



Environmental
Commissioner
of Ontario



Managing a Complex Energy System – Results

**Annual Energy Conservation Progress Report – 2010
(Volume Two)**



2.3.3 Smart Meter and Time-of-Use Implementation Target



In 2004, the provincial government announced a smart meter installation target as part of its plan to create “a culture of conservation and make Ontario a North American leader in energy efficiency.”³¹ The target requires the installation of smart meters for all low-volume consumers (households and small businesses) by 2010, with an interim target of 800,000 meters in place by 2007.

In 2009, the government announced the province-wide roll-out of TOU rates as part of the Regulated Price Plan (RPP) which regulates the price of electricity for low-volume consumers. The government targeted having one million consumers on TOU pricing by the summer of 2010, rising to 3.6 million by June 2011.

In support of the government’s TOU pricing target, the Ontario Energy Board (OEB) has mandated TOU prices for all households and small businesses with smart meters. LDCs have been given mandatory TOU dates (ranging from June 2011 to December 2012) by which time they must begin implementing TOU prices for customers billed under the RPP. To enable the OEB to monitor progress, LDCs are also required to report monthly on their progress towards implementation of smart meters and TOU pricing.

There are three key activities a distributor must undertake in order to implement TOU pricing: smart meter installation, smart meter enrolment with the Meter Data Management and Repository (MDM/R), and activation of TOU pricing by the mandatory date.

Results

Tracking progress on achievement of the targets must take into account changes that affect the size of the customer base mandated to receive smart meters and be billed on a TOU basis. Since the first smart meter installation target was announced, the number of low-volume consumers has increased from 4.5 million to over 4.7 million. It is important to note that the total number of eligible low-volume consumers constantly fluctuates as some accounts are closed or new ones are opened. The eligibility of General Service (GS) customers (i.e., mainly small businesses and other customers with less than 50 kilowatts (kW) of monthly demand) as low-volume consumers can also fluctuate month-to-month depending on their electricity usage in a given billing period.

Smart Meter Installation Target:

As the ECO previously reported, the interim target of 800,000 meters installed by the end of 2007 was successfully met.³² The final target requiring installation of smart meters for all low-volume consumers by the end of 2010 was not achieved – the target was missed by a narrow margin. By December 31, 2010, a total of 4.57 million smart meters had been installed, representing 97 per cent of eligible consumers (see Table 9). This includes 99 per cent of all residential customers and 76 per cent of eligible GS customers.

Missing the 2010 installation target was essentially the result of slower installation of smart meters for GS customers. LDCs began installing smart meters at different times and, in response to the target, some LDCs focused on residential meters first. Adding to the delay, some LDCs reported difficulties in acquiring three-phase meters for GS customers (different from the single-phase meter used for residential customers) that are compatible with their Advanced Metering Infrastructure (AMI).³³

The ECO considers the smart meter installation target to be achieved (given that the number of meter accounts fluctuates and the target is constantly moving). As noted in Table 9, over 4.7 million smart meters had been installed as of July 31, 2011, representing over 99 per cent of all eligible customers.

Table 9: Smart Meter Installation Target – All Low-Volume Consumers by December 2010

	Target Date: December 31, 2010		Target Achieved: July 31, 2011	
	RPP Consumers	Smart Meters Installed	RPP Consumers	Smart Meters Installed
Residential	4,308,140	4,262,152	4,320,242	4,315,004
General Service	406,737	307,824	413,376	375,981
Total	4,714,963	4,570,270	4,733,618	4,690,985
Percentage of Target Achieved		97%		99%

Source: Ontario Energy Board

Time-of-Use Implementation Target:

As the ECO previously reported, the summer 2010 TOU target was met in September 2010 with over one million consumers being billed using TOU pricing.³⁴ The next step of the TOU pricing target was to have 3.6 million customers on TOU billing by June 2011. By June 30, 2011, 2.8 million homes and small businesses, more than half of all RPP consumers, were on TOU pricing.³⁵

Several LDCs have experienced unexpected technical issues during their transition to TOU billing which has delayed TOU implementation. In Ontario, a single meter data management system, the MDM/R, provides a common platform for storing, processing and managing all smart meter data.³⁶ Before an LDC can bill based on TOU pricing, it must first integrate its back office systems with the MDM/R. This requires acquiring new or upgrading existing AMI and billing systems that are compatible with the MDM/R, and then performing a series of software and firmware tests. During this process, several LDCs experienced unanticipated delays due to operational or technical issues, and have applied to the OEB for an extension of their mandated TOU date. At the time of writing this Report, 21 of the 39 LDCs with a mandatory June 2011 TOU date have applied for extensions, 19 have been approved and 2 denied.

