in the spring of 2004 that smart meters (interval and/or time-of-use meters) would be installed in all Ontario households by 2010, C-K Hydro dusted off some of their previous research and re-assessed their plan to move forward with choosing a meter technology that best suited the needs of both the utility and its customers. Their goal was to have a pilot project up and running before year's end.

One of the first steps in developing a viable smart meter pilot was to identify some broader principles, or goals, that would need to be addressed before choosing the technology best

suited for the job. The project team formulated a set of principles and used these as benchmarks in determining which technology and communication protocol aligned best with these overarching goals. Those principles were cited by C-K Hydro in their Conservation Demand Management (CDM) application to the Ontario Energy Board:

- That we are in step with the OEB regarding the technical specifications for the Interval or time-of-use meters;
- That we consider the existing metering assets and reduce the potential to strand significant metering assets;
- That the new meter will support a time-of-use rate structure;
- That we search for opportunities to partner with other Local Distribution Companies (LDCs) and/or companies;
- That our preference is for non-proprietary systems;
- That the communication infrastructure to support smart meters may be used for other applications, such as: load control, AMR, outage management and/or revenue generating systems; and,
- That we establish ongoing cost efficiency and flexibility as a priority.

### Aligning Project Goals with the Right Smart Meter Technology

"At C-K Hydro, we were already assessing new technologies, looking for ways to really drive improved efficiencies across our distribution system while also enhancing customer satisfaction," said Bridgen. "Our vision encompassed... the spirit of the provincial energy board requirements, and led us, after an extensive evaluation process, to select the Tantalus Utility Network (TUNet®)."

The network system adopted by the utility satisfies a number of the goals the LDC had set out to achieve. At the outset, retrofitting their existing meters has a price tag of approximately \$150 per unit, compared with the price of a new meter at around \$400. C-K Hydro has determined that two thirds of its existing residential meters will be easily retrofitted.

C-K Hydro's president Dave Kenney believes that the company will be able to install smart meter technology in their community and to its 30,000 plus customers, at half the estimated \$10 million taken from the OEB's report on smart meter cost estimates for a LDC of this size.

The existing electromechanical meters are retrofitted with a module that will provide interval consumption data, voltage, power quality and power outage information.

A system network that uses hybrid wireless radio technology also has its advantages. C-K Hydro has significant experience and expertise in the area of radio communication as they have operated a SCADA system using 900 MHZ frequency communications for many years. Part of the pilot project has focused on testing signal strength between the installed retrofits and communication tower. Retrofit meters have been installed on the outside of buildings, behind reinforced walls and in basements. They've also been testing the meters from different locations and in varying distances from the communications tower. The connections have held in all cases.

As well, C-K Hydro is able to rely on a number of operational improvements that will assist on the cost recovery front. The system provides a number of operational benefits, including its ability to monitor voltage, report by exception on power outages, its remote disconnect capabilities and its ability to allow grouping of load data for system analysis.

The project team recognized early on the importance of choosing a technology that provided flexibility. Not only is the Tantalus network able to work with other metering manufacturers' products, but it also has the capability to merge with existing systems. In fact, water and gas meter modules are currently being developed. And just as importantly, the technology has the potential to run any number of future applications, including load control and demand-side management modules.

The reliability and security of the system was another important consideration. The very nature of a 'mesh' network enhances communication reliability. Security is achieved by having the ability to store data at multiple points within the system.

### Successful Pilot Project Bodes Well for Full Deployment of Smart Meters

In February, Chatham-Kent Hydro held an Open House at their facility to highlight the success of the pilot. Approximately 25% of Ontario's LDCs sent representatives to the event to learn more about the project. C-K



Photo Courtesy of C-K Hydro

Tantalus' TUNet® system provides cutting edge smart meter technology, meeting all of C-K Hydro's expectations.

Hydro has continued to willingly share information with other utilities and this fall will assist two distributors in implementing a similar smart meter pilot in their communities.

News of the success of the pilot is spreading. In addition to speaking at a number of seminars and conferences in Ontario, C-K Hydro's pilot project is also garnering international recognition. Hugh Bridgen has been asked to speak about the LDC's smart meter pilot at the upcoming AMRA Automation 2005 Conference in the U.S.

C-K Hydro is continuing to run a number of tests on the new system and is currently investigating two-way communication via the web between the utility and its customers. The LDC expects to begin installing the remainder of the retrofits and meters in 2006, pending smart meter legislation later this fall and the regulatory approvals that will enable them to proceed with full deployment.

Meters are retrofitted with a module that will provide interval consumption data, voltage, power quality and power outage information.

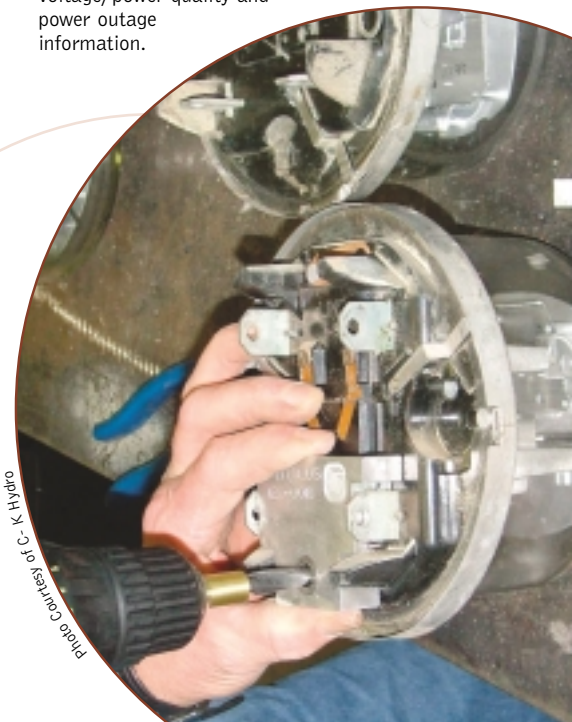


Photo Courtesy of C-K Hydro