



Hydro Ottawa SMART METERS AND TIME-OF-USE RATES



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In 2004, the Ontario Ministry of Energy mandated all local distribution companies (LDCs) to install smart meters for all residential and small commercial customers. Ontario has been a leader in smart meter installation, with one of the largest deployments of smart meters in the world. Hydro Ottawa began installing smart meters in 2006 and virtually all of Hydro Ottawa's residential and small commercial customers now have a smart meter.

PURPOSE OF A SMART METER

A Smart Meter monitors and records how much electricity is used in a home or business, and when it is used. The smart meter measures electricity consumption data over short time periods, usually an hour, and stores this information. It then communicates the data wirelessly to a central computer. The data is used to calculate the customer's bill.

SMART METERS AND TIME-OF-USE RATES

Smart meters are designed to work with time-of-use rates, which vary at different times of the day, charging more for electricity consumed during peak-demand periods and less for electricity consumed during low-demand periods. Almost all Hydro Ottawa customers are now billed on time-of-use rates.

With smart meters and time-of-use rates, distribution companies can provide detailed information on the customer web portal, MyHydroLink, itemizing how much electricity was consumed and when it was consumed. The bill also displays the three rate periods and the amount of consumption used within those periods. This is intended to encourage customers to shift consumption, where possible, to lower-cost times of the day and week, and to more actively manage their electricity usage.

BENEFITS OF SMART METERS AND TIME-OF-USE RATES

When Ontario electricity consumers shift some electricity use to off-peak hours, it reduces peak demand on the provincial electricity system. Over the longer term, lower peak demand will mean a reduced need for new generating, transmission and distribution infrastructure, lowering costs for all Ontarians. In addition, a reduction in peak demands means that the province can also reduce its use of carbon-dioxide-emitting generators that are called on when demand is high, lowering greenhouse gas emissions.

Electricity customers also benefit in their homes or businesses. A smart meter system encourages conservation and demand management programs, using new technologies such as energy management devices or smart appliances to reduce electricity usage and save money on bills.

Smart meter data also provides comprehensive, detailed information for electricity system planning, allowing planners to identify where future generation, transmission and distribution investments are required. Smart meters also help LDCs to identify power theft and respond to meter failures and outages more quickly, and they help LDCs identify greater operational efficiencies in local distribution system management. All of these efficiencies lower electricity costs for customers.



ONTARIO'S SMART METER INFRASTRUCTURE

Much like a telephone or internet connection, the smart meter connects into a wide computer network across Ontario.

From a home or business, the smart meter initiates a series of actions: collecting energy use information, verifying its accuracy and processing it for monitoring and billing. The Smart Meter Entity (SME) is responsible for the central data repository (known as the MDM/R) that manages all of this consumption data for residential and business smart meters.

The MDM/R ensures that all Ontario's more than 4.5 million residential and small business consumers have access to accurate smart meter billing information regardless of where they live. The MDM/R processes, stores and protects electricity consumption information. The system has been operating since March 2008.

