

# Chapter 1

Ministry of Energy

## Section 1.11

# Smart Metering Initiative

Follow-Up on VFM Section 3.11, 2014 Annual Report

RECOMMENDATION STATUS OVERVIEW						
	# of Actions Recommended	Status of Actions Recommended				
		Fully Implemented	In Process of Being Implemented	Little or No Progress	Will Not Be Implemented	No Longer Applicable
Recommendation 1	4	1	1	1	1	
Recommendation 2	3		2		1	
Recommendation 3	3		3			
Recommendation 4	1	1				
Recommendation 5	1				1	
Recommendation 6	1					1*
Recommendation 7	1			1		
Recommendation 8	1			1		
Recommendation 9	2	1	1			
Recommendation 10	1	1				
Recommendation 11	1		1			
<b>Total</b>	<b>19</b>	<b>4</b>	<b>8</b>	<b>3</b>	<b>3</b>	<b>1</b>
<b>%</b>	<b>100</b>	<b>21</b>	<b>42</b>	<b>16</b>	<b>16</b>	<b>5</b>

\* Hydro One (now Hydro One Inc.) ceased to be an agency of the Crown following passage of the *Building Ontario Up Act, 2015* on June 4, 2015. As a result, our Office no longer has the authority to do audit or follow-up work on Hydro One Inc.

## Background

The Ontario government's Smart Metering Initiative (Smart Metering) is a large and complex project that required the involvement of the Ministry of Energy (Ministry), the Ontario Energy Board (OEB), the Independent Electricity System Operator (IESO), and over 70 distribution companies, including Hydro One. In 2004, the government

announced plans to reduce energy consumption in the province by creating a culture of conservation. One aspect of this plan was the installation of smart meters in homes and small businesses across Ontario. As of June 2016, approximately 4.8 million smart meters (unchanged since May 2014) had been installed in homes and at small businesses across Ontario.

Smart meters, like conventional meters, track the quantity of electricity used. However, the smart

meters also log use by time of day. This feature allows for the introduction of time-of-use (TOU) pricing, which is intended to encourage ratepayers to shift electricity usage to times of off-peak demand, when rates are lower. Under TOU pricing, electricity rates are highest during the day, but drop at night, on weekends and on holidays. The combination of smart meters and TOU pricing was expected to encourage electricity conservation and reduce demand during peak times by encouraging ratepayers to, for example, run the dishwasher or clothes dryer at night rather than in the afternoon, and set the air conditioner's thermostat a few degrees warmer on summer afternoons. The reduction of peak demand could reduce the need to build new power plants, expand existing ones or enter into additional power purchase arrangements.

In our *2014 Annual Report*, we found that Smart Metering was rolled out by the Ministry with aggressive targets and tight timelines, without sufficient planning and monitoring by the Ministry, which had the ultimate responsibility to ensure that effective governance and project-management structures were in place to oversee planning and implementation. Many of the anticipated benefits of Smart Metering had not been achieved and its implementation had been much more costly than projected.

Our other significant concerns included the following:

- The Ministry did not complete any cost-benefit analysis or business case prior to making the decision to mandate the installation of smart meters. In contrast, other jurisdictions, including British Columbia, Germany, Britain and Australia, all assessed the cost-effectiveness and feasibility of their smart-metering programs before proceeding.
- After the government announced the rollout of Smart Metering in April 2004, the Ministry prepared a cost-benefit analysis and submitted it to Cabinet. However, the analysis was flawed; its projected net benefits of approximately \$600 million over 15 years were significantly overstated by at least \$512 million.
- The Ministry had neither updated the projected costs and benefits of Smart Metering, nor tracked its actual costs and benefits, to determine the actual net benefits realized. As the project progressed, there were many challenges with its development and implementation. As of May 2014, our analysis showed that overall smart meter-related implementation costs had reached almost \$2 billion (compared to the initial projected cost of \$1 billion), with additional costs to come. The majority of these costs were passed on to the ratepayers in Ontario.
- The purpose of Smart Metering was to enable TOU pricing, which was expected to reduce electricity demand during peak periods. The Ministry set several targets to reduce peak electricity demand, but these targets had not been met.
- Ratepayers pay different amounts for the same power usage depending on where they live in Ontario, mainly due to different delivery costs of over 70 distribution companies. For example, at the time of our 2014 audit, a typical residential electricity bill could vary anywhere between \$108 and \$196 a month, mainly because of the variation in delivery costs ranging from \$25 to \$111 a month charged by different distribution companies.
- The difference between the On-Peak and Off-Peak rates had not been significant enough to encourage a change in consumption patterns. When TOU rates were introduced in 2006, the On-Peak rate was three times higher than Off-Peak; by the time of our 2014 audit, that differential had fallen to 1.8 times.
- The significant impact of the Global Adjustment on TOU rates was not transparent to ratepayers. Between 2006 and 2015, the 10-year accumulative actual and projected Global Adjustment totalled about \$50 billion which was equivalent to almost five times the

2014 provincial deficit of \$10.5 billion. The Global Adjustment represented an additional payment covered by ratepayers over the market price of electricity and it accounted for about 70% of each of the three TOU rates.