Table 10: Time-of-Use Implementation Target – 3.6 Million Consumers by June 2011

	Target Date: June 30, 2011	As of August 31, 2011
Residential	2,532,929	2,966,322
General Service	139,870	160,635
Total	2,803,547	3,126,957
Percentage of Target Achieved	78%	87%

Source: Ontario Energy Board

According to the most recent data available at the time of writing this report, there are currently more than 3.1 million RPP consumers on TOU billing. Of the 76 LDCs with TOU mandatory dates:³⁷

- 6 LDCs have completed TOU billing for all their RPP consumers;
- 4 LDCs have completed TOU billing for all RPP consumers with the exception of certain customers temporarily exempt for technical reasons;
- 16 LDCs have transitioned some of their RPP consumers to TOU billing; and,
- The balance of LDCs have yet to convert any customers to TOU billing.³⁸

Conservation Impact of TOU Pricing

TOU prices take into account when, as well as how much, electricity is used to better reflect real differences in the cost of supplying electricity at different times. TOU prices can also provide an incentive to shift load, that is, move some usage away from peak periods to off-peak and mid-peak periods when the cost is lower. Load shifting is particularly important for Ontario as the difference between peak demand and average demand has risen over the past 15 years, due to increased use of air conditioning. Expensive sources of electricity supply, primarily natural gas “peaker plants” are needed to meet these periods of high demand. However, TOU pricing in concert with other conservation measures can reduce the need for future peaker plants.

Despite the recent drop in demand caused by the recession, growth in electricity demand is expected to increase as shown in Figure 3. Under a medium growth scenario, by 2030 peak demand is expected to reach a level similar to Ontario’s summer peak record set in 2006. In a high growth demand scenario, peak demand could rise much faster. The IPSP will need to allow for flexibility in meeting this scenario and TOU prices can play an important role.

