



# Hydro One Leads the Way In Smart Meter Development

CUSTOMER SUCCESS

Hydro One Networks Inc., wholly owned by the Province of Ontario, delivers electricity to homes and businesses across a territory of 1.3 million customers. Hydro One owns and operates a 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 customers and smaller municipal utilities.

## Solution At-a-Glance

- More than 1.2 million smart meters deployed over a four-year period
- Trilliant 2.4 GHz SecureMesh® communications network reading 95 percent of the customer meters across the urban and rural territory
- Trilliant CellReader® solution for sparsely populated residential areas not suited for RF Mesh
- Drive-by hybrid AMI solution under development for extremely low density rural customers
- Single head-end system for RF Mesh, point-to-point cellular and working together to develop a solution that can also perform drive-by meter reading

In 2010, Ontario's energy board mandated that time-of-use (TOU) pricing for consumers be available for all consumers on a regulated price plan. To meet this requirement, Hydro One needed to quickly deploy a smart meter and intelligent communications network solution to meet the provincial government's requirement at a low cost. The network needed to cover Hydro One's expansive service territory, which has a land mass twice the size of Texas, and its customers live in a mix of urban, rural, and remote areas, some places only accessible by air, rail, boat or snowmobile.

Most importantly, the network needed to enable future enterprise-wide business efficiencies, modernization of distribution infrastructure and enhanced customer service.

To meet these needs, Hydro One conceptualized an end-to-end solution leveraging open standards and Internet Protocols (IP) at all communication levels. The utility drew upon industry leaders like Trilliant to realize this vision.

## A Multi-Tier Solution: Trilliant Success for Smart Metering

Hydro One's award winning advanced metering infrastructure (AMI) network uses Trilliant's communications platform, which allows the communications technology to harness the benefits of smart distribution and smart metering, which results in a smart consumer. Hydro One's network is comprised of a two-way self-healing mesh radio network based on the global IEEE 802.15.4 standard. Trilliant's SecureMesh solution for smart metering forms a central nervous system for the smart grid, providing intelligent communications, connecting devices from a range of leading manufacturers, and supporting advanced metering, demand response and other advanced smart grid solutions like smart distribution. For Hydro One's deployment, meters from three major meter manufacturers are equipped with Trilliant's proprietary SecureMesh Network Interface Cards (NICs) that enable meter data communications over the mesh network.

In the future, in-premise smart thermostats and in-home displays will also operate over the common communications network. Trilliant's smart meter solution provides the flexibility to accommodate cellular, broadband, or fiber WAN backhaul capability.

In addition to connecting residential meters, Hydro One needed a solution for more than 10,000 hard-to-reach commercial and industrial (C&I) meters. Trilliant's CellReader® modules are installed under the glass of C&I meters to enable near real-time visibility into complex meter data via public cellular networks.

Hydro One is also using the Trilliant UnitySuite™ Head-End Software for network configuration and management, meter reading services, device management and demand response applications. The software delivers valuable operational insight by making available a wide range of reporting and charting capabilities together with real-time operational dashboards that monitor Hydro One business processes and services, service levels and key performance indicators.

### A Phased Approach

Replacing 1.2 million meters with a geographically dispersed work force is a monumental task. Additionally, with such an expansive territory, determining definitive locations of physical assets, such as poles and towers where network infrastructure could be mounted posed a significant challenge.

An initial pilot deployment of 15,000 meters was conducted to identify improvements that could be applied to the mass deployment of the network and meters. While meter installers were field testing tools and procedures, a market research firm was following behind to gather customer feedback on the installation process and education materials. The results of the customer survey spoke for themselves—more than 90 percent of customers surveyed were very pleased with the process and more than 80 percent of customers felt the information provided by Hydro One was useful and informative.

After successfully completing the pilot and incorporating lessons learned, Hydro One began the work of deploying the AMI infrastructure across the province.

### Results to Date

From the dense urban city of Brampton to the most rural areas by Lake Superior, the reliability and performance of the Trilliant SecureMesh network for smart metering has helped Hydro One meet its regulatory requirement of moving 1.2 million consumers to TOU pricing by June 2011. In fact, Hydro One is able to make consumption information available to customers online the day after electricity is used.

Success of Hydro One's modernized grid extends beyond the smart metering deployment itself.

Ontario's encouragement of renewable energy projects has resulted in nearly 26,000 "micro-scale" (10 kW or less) renewable installations in the province in just two short years (the majority of the applications being in the Hydro One service territory). Ontario is now Canada's leading province for wind and solar capacity and home to Canada's four largest wind and solar farms. This represents a private sector investment of \$9 billion and is projected to create about 50,000 direct and indirect modern energy jobs.

### Plans for the Future

Building on its smart meter success, Hydro One is moving forward with a Smart Distribution project that will modernize its distribution system and realize the province's advanced vision of a smart grid. Initial applications to be enabled by the Trilliant SecureMesh network will include voltage monitoring, real-time outage notification and remote disconnect of meters. Hydro One will reap the benefits of Trilliant's applications for smart distribution, smart metering and smart consumers for years to come.



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