- Under Smart Metering, a \$249-million provincial data centre was established to collect, analyze and store electricity consumption data. However, most distribution companies used their own systems to process smart-meter data. The costs of this duplication—one system at the provincial level and another locally—were passed on to ratepayers.
- Additionally, we noted that many of Hydro One's billing complaints related to the increases in the TOU rates, connectivity issues between smart meters and associated communication systems, bills based on errors arising from smart meters connected to incorrect addresses, and other Hydro One billing system issues.

In our report, we directed recommendations to the Ministry, the IESO, Hydro One and the OEB. We recommended that business cases be prepared before proceeding with any major projects in the future; that the structure and pricing of the TOU program be re-evaluated; that Hydro One improve its systems for dealing with ratepayer complaints about billing and metering issues; that the impact of the Global Adjustment on electricity bills be transparent to ratepayers; and that the limitations and options surrounding the provincial data centre be reassessed.

We made a number of recommendations for improvement and received commitments from the Ministry, the IESO, Hydro One and the OEB that they would take action to address our recommendations.

## Standing Committee on Public Accounts

In May 2015, the Standing Committee on Public Accounts (Committee) held a public hearing

on our 2014 Smart Metering Initiative audit. In November 2015, the Committee tabled a report in the Legislature resulting from this hearing. The Committee endorsed our findings and recommendations. The Committee made eight additional recommendations and asked the Ministry, the IESO, and the OEB to report back by the end of March 2016. The Committee's recommendations and follow-up on their recommendations are found in **Chapter 3**.

## Status of Actions Taken on Recommendations

The Ministry, the OEB and the IESO provided us with information in spring and summer of 2016 on the current status of the recommendations we had made in our *2014 Annual Report*. According to the information we received, only about 20% of our recommendations had been fully implemented, specifically in the areas of conducting a cost-benefit analysis prior to implementing major initiatives in the electricity sector; educating the distribution companies about the proper business processes to follow when submitting consumption data to the provincial data centre; and improving security controls when accessing smart-meter data. The Ministry was in the process of implementing about 40% of our recommendations, mainly in the areas of considering different scenarios or alternatives as part of the long-term energy process; ensuring ratepayer concerns are addressed properly and in a timely manner, and that clear, timely and accurate bills are issued to ratepayers; and proposing changes to legislation that would require utilities to report smart meter-related fire incidents. However, the Ministry has shown little or no progress in 16% of our recommendations, specifically in areas such as reducing the duplication of smart-meter processing costs, and ensuring that Ontario's electricity supply and demand forecasts are critically re-evaluated periodically. Three recommendations

will not be implemented and one recommendation addressed to Hydro One is no longer applicable. Hydro One did not participate in our follow-up work. Hydro One Inc., formerly called Hydro One, and its subsidiaries are no longer agencies of the Crown under the *Building Ontario Up Act, 2015*, and so, are not required to respond to our recommendations. We were therefore unable to assess the status on our recommendation regarding its contracting and procurement activities.

The status of each of our recommendations is summarized below.

## Governance and Oversight of Planning and Implementation

### Recommendation 1

*To ensure that any future major initiative in the electricity sector is implemented cost-effectively and achieves its intended purposes, the Ministry of Energy should:*

- *conduct a cost-benefit analysis or business case prior to implementing an initiative to assess costs, benefits and risks;*

**Status: Fully implemented.**

#### Details

In our 2014 audit, we found that the Ministry did not complete any cost-benefit analyses or business-case studies before making the decision to install smart meters across Ontario. The lack of a proper cost-benefit analysis exposed the province to unanticipated risks and unknown cost.

During our follow-up, we found that the Ministry has since performed business-case studies prior to undertaking recent projects related to smart-metering initiatives.

