

Chapter 1

Ministry of Energy

Section 1.05

Electricity Power System Planning

Follow-Up on VFM Section 3.05, 2015 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
Recommendation 1	4	3			1
Recommendation 2	2	2			
Recommendation 3	4	1	3		
Recommendation 4	3	1	2		
Recommendation 5	3		3		
Total	16	7	8	0	1
%	100	44	50	0	6

Overall Conclusion

According to the information the Ministry of Energy (Ministry) provided to us, as of August 4, 2017, about 44% of the actions we recommended in our 2015 Annual Report had been fully implemented, specifically in the areas of engaging the Independent Electricity System Operator (IESO) and other technical experts during the decision-making process and providing more public information for electricity consumers about the impacts of various decisions made. The Ministry was in the process of implementing 50% of our recommendations, mainly in the areas of working with the IESO and other technical experts to determine the optimal supply mix for Ontario; conducting cost/benefit

analysis to assess the impact of decisions on electricity consumers and the power system; monitoring, addressing and publicly reporting on the extent and impact of oversupply of electricity; evaluating various conservation initiatives; addressing current capacity and reliability issues; and performing analysis prior to undertaking major initiatives that would impact transmission. The Ministry will not implement one recommendation, specifically in the area of submitting full technical reports to the Ontario Energy Board for review and approval.

The status of the actions taken on each of our recommendations is described in this report.

Background

Electricity power system planning involves managing the long-term demand for electricity, and determining how to meet that demand through generation, transmission, distribution, exporting, importing and conservation of electricity.

In Ontario, entities involved in province-wide power system planning include the Ministry of Energy (Ministry), the Independent Electricity System Operator (IESO), the Ontario Energy Board (OEB), Ontario Power Generation (OPG), Hydro One, four other small licensed transmitters and approximately 70 local distribution companies.

The importance of planning is reflected in provincial legislation: The *Electricity Act, 1998* was amended in 2004 to require the Ontario Power Authority, or OPA (which was subsequently merged with the IESO in 2015), to conduct independent planning, prepare a detailed technical plan and submit it to the OEB for review and approval to ensure that it is prudent and cost-effective.

However, as of our 2015 audit, no such plan had ever been approved in the previous 10 years as required by the legislation to protect consumers' interests. Instead, the Ministry had issued two policy plans in 2010 and 2013 that were not subject to OEB review and approval. While these policy plans provided some technical information, we found that they were not sufficient for addressing the Ontario power system's needs and for protecting electricity consumers' interests.

While the checks and balances of the legislated planning process were not followed, the Ministry made a number of decisions about power generation through 93 ministerial directives and directions issued to the OPA from 2004 to 2014. Some of these went against the OPA's technical advice and did not fully consider the state of the electricity market or the long-term effects. These decisions resulted in significant costs to electricity consumers. From 2006 to 2014, the amount that residential and small-business electricity consumers

paid for the electricity commodity portion of their bill (including Global Adjustment fees) increased by 70%, from 5.32 cents/kWh to 9.06 cents/kWh. In particular, Global Adjustment fees, which are the excess payments to generators over the market price, amounted to a total of \$37 billion from 2006 to 2014. These payments are projected to cost electricity consumers another \$133 billion from 2015 to 2032.

Among our significant observations:

- We calculated that electricity consumers have had to pay \$9.2 billion more (the IESO calculated this amount to be closer to \$5.3 billion, in order to reflect the time value of money) for renewables over the 20-year contract terms under the Ministry's current guaranteed price renewable program than they would have paid under the previous procurement program.
- In January 2010, the OPA expressed concerns to the Ministry after the Lower Mattagami hydro project's estimated costs increased by \$1 billion from the initial estimate. The Ministry directed the OPA to proceed in order to meet the Ministry's renewable targets, and to invest in Indigenous communities and the economy of Northern Ontario. The average cost for power from this facility is \$135/MWh, while the average cost of electricity produced at two other recent hydro projects outside of the Mattagami River area in Ontario is \$46/MWh.
- The Ministry directed the OPA to convert a Thunder Bay coal plant into a biomass facility despite OPA's advice that the conversion was not cost-effective. The cost of electricity from this facility is \$1,600/MWh—25 times higher than the average cost at other biomass facilities in Ontario.
- The Ministry directed the OPA to cancel contracts for two gas plants planned for the southwest Greater Toronto Area, where the need for them was greatest, and relocate them to Napanee and Lambton. Our 2013 special

reports on the Oakville and Mississauga power plants set cancellation costs at \$950 million.