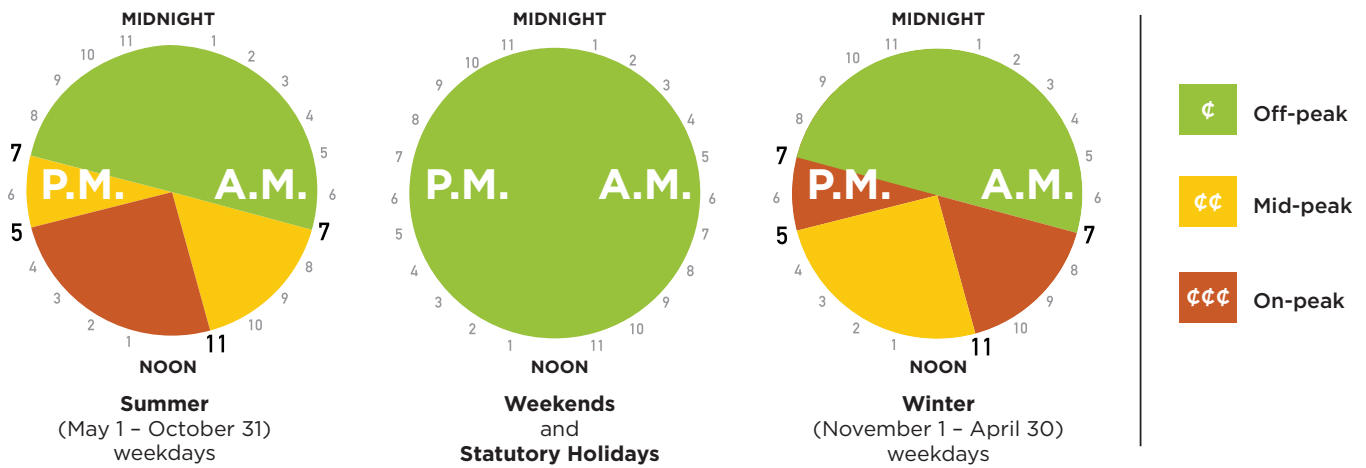
HYDRO OTTAWA CUSTOMER TRANSITION TO TIME-OF-USE RATES

By the end of 2011, Hydro Ottawa moved more than 99 percent of eligible customers to time-of-use billing, with almost no negative feedback. Hydro Ottawa studies show that the first 4,000 customers on time-of-use rates achieved, on average, a small savings over a one-year period (savings of \$0.73 per month) by making small changes to shift some of their consumption away from peak periods.

Customers are becoming more aware of their energy use, and more interested in learning how to reduce their electricity costs. Hydro Ottawa's customer service portal, MyHydroLink, shows customers their energy consumption by the hour, day, month and billing period. This innovation is made possible by the new digital smart meters.

Power monitors that receive constant data from smart meters are also available to show customers in real time the current electricity rate, current consumption, cumulative consumption and charges, and even to isolate the power demand of appliances or other machines.

Time-of-Use Rate Periods



REGULATORY MANDATE FOR SMART METERS AND TIME-OF-USE RATES

Hydro Ottawa is governed by provincial and federal legislation regarding the use of smart meters. This legislation:

- > requires the use of smart meters (provincial *Electricity Act, 1998*);
- > requires that meters must be re-verified for accuracy, (federal *Electricity and Gas Inspection Act*);
- > provides the right of access for installation of meters (*Electricity Act, 1998* and *Electricity and Gas Inspection Act*);
- > provides the right to disconnect in order to replace a meter (*Electricity Act, 1998*); and
- > requires the use of time-of-use rates (*Ontario Energy Board Act, 1998*).

Hydro Ottawa must complete its small number of remaining meter changes to meet these legal requirements. Hydro Ottawa must comply with an Ontario Energy Board directive to bill all residential and small business standard supply service customers using time-of-use rates, which necessitate the use of smart meters.

Completing the transition to smart metering will also reduce system costs. There are significant costs to process data and maintain these few remaining meters. Since the company has not been able to access these meters for several years, there is also potential for power theft or inaccurate bills based on estimates.



RECOVERING SMART METER COSTS

The costs of the Smart Meter initiative are recovered through the electricity rates paid by all customers — specifically, through the Delivery Charge on the customer bill. The Delivery Charge covers the costs associated with building, maintaining and operating the provincial and local electricity systems. A portion of these charges, including smart meter costs, are fixed and do not change from month to month. The rest are variable and increase or decrease depending on the amount of electricity that customers use.

SMART METERS AND RADIO FREQUENCY

Hydro Ottawa's smart meters communicate using radio frequency, as do all advanced meters in Ontario. The radio frequency emitted by these meters is well within the safety guidelines established by Health Canada.

Biomedical studies in Canada and other countries indicate there is no scientific or medical evidence that a person will experience adverse health effects from exposure to radio frequency fields, provided that exposure is within the safety guidelines established by Health Canada. Health Canada's guidelines also outline safety requirements for the installation and use of devices that emit radiofrequency fields.

Smart meters typically transmit their data six times per day and each transmit interval is a few minutes long. The meters remain dormant the rest of the time.

When the smart meter is transmitting, the exposure to radio frequency at a distance of 10 centimetres from the meter is more than **30 times lower** than the exposure limit set by Health Canada. At a distance of 100 centimetres (40 inches) from the meter, the exposure drops to **3,000 times lower** than the exposure limit set by Health Canada.

This calculation is for radio frequency energy radiated outward from the front of the meter. The power transmitted toward the rear of the meter is typically a further five to ten times lower.

Sources: Hydro Ottawa website, Ministry of Energy website, Independent Electricity System Operator website

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