In late 2014, the Ministry worked with the IESO and the Advanced Energy Centre to prepare a business case for a new data project that combines time-of-use (TOU) consumption data with other data relating to, for example, weather, location and property information, and consumers' participation

in conservation. The purpose of this project is to develop a combined data set that the Ministry can use to analyze electricity usage and make informed decisions on energy policy, infrastructure planning and conservation programs. The Ministry, IESO and Advanced Energy Centre consulted with 18 local distribution companies to assess the costs, benefits and implementation considerations of the project, including ways to ensure the privacy and security of customer information. The business case determined that the potential benefits will outweigh the potential costs. The Ministry is currently reviewing and assessing the business case to determine further action.

In fall 2014, the Ministry commissioned a study to evaluate the current state of the smart grid in Ontario. Smart grid is an intelligent electricity infrastructure that uses advanced communications and control technology to improve the flexibility, reliability and efficiency of the electricity system (smart metering represents the first step toward creating a smart grid). To maximize benefits and minimize risks to Ontario, the study evaluated three different smart grid deployment scenarios for the future. It also identified potential barriers to achieving the full value of the estimated benefits. This report will inform the Ministry's future policy considerations with regard to the development and adoption of the smart grid.

- *review the role of the Ontario Energy Board as an independent regulator when ministerial directives that impact electricity rates are issued;*  
**Status: Will not be implemented. The Office of the Auditor General continues to believe that the role of the OEB as an "independent" regulator should be reviewed.**

#### Details

After the government announced Smart Metering in April 2004, the Minister of Energy issued a directive to the OEB requiring it to develop an implementation plan to achieve the government's smart-meter targets. Our 2014 audit noted that

the Ministry had set aside the regulatory role of the OEB. Instead of conducting a cost-benefit analysis and submitting the analysis to the OEB for independent review and objective evaluation, the Ministry directed the OEB to develop the implementation plan and project the costs associated with implementation.

The *Energy Statute Law Amendment Act, 2016*, proclaimed into force on July 1, 2016, changed the electricity planning process in Ontario. Under the new legislation, the Ministry is responsible for developing and updating Long-Term Energy Plans for Ontario while the OEB is responsible for preparing an implementation plan when the Ministry requests it. In other words, the Ministry will not implement this recommendation because the new long-term energy planning process does not enable OEB to review and approve the Ministry's plans as an independent regulator.

- *consider different scenarios or alternatives as part of the planning process to assess possible risks and uncertainties; and*

**Status: In the process of being implemented by mid-2017.**

#### Details

In our 2014 audit, we found that many other jurisdictions, including British Columbia, Germany, Great Britain and Australia, all assessed the cost-effectiveness and feasibility of smart-meter programs before implementing them. Compared to these other jurisdictions, the implementation of smart metering in Ontario was without a proper cost-benefit analysis, including an assessment of the risks and costs associated with the project.

During our follow-up, we found that the Ministry has considered different scenarios, possible risks and uncertainties in the development of the smart grid. In fall 2014, the Ministry commissioned a study that identified and evaluated three different deployment scenarios and their potential barriers. This study will help the Ministry make decisions on the policy framework and tools needed to best

support the development of the smart grid, and to maximize benefits and minimize risk for Ontario.

With respect to planning for the energy sector, the *Energy Statute Law Amendment Act, 2016* requires the IESO to submit a technical report to the Ministry containing information on the adequacy and reliability of electricity resources with respect to anticipated electricity supply, capacity, storage, reliability and demand. The Ministry is required to develop the Long-term Energy Plan after thorough consideration of the technical report, different scenarios, and risks and feedback from public consultations. Subsequent to the new legislation that came into effect the Ministry has begun the development of the next Long-Term Energy Plan, which is to be finalized and released in mid-2017.

- *re-evaluate and update the implementation plan periodically to identify and respond to changing conditions and unforeseen events in the electricity market.*

**Status: Little or no progress.**

#### Details

Our 2014 audit found that Smart Metering was implemented without sufficient periodic re-evaluation of Ontario's electricity supply and demand positions throughout the implementation period. As a result, the province maintained the aggressive implementation timelines and approved significant new increases in power generation capacity even though the demand for electricity fell in 2016.

The new *Energy Statute Law Amendment Act, 2016* also requires the Ministry to periodically issue a Long-Term Energy Plan that sets out the government's goals and objectives for the energy sector, including adapting to changing market, technology and economic conditions. The Ministry is required to consult with consumers, distribution companies, generators, transmitters, and other stakeholders in the energy sector in developing the Long-Term Energy Plan. However, since the new legislation came into effect, the Ministry has not re-evaluated the Long-Term Energy Plan.

