

Chatham-Kent Hydro Poised for Full Implementation of Residential Smart Metering by Year's End

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Chatham-Kent Hydro is one of eleven first-phase distribution companies designated by the government to implement smart meters in the province. They are the second distribution company in line to fully integrate into the MDM/R and are on target to achieve full implementation of smart metering for all residential customers by year's end. They have assumed a leadership role as one of the first end-to-end implementers of the initiative.

The experience they have gained and the challenges they have overcome provides important insight for distribution companies who have yet to implement smart metering in their service territories.

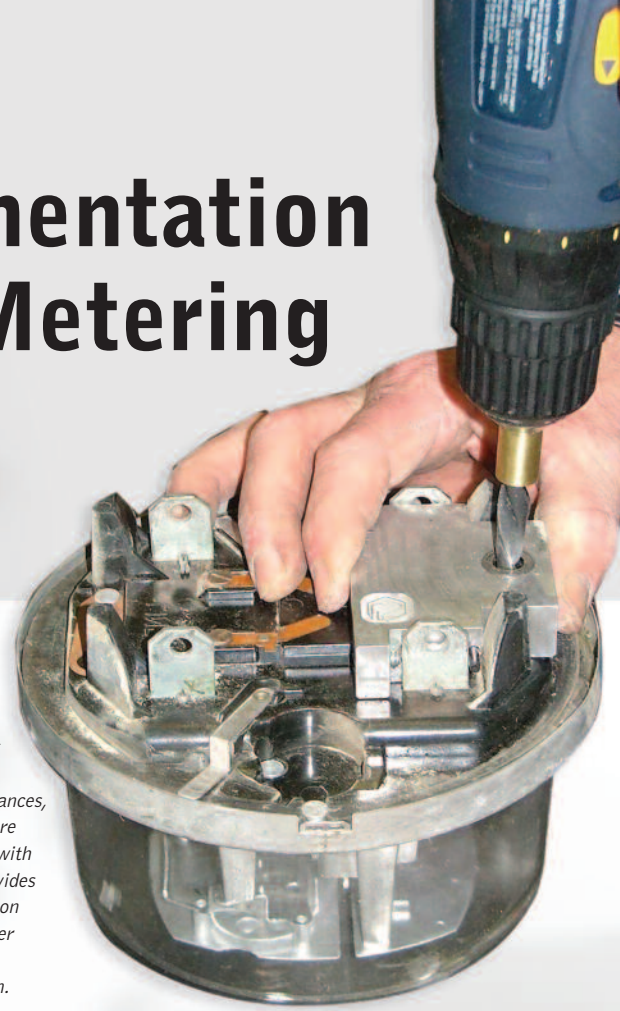
Chatham-Kent Energy is wholly owned by the Municipality of Chatham-Kent. Chatham-Kent Energy was incorporated in 2000 and is the holding company with 3 subsidiaries: C-K Hydro, C-K Utility Services and Middlesex Power Distribution Corporation. Chatham-Kent Energy serves a total of 39,000 electricity customers, with 32,000 in Chatham-Kent and 7,000 customers in the Township of Strathroy-Caradoc and the Municipality of North Middlesex.

The Pilot

Chatham-Kent Hydro (CKH) completed its Smart Meter pilot project in 2006 with the installation of 1,000 meters. The goal was to confirm a technology that was able to deliver error-free communication throughout Chatham-Kent's service area. After months of review and discussions with various vendors, the TUNET® system from Tantalus was chosen by the utility.

Chatham-Kent used a consultant to review all of the assumptions, financial calculations and suppositions from the pilot in order to derive objective conclusions. The resulting report summarized and re-checked the implications of extending the TUNET® deployment to all meters in the Chatham-Kent Hydro service area. With the report in hand, full deployment was requested and granted by the Minister of Energy in 2006.

Tantalus TUNET® system provided C-K Hydro's cutting edge smart meter technology and in certain instances, existing meters were simply retrofitted with a module that provides interval consumption data, voltage, power quality and power outage information.



Full Residential Smart Meter Deployment

Schedule adjustments had to be made and resource requirements doubled in order to meet the milestone of full deployment by December 2007. Work to complete the installation project began in June 2006.

Meter deployment was carried out by CKH crews, who played a critical part in the initiative's success. Customer acceptance of the technology was critical. The company's meter installers carried a positive message into the communities and neighbourhoods where the meters were being deployed. This went a long way in gaining customer support for the initiative. Customer contact with employees also helped to sensitize the installers to customer concerns and priorities.