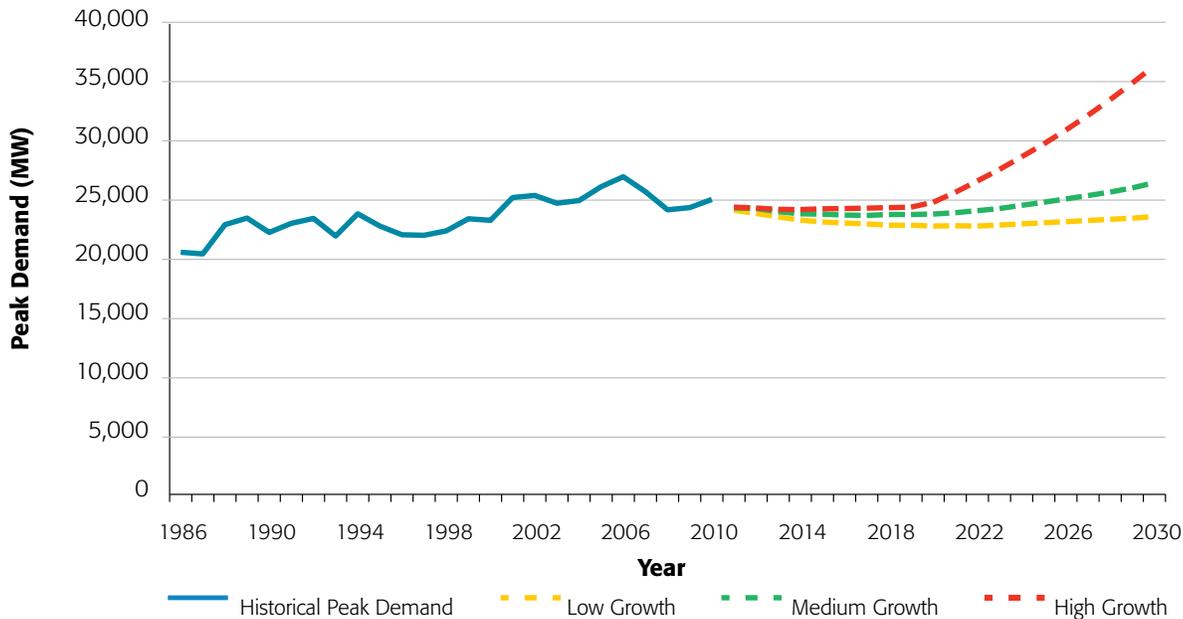


Figure 3: Historical and Forecast Peak Demand Under Three Demand Scenarios

Source: Ontario Power Authority

By 2030, the OPA forecasts that smart meters and TOU pricing will contribute 409 MW of peak demand savings, although this is dependent on the price differentials and time periods for peak and off-peak TOU rates.³⁹ At this time, however, there is insufficient data to accurately determine the impact of TOU pricing. To address this issue, the OEB has begun a data collection project to collect smart meter usage data from customers across the province, comparing patterns of electricity consumption before and after TOU billing. The database will be used to support an analysis of the current TOU regime and provide a basis for evaluating any alternative approaches to the TOU pricing structure or price setting methodology in the future.⁴⁰ The OPA, in collaboration with key stakeholders, is also developing an evaluation methodology that will enable measurement of the conservation impact of TOU pricing.⁴¹ The methodology is expected to be finalized in time to measure the TOU impact of the 2011 to 2014 conservation programs.

ECO Comment

TOU billing is still relatively new in Ontario; with implementation staggered across the province, there is currently insufficient data to assess the conservation impact. However, according to a survey of recent studies across North America, TOU pricing can reduce on-peak demand between 3 to 5 per cent.⁴² Although the effect of TOU may seem small, it is not unimportant. For example, a 5 per cent drop in peak demand is equivalent to the generation capacity of two or three peaker plants. Furthermore, TOU rates can ensure less electricity is used at peak times when power is most expensive.

There are also additional opportunities to increase savings from smart meters and TOU pricing. As the ECO has previously noted, increasing the price differential between on-peak and off-peak prices and converting to suite metering in multi-unit residential buildings could potentially deliver greater savings.⁴³ Furthermore, TOU pricing in combination with enabling technologies, such as load control devices or real-time feedback, has been found to increase conservation impacts.⁴⁴ As additional technologies and methods of responding to TOU rates continue to be developed, the potential for demand savings may increase.

The ECO is disappointed that data collection and analysis to track the actual reduction in peak demand due to TOU pricing is just beginning now. Given that reducing peak demand was the prime driver for introducing smart meters and TOU pricing in the first place, the ECO would have expected that a method of tracking the impact of TOU pricing on consumers' electricity consumption patterns would have been in place sooner.

Had this methodology been established sooner, preliminary results from LDCs already billing using summer TOU rates (e.g., Toronto Hydro, Hydro One) could have been evaluated. This would have enabled the OEB to respond more rapidly in making changes to TOU rates or time periods in order to reduce peak demand, if needed. The ECO encourages the OEB to make use of this data as part of its semi-annual updates to TOU prices.

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Although the June 2011 TOU implementation target has not yet been achieved, the ECO believes that LDCs have worked diligently and made good efforts towards meeting the government's smart meter installation and TOU pricing targets. Most of the delays in TOU implementation have resulted from technical issues uncovered during the extensive testing processes. The OEB has carefully assessed each application for extension and mandated TOU implementation as soon as technically feasible. The ECO believes a good balance has been achieved between ensuring technical issues are resolved prior to TOU billing and encouraging TOU implementation.

The ECO will continue to monitor the progress of the implementation and impact of TOU pricing, including the

OPA's TOU impact evaluation methodology and the OEB's data collection project, for inclusion in future reports.

2.4 Newly Established Electricity Conservation Targets

The years 2014 and 2015 are the next key dates for observers of Ontario's progress on electricity conservation. In 2010, the government announced policies that established two new distinct sets of targets: one for the 2010 to 2014 period setting CDM targets to be met by LDCs; and, a second set of targets to be achieved province-wide from activities of all organizations responsible for conservation – LDCs, the OPA, governments and others – for milestone years (2015, 2020, 2025 and 2030) in the period covered by the government's LTEP.

2.4.1 Local Distribution Companies' Conservation and Demand Management Targets – 2014

As a condition of their licence, each Ontario LDC has been assigned a CDM target by the OEB. The target stipulates an amount of both demand reduction (MW) and energy savings (GWh).⁴⁵ Each LDC's conservation target is essentially proportional to its share of provincial peak demand and annual electricity consumption, based on recent historical data for its franchise area.