## Billing Impacts on Electricity Charge to Ratepayers

### Recommendation 2

To ensure that the combination of smart meters and time-of-use (TOU) pricing is effective in changing ratepayer electricity-usage patterns to reduce peak electricity demand and related infrastructure costs, and that ratepayers understand the impacts of TOU pricing on their electricity bills, the Ministry of Energy should work with the Ontario Energy Board and/or the distribution companies to:

- evaluate TOU pricing design, including TOU rates, TOU periods and the allocation of the Global Adjustment across the three TOU rates;  
**Status: In the process of being implemented by April 2021.**

### Details

Our 2014 audit found that the difference between the On-Peak and Off-Peak electricity rates was not significant enough as an incentive for ratepayers to reduce peak electricity demand. We also found that the distribution of TOU periods did not fully reflect actual patterns of electricity use. Because of the substantial growth of the Global Adjustment (an extra charge mainly to cover the gap between the guaranteed prices paid to contracted power generators and the electricity market price), the On-Peak-to-Off-Peak ratio dropped from three-to-one in 2006 to 1.8-to-one in 2014, meaning that On-Peak power cost 1.8 times as much as Off-Peak at the time of our last audit.

Subsequent to our audit, on November 16, 2015, the OEB completed an extensive review of the TOU pricing design and increased the ratio between On-Peak and Off-Peak to a minimum of 2:1. The OEB has also released a report that set out a multi-year plan that will redesign the electricity pricing structure. The five actions included in the multi-year plan are as follows:

1. update the pricing plan's objectives, including a greater focus on peak demand reduction;

2. improve consumers' understanding of the TOU program and how to effectively respond to TOU pricing;
3. conduct pricing pilots to determine an optimal pricing structure;
4. engage low-volume business consumers to discuss TOU concerns; and
5. work with the government to reduce regulatory barriers that limit OEB's ability to change the TOU periods and the allocation of Global Adjustment.

The OEB has already incorporated new objectives into its pricing plan (action 1). It was in the process of implementing the remaining four actions. For example, the OEB has retained a consultant to assist with the redesign of its consumer website (to be completed by early 2017), to help consumers better respond to TOU pricing and manage their energy consumption (action 2). The OEB also engaged an expert to help set up pricing pilots to assess options for new TOU designs (action 3). And, in an effort to widen the difference between On-Peak and Off-Peak rates, the OEB changed the way the Global Adjustment is allocated across the three TOU rates (action 5). As a result, the On-Peak rate was more than two times higher than Off-Peak rate at the time of our follow-up.

Throughout 2017 and 2018, the OEB will be implementing pilots to assess the different pricing and non-pricing mechanisms. The OEB estimated that it will take about three to five years to fully implement the redesign of the electricity pricing structure.

- monitor trends in ratepayer electricity consumption to evaluate the effectiveness of TOU pricing over time; and

**Status: In the process of being implemented by December 2018.**

### Details

The distribution companies that we consulted during our 2014 audit said they did not conduct studies to examine the changes in consumption after the



implementation of TOU pricing. Studies commissioned by the Ontario Power Authority (now the IESO) and the OEB concluded that TOU pricing had only a modest impact on reducing peak demand among residential ratepayers, a limited or unclear effect on small businesses, and no impact at all on energy conservation.

Subsequent to our audit, the IESO and OEB conducted three studies since 2014 to monitor trends in ratepayer electricity consumption and evaluate the effectiveness of TOU pricing over time.

In February 2016, the IESO published the results of a study indicating that residential customers showed clear patterns of shifting their electricity consumption from high- to low-peak periods, but little evidence of conservation. The magnitude of consumption-shifting, however, also appeared to diminish from 2012 to 2014, as people either shifted less of their usage to low-peak times, or they slowly reverted back to high-peak usage. Small businesses showed only marginal consumption-shifting behaviours and were less responsive to the TOU prices than residential customers.

The OEB commissioned a consumer researcher to gather evidence on consumer awareness about TOU. Key findings from the consumer research, completed in January 2015, were as follows:

- consumers have a moderate level of awareness of the TOU program;
- residential and business consumers displayed confusion and a lack of understanding about the electricity system in Ontario;
- many consumers do not understand the charges on their electricity bills;
- beyond knowing the names of the TOU periods, consumer awareness of the system falls off drastically; and
- even consumers who are aware of TOU pricing may still not understand when and how it works or what they need to do to reduce their electricity bills.

The OEB also commissioned another review to assess how consumers are responding to the

current pricing structure in Ontario. The December 2014 review showed the following:

- the perceived or actual monthly savings from shifting energy consumption away from high-peak times may not be enough to encourage consumers to permanently change their household routines in a meaningful way;
- the behaviours required to shift from high- to low-peak hours are perceived as being too complex and time-consuming;
- automatic or routine behaviours are hard to change; even those who understand TOU pricing and intend to shift their consumption behaviours may not end up doing so because of scheduling hassles.