In addition, local crews were better able to survey the condition of the distribution system and identify potential hazards – not just at the meter, but anywhere on the system as meters were installed throughout the utility's territory.

Meter installations tracked ahead of schedule and came in on budget. By December 2007 all residential customers had a new smart meter installed. Initial budget estimates forecasted smart meter deployment costs at \$175 per meter with all costs in (as cited in the consultant's 2006 report). The total per meter cost eventually decreased to approximately \$170 per meter.

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Chatham-Kent Hydro Poised for Full of Residential Smart

Technical Challenges Addressed

The pilot showed that the technology worked and could be deployed at a very competitive cost. The TUNET® modules were retrofitted into existing electromechanical meters, which eliminated significant write-offs and helped to keep costs down. Certain challenges did arise along the way that had not been identified in the pilot. The mass deployment caused the network to grow quickly and consequently, it generated increased traffic on the system. The effect was that the network took longer to recognize a deployed meter and register it into the network. This issue arose midway through the deployment and Tantalus was able to fix the problem by fine-tuning network communication priorities and data packets.

TUNET® uses a wireless hybrid system for all network communication. It makes use of a long range 220MHZ licensed frequency and a shorter range unlicensed 902-928MHZ frequency band for meter to meter communication. The combination works very well until you saturate a neighbourhood with meters. The combined effect starts to impact consumer electronics using the same frequency band, such as cordless phones. The issue was addressed by a software upgrade transmitted to all the deployed meters in the field. The software fix was part of a planned upgrade that had to be accelerated in the schedule.

As issues arose, the flexibility of the TUNET® system allowed upgrades to be made as required. It confirmed CKH's confidence in the system as each problem was fixed with relative ease.



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Customer Education is Key

A key part of smart meter implementation is customer education. To get the word out and better educate customers in the community about the advantages of smart meter technology, CKH gave interviews on radio, spoke with reporters in the local news media, attended community events and gave group presentations to Senior and community organizations. This kind of community public relations continues to be an important part of the smart meter initiative.

Now that the meters are deployed, customers are learning how to use the various tools that smart meter technology provides.

Chatham-Kent Hydro imports the daily interval information into its CIS system (Harris Computer Systems). A web-based interface provides next day data for customer viewing. This tool gives both daily and hourly information to customers, highlighting the Time-of-Use periods in the day. While customers may not be charged TOU rates at this time, these tools provide the ability to modify consumption habits. This is helping to provide a better understanding of how smart meters can assist consumers in better managing their energy usage and costs.

Integration into the MDM/R and Time-of-Use Pricing

CKH will be the second distribution company to go live with the MDM/R.

Over the past year, some 220 customers have been billed using TOU pricing. Due to the small pool of customers involved, the meter data for billing purposes has been processed using internal procedures. In order to integrate into the MDM/R, efforts have focused on modifying procedures and systems to comply with the new criteria.

The exercise has required considerable effort and has involved a number of departments within the utility - billing, metering, IS, regulatory and engineering. CKH has now completed the test scripts and is poised to roll out TOU billing to all of its customers by billing cycle. All meter data will pass through the MDM/R. It is estimated it will take until December 2008 to complete the roll-out to all residential customers.

Future Smart Meter Plans

Chatham-Kent Hydro is now deploying smart meters to all general service customers with <50kW usage. This customer class is within the mandate given to CKH by the Ministry in 2006 and will be completed by June 2009. It is assumed that all remaining customer classes will follow, but CKH is waiting for explicit approval to do so from the Ministry and the Ontario Energy Board (OEB).

Implementation Metering by Year's End

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The most promising aspects of Smart Metering, is the "window" the AMI network opens onto the distribution system. TUNET® allows for near real time outage notifications and voltage monitoring. CKH plans to use this information and funnel it through a new Outage Management System being planned for 2009. In addition, voltage information offers new ways of detecting theft of power, which with a bit of math and data mining, could pay huge dividends.

As large scale projects go, the transition to smart meters has been smoother than expected. Making full use of the available data is the next challenge for the utility. Smart meters are expected to strengthen the LDC industry by increasing data flow from the distribution system, and providing detailed information about usage patterns and system behaviour. This will positively impact CKH's ability to deploy demand management systems, monitor equipment loading, predict loss reduction from system upgrades, and finally, offer customers the information they need to help them conserve and control the rising cost of energy.

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