The OEB indicated to us that consumers' response to the TOU program can be improved by better educating them about TOU pricing. As such, the OEB has made consumer education one of its priorities. It is currently working with a newly established Consumer Panel to assess what information consumers need to understand the system. The OEB is also in the process of implementing pilot projects that focus on building consumer awareness.

- *disclose the components of the TOU rates (electricity market price and Global Adjustment) separately on electricity bills so that the impact of the Global Adjustment is transparent to ratepayers.*

**Status: Will not be implemented. The Office of the Auditor General continues to believe that this is a viable practice to increase both the awareness and transparency of the impact of the Global Adjustment to ratepayers.**

#### Details

In our 2014 audit, we found that the impact of Global Adjustment on TOU rates was not transparent to ratepayers because it was embedded in the TOU rates on the electricity bills. We noted that the Global Adjustment charged to ratepayers had

increased significantly since 2006 and accounted for about 70% of each TOU rate in 2013.

The OEB has considered our recommendation, but decided not to implement it. The Global Adjustment is a component of the cost of electricity and is incorporated into the setting of TOU prices. OEB does not believe a breakdown of TOU prices would clarify pricing for consumers but likely to create more confusion. It does not think that showing the Global Adjustment as a separate line item will help consumers make decisions about electricity consumption and how to manage their electricity costs. Instead, it believes consumers are focused on their TOU usage when making decisions about how to reduce their electricity costs. Instead of showing the Global Adjustment as a separate line item on the electricity bill, the IESO publicly reports the Global Adjustment breakdown by business and consumer categories. It also indicated that it will conduct pilots to assess other changes to make the electricity bills easier to understand, including the following:

- renaming the TOU time periods;
- redesigning the visual presentation of TOU time periods;
- modifying the presentation of the electricity bill; and
- providing better information on different household appliances, such as the amount of electricity the appliance consumes, the cost of that electricity, and how use and costs can be managed under TOU pricing.

However, the OEB has limited ability to mandate changes to the electricity bills of low-volume consumers because they are governed by Ontario regulations. The OEB noted in its response that consumers have access to information regarding the cost of the Global Adjustment through IESO's publicly available market price website. The OEB's Regulated Price Plan Reports also provide details on estimates of the Global Adjustment costs and how those costs are allocated to the three TOU periods.

Our position is that these changes will not address our recommendation to increase awareness

of Global Adjustment among ratepayers and transparency of its impact on them.

### Recommendation 3

*To ensure that ratepayer concerns are addressed properly and in a timely manner, and that clear, timely and accurate bills are issued to ratepayers, the Ministry of Energy should work with the Ontario Energy Board, Hydro One and other distribution companies to:*

- *improve tracking of the nature and details of ratepayer enquiries and complaints to identify and monitor common or recurring concerns;*
- Status: In the process of being implemented by December 2016.**

#### Details

Our 2014 audit found that many distribution companies we consulted did not track enquiries and complaints separately, nor did they log the nature or type of complaints. As a result, they were unable to quantify the volume of complaints relating to Smart Metering before and after its implementation, and could not separate concerns about smart meters from those about billing.

At the time of our follow-up, the OEB had implemented processes for tracking and monitoring the concerns it received from energy consumers as part of its responsibility for protecting the interest of consumers. With respect to customer complaints to distribution companies, the OEB is going to require distribution companies to address consumer complaints within 10 business days and to maintain records of complaints. Once the new process becomes mandatory, distribution companies are required to report to the OEB on service quality metrics related to complaints and customer communications. This information will allow the OEB to assess the distributor companies' complaint handling practices and to identify trends in complaints that require further investigation.

- *better educate ratepayers about the impacts of time-of-use (TOU) pricing and other factors*



*on electricity bills, as well as the root causes of potential metering or billing issues and what is being done to address them; and*

**Status: In process of being implemented by December 2018.**

#### Details

Our 2014 audit found that ratepayers usually raised questions and concerns about Smart Metering by contacting the OEB and the distribution companies. Between 2008 and 2014, about two-thirds of customer enquiries and complaints received by the OEB questioned the TOU pricing structure and whether it would save them money. Those distribution companies that tracked the nature of complaints also reported that a majority of the concerns raised by ratepayers was related to TOU pricing.

As previously mentioned under Recommendation 2 (bullet 2), the OEB commissioned two consumer research studies that suggested consumers are still unsure about how TOU pricing works. The OEB indicated that by December 2018, it will implement the following actions:

- improve the electricity bill to clarify TOU pricing for consumers, such as modifying the presentation of the electricity bill and including better information on how the cost of operating household appliances can be managed; and
  - redesign its consumer website to improve the delivery of useful information and tools to help consumers take full advantage of TOU pricing and manage their energy consumption and costs.
- *identify and fix any problems with their billing systems and local communication systems on a timely basis, and monitor the performance of those systems over time to reduce ratepayer complaints triggered by these problems.*

**Status: In process of being implemented by December 2016.**

#### Details

At the time of our 2014 audit, Hydro One (now Hydro One Inc.), Ontario's largest distribution company, was adapting to and working on some technical issues with its new billing system. This resulted in complaints about erroneous bills, prolonged estimated bills, delayed bills and other billing errors. In addition, some ratepayers did not receive any bills or received only estimated bills for extended periods because actual consumption data was not available given connectivity issues between the smart meters and associated local communication systems.

Subsequent to our audit, the OEB required Hydro One to develop plans and take corrective actions to fix the technical issues affecting its customer billing system and the smart-meter network. The OEB informed us that Hydro One fixed its billing problems and returned to normal collection operations in mid-2015.

To minimize billing errors in the future, the OEB also implemented the following new billing rules that require all distribution companies to:

- issue bills based on actual meter readings instead of estimates;
- stop disconnecting customers for an unpaid bill where all of the consumption was estimated;
- achieve a 98% billing accuracy score based on a new OEB performance measure calculation; and
- implement monthly billing instead of bi-monthly billing to their customers by no later than December 31, 2016.

## Billing Impacts of Delivery Charge on Ratepayers

### Recommendation 4

*To ensure that the unanticipated costs incurred by distribution companies in implementing the Smart Metering Initiative are justified, and that any significant cost variations among distribution companies are adequately explained, the Ontario Energy Board*

*should perform detailed reviews of distribution-company costs, including an analysis of cost variations for similar services among different distribution companies.*

**Status: Fully implemented.**

#### Details

Our 2014 audit found that each distribution company negotiated with different vendors to procure systems for their regions. This resulted in significant differences in the costs incurred by distribution companies. Such wide variation was mainly due to geographical issues in service areas and the degree of upfront expenses, such as project-management and system-integration costs.

Since our last audit, the OEB has completed detailed reviews of all distribution company costs, including an analysis of cost variations for similar services among different distribution companies. Although the analysis found variations in smart meter costs among the distribution companies, the OEB's adjudication process found these cost variations to be reasonable and approved them.

#### Recommendation 5

*To improve cost-efficiency of the distribution companies and reduce variations in distribution companies' costs, the Ministry of Energy, in conjunction with the Ontario Energy Board, should formally conduct a cost-benefit analysis into consolidating distribution companies as recommended by the Ontario Distribution Sector Review Panel.*

**Status: Will not be implemented.** The Office of the Auditor General continues to believe that the Ministry should formally conduct a cost-benefit analysis into consolidating distribution companies to improve cost-efficiency of, and to reduce cost variations in, distribution companies.

#### Details

Our 2014 audit found that ratepayers pay significantly different amounts for the same power usage depending on where they live in Ontario and which distribution company provides the service. The Ontario Distribution Sector Review Panel,

established by the Minister of Energy, made a recommendation to merge the existing distribution companies into eight to 12 larger ones. The mergers were expected to help reduce sector-wide operating costs by 20% in areas such as customer service, billing, facilities maintenance and administration.

During our follow-up, the Ministry advised us that although the government will not legislate or force consolidation within the distribution sector, it has created incentives for voluntary consolidation. In June 2015, the Ontario government announced a time-limited relief on taxes pertaining to transfers of electricity assets, such as transactions involving the merger or acquisition of distribution companies. Between January 1, 2016, and December 31, 2018, the provincial transfer tax rate of local distribution companies will be reduced from 33% to 22%, and distribution companies with fewer than 30,000 customers will be completely exempt from paying transfer taxes.

#### Recommendation 6

*To ensure that any future project is implemented cost-effectively and in compliance with sound business practices, Hydro One should review and improve its contracting and procurement activities, such as retaining adequate documentation to justify vendor selection and evaluation and acquiring enough knowledge about a project's business requirements before issuing a Request for Proposal, to minimize the risks of significant contract-cost increases.*

**Status: No longer applicable.** Hydro One (now Hydro One Inc.) ceased to be an agency of the Crown following passage of the *Building Ontario Up Act, 2015* on June 4, 2015. As a result, our Office no longer has the authority to do audit or follow-up work on Hydro One Inc.

#### Details

Our 2014 audit noted that the smart-meter project management and system-integration costs incurred by Hydro One were significantly high compared to other distribution companies. We identified areas where Hydro One could improve its contracting and procurement practices.

In February 2016, our Office formally requested Hydro One Inc. (previously Hydro One) to report back on the status of its actions taken to address our recommendation. In response to our request, Hydro One Inc. notified our Office that it will not participate in our follow-up work. Since the government passed the *Building Ontario Up Act, 2015*, under which Hydro One Inc. and its subsidiaries are not agencies of the Crown, Hydro One Inc. is not required to participate in this follow-up. Without receiving any status updates from Hydro One Inc., our Office was not able to assess and report on the status of this recommendation.

## Smart-Meter Data Processing Systems and Costs

### Recommendation 7

*To ensure that ratepayers are not burdened with the duplicated and ongoing costs of system development and integration, the Ministry of Energy should work with the Independent Electricity System Operator (IESO), the Ontario Energy Board (OEB) and the distribution companies to re-evaluate options around operating the provincial data centre and/or having separate local systems at individual distribution companies in order to determine the cost-effectiveness of various options and avoid continued duplication of systems and costs.*

**Status: Little or no progress.**

### Details

The government designated the IESO as a Smart Metering Entity with an exclusive authority to operate a provincial data centre to collect, analyze and store smart-meter data; and to calculate electricity usage so that distribution companies can bill their customers using TOU pricing. However, our 2014 audit found that most distribution companies were using their own systems to process smart-meter data, resulting in duplication of systems and costs.

At the time of our follow-up, we found that the Ministry has made little progress in reducing the duplication of smart-meter processing costs.

The Ministry did not re-evaluate options around operating the provincial data centre and/or having separate local systems at individual distribution companies in order to determine their cost-effectiveness and avoid continued duplication of systems and costs. The Ministry indicated that if local distribution companies are duplicating the functionalities of the provincial data centre, they are acting contrary to government regulation.

We noted the same issue we raised in 2014 where a large distribution company, with about 700,000 smart-meter customers, was not transmitting any data to the provincial data centre although their customers were charged the 79¢-a-month fee. Although this company has obtained approval from the OEB to fully integrate with the provincial data centre and has agreed to start using the provincial data centre to process TOU bills by September 2017, we found that ratepayers of this distribution company have continually paid for the monthly charge, totalling about \$20.9 million as of mid-2016 (up from \$7.7 million at the time of our 2014 audit), for a data centre the company has yet to start using.

The OEB issued an order in 2016 requiring IESO to implement more robust data gathering from smart meters and distribution companies. The IESO, in consultation with the Office of the Information and Privacy Commissioner of Ontario, is to develop an implementation plan to allow third-party access to depersonalized smart-meter data. This third-party access is intended to enable more detailed analysis of consumption across the province, with the resulting information used to support rate design, regional electricity planning and conservation initiatives.

### Recommendation 8

*To ensure that any future province-wide project involving the complex electricity distribution sector is implemented cost-effectively, the Ministry of Energy should work with the relevant electricity sector organizations to set appropriate and reasonable implementation targets and timelines in order to*

*minimize the costs and risks associated with system development and integration for numerous distribution companies.*

**Status: Little or no progress.**

#### Details

In 2014, we found that the Ministry set tight and aggressive timelines for implementing TOU pricing. In particular, 40 out of 73 distribution companies applied for extensions to their mandated implementation dates because of operational or technical problems, including delays in integrating with the provincial data centre and data-quality issues with certain smart meters.

The Ministry acknowledged the importance of planning and consulting with various stakeholders before implementing any major initiatives in the future. The new energy planning process requires the Ministry to consult with various stakeholders in developing the next Long-Term Energy Plan, which is expected to be released by the Ministry in mid-2017. Although the IESO and OEB will develop and submit implementation plans to the Ministry for review, it is unknown at the time of this follow-up whether or not the specific targets and timelines are appropriate and reasonable.

## Smart-Meter Data Accuracy and Quality

### Recommendation 9

*To ensure the accuracy, quality and usefulness of smart-meter data, the Independent Electricity System Operator should:*

- *work with the distribution companies to review the limitations and the billing problems associated with the provincial data centre and the distribution companies' business processes, including improving the procedures of processing smart-meter data during meter replacements and power blackouts, as well as enhancing the data retrieval and querying capability of the provincial data centre; and*

**Status: In the process of being implemented by December 2016.**

#### Details

At the time of our 2014 audit, we found several shortcomings in the way the provincial data centre processed smart-meter data (such as limited capabilities for data retrieval and querying), as well as in the business processes of the distribution companies. These limitations had affected the quality and usefulness of smart-meter data.

Subsequent to our audit, the IESO added a new feature to the provincial data centre whereby distribution companies can view summarized statistics on key smart-meter data in real time. This allows the distribution companies to identify issues and correct them as needed. The IESO had provided training for distribution companies on how to use this new feature and to generate correct billings during meter replacements and power blackouts in order to minimize billing errors.

The IESO has also developed and is implementing (by end of 2016) an enhanced data retrieval capability to support the increasing volume and variety of ad-hoc query and data extract requests at the provincial data centre. When the enhanced capability is fully implemented, distribution companies should be able to retrieve larger volumes of data for longer periods and further back in time. In addition, distribution companies should be able to extract data much more quickly than before.

- *educate the distribution companies about the proper business processes that have to be followed.*

**Status: Fully implemented.**

#### Details

In 2014, we reported that some distribution companies did not follow the required business processes to submit time-of-use data to the provincial data centre, compromising the quality and completeness of the data submitted.

Subsequent to our audit, the IESO provided classroom training to distribution companies on the

business processes they should follow when submitting consumption data to the provincial data centre in order to minimize billing errors. To complement these training sessions, the IESO also developed a repository of interactive, web-based training materials that distribution companies can access at their convenience. At the time of our follow-up, 19 courses had been created and accessed more than 200 times by more than 60 unique users from distribution companies.

## Smart-Meter Security and Safety Risks

### Recommendation 10

*To ensure that smart-meter data is processed and stored securely, the Independent Electricity System Operator should work with the distribution companies to improve their system and data-security controls in order to prevent and detect unauthorized access to smart-meter data.*

**Status: Fully implemented.**

#### Details

Our 2014 audit found that improvements could be made to smart-meter data security at the provincial data centre and at the distribution-company level. Smart-meter data could reveal information about customers' daily routines and changes in those routines. As a result, electricity-use patterns could be mined, for example, for marketing and advertising purposes.

Subsequent to our last audit, the IESO and the Information and Privacy Commissioner of Ontario jointly developed a privacy and security framework for the provincial data centre. This framework includes steps to ensure that only local distribution company users and their authorized third-party vendors are able to retrieve smart-meter information.

In November 2015, the IESO received its sixth consecutive annual clean audit by an independent external audit firm that examined the Meter Data Management and Repository's operations,

processes and procedures. The audit confirmed that appropriate controls are in place at the IESO. It also described the controls that should be in operation at local distribution companies to prevent and detect unauthorized access to smart-meter data.

The IESO also recently introduced the following measures to help local distribution companies manage their users' access to the provincial data centre:

- distribution companies must respond to a security question they have previously created when requesting the IESO grant a new user access to the provincial data centre;
- distribution companies must review their users' accounts annually and notify the IESO of any changes required in a timely manner; and
- two webinar sessions were recorded to educate local distribution companies about their responsibilities for establishing security controls within their own organizations to complement those in place at the IESO. The webinars are available at any time to local distribution companies through the Smart Metering Entity's secure on-line information centre.

### Recommendation 11

*To ensure that potential fire risks of smart meters are addressed appropriately and in a timely manner, the Ministry of Energy should work with relevant entities, such as the distribution companies, the Office of the Fire Marshal and the Electrical Safety Authority, to track and monitor information on smart meter-related fire incidents so as to identify and understand their causes in Ontario.*

**Status: In the process of being implemented by December 2016.**

#### Details

In our 2014 audit, we found instances of Ontario ratepayers reporting fires arising from smart meters. However, no accurate or complete information on smart meter-related fires was available in Ontario. Insufficient tracking and monitoring of

smart meter-related fire incidents made it difficult to determine the scope and extent of the problem across the province, creating safety risks in Ontario.

During our audit field work in 2014, the Electricity Safety Authority (ESA), the agency responsible for enhancing public electrical safety in Ontario, started reviewing smart meter-related fire incidents in Saskatchewan to determine if there could be any concern for Ontario. Subsequently, the ESA ordered the distribution companies to remove a specific type of meter because of the potential fire risk. Approximately 5,110 smart meters have since been removed. In July 2015, the ESA issued its final

review report, which concluded that there was no systemic safety risk with any other meter model or design currently used in Ontario. The report also included a recommendation for mandatory reporting of electrical safety incidents involving utility assets, which is currently done by distribution companies on a voluntary basis. The ESA is currently consulting the public on the proposed changes to legislation that would require utilities to report smart-meter incidents, and their final recommendations are expected to be considered or implemented by December 2016.