- At the time of our 2015 audit, Ontario had an oversupply of electricity, with its available supply exceeding its maximum hourly consumption by an average of 5,160 MW per year from 2009 to 2014—an amount approximately equal to the total existing power generation capacity of the province of Manitoba. Meanwhile, Ontario had spent approximately \$2.3 billion in conservation programs between 2006 and 2014, and was committed to spend another \$2.6 billion over the next six years. While we recognize that conservation efforts require sustained commitment, investing in conservation during a time of surplus actually contributes to expensive electricity curtailments and exports that cost the Province money.
- Due to the excessive surplus, Ontario had to pay generators \$339 million from 2009 to 2014 to reduce the production of 11.9 million MWh of surplus electricity, and \$3.1 billion more to produce 95.1 MWh of exported power in excess of what Ontario received in export revenue. As well, there were almost 2,000 hours in which the hourly Ontario electricity market price was negative, and Ontario paid other exporters a net total of \$32.6 million to take our power.
- We found that the lack of a structured, co-ordinated regional planning process has had ongoing negative effects on the performance of the transmission system, including reliability concerns and congestion issues that cost a total of \$407.6 million in payments to generators.

Our audit report recommended, among other things, that the Ministry require full technical plans to be prepared and submitted to the OEB for review and approval; regularly engage with the IESO, OPG, Hydro One, approximately 70 local distribution companies, and other technical experts to consider different scenarios and evaluate cost-

effectiveness during the decision-making process; assess the effects of conservation and its impact on electricity costs during surplus generation periods; evaluate conservation and demand-management programs to ensure they meet cost-effectiveness tests; and work with the IESO, Hydro One and other small transmitters to minimize any unnecessary cost to electricity consumers due to transmission reliability concerns and congestion issues.

This report contained five recommendations, consisting of 16 actions, to address our audit findings.

Most of the Ministry's responses to our recommendations referred to recently introduced draft legislation (Bill 135). Our office was not in a position to comment on the merits of this draft legislation, nor could we assess at that point in time whether the changes proposed in the draft legislation would meet the intent of our recommendations.

Standing Committee on Public Accounts

In November 2016, the Standing Committee on Public Accounts (Committee) held a public hearing on our 2015 Electricity Power System Planning audit. In March 2017, the Committee tabled a report in the Legislature resulting from this hearing. The Committee endorsed our findings and recommendations. The Committee made 10 additional recommendations and asked the Ministry and the IESO to report back by the end of July 2017. The Committee's recommendations and follow-up on their recommendations are found in **Chapter 3.02**.

Status of Actions Taken on Recommendations

We conducted assurance work between April 1, 2017, and August 4, 2017, and obtained written representation from the Ministry of Energy (Ministry)

that, effective September 1, 2017, it has provided us with a complete update of the status of the recommendations we made in the original audit two years prior.

Planning Process Has Broken Down

Recommendation 1

To ensure that electricity power system planning better protects the interests of electricity consumers, the Ministry of Energy should comply with provincial legislation and:

- *clarify the roles of the Ministry of Energy and the Independent Electricity System Operator in preparing future technical plans;*

Status: Fully implemented.

Details

In our 2015 audit, we noted that the *Electricity Act, 1998* was amended in 2004 to require the Ontario Power Authority (OPA, now merged with the IESO) to conduct independent planning and prepare an “Integrated Power System Plan” (referred to hereafter as the “technical plan”) to guide the Province in achieving its energy goals. The OPA/IESO merger legislation, passed in 2014, still requires the new entity, the IESO, to prepare a technical plan. However, after the merger took place in 2015, the Ministry did not provide the IESO with any direction regarding the preparation of the technical plan.

Subsequent to our audit, the *Energy Statute Law Amendment Act, 2016* was proclaimed into force on July 1, 2016. The Act amended the *Electricity Act, 1998* and the *Ontario Energy Board Act, 1998* to clarify the roles of the Ministry and the IESO in future energy planning. Under the new legislation, the IESO is required to develop a technical report, which supports the development of the Long-Term Energy Plan (LTEP).

On September 1, 2016, the IESO submitted the technical report, Ontario Planning Outlook (OPO),

to the Ministry. The OPO technical report presented different planning scenarios for the electricity sector over 20 years, from 2016 to 2035. In addition to the OPO technical report, the Ministry also engaged a third party to prepare another technical report, the Fuel Technical Report (FTR). Released on September 30, 2016, it provides a review of fuel consumption and outlooks from 2016 to 2035. Both the OPO and FTR reports have been posted on the Ministry’s website for public consultation and engagement.

At the time our follow-up, the Ministry was in the process of developing the LTEP, based on information from the two technical reports as well as feedback obtained through public consultation and engagement, which took place from October 2016 to January 2017. The Ministry expects to finalize and release the LTEP in fall 2017.

- *require full technical plans to be prepared on time and ensure that they are submitted to the Ontario Energy Board for review and approval;*
- Status: Will not be implemented. The Office of the Auditor General continues to believe the Ontario Energy Board should review and approve the Long-Term Energy Plan in order to protect the interests of electricity ratepayers.**

Details

Our 2015 audit found that, although having a technical plan had been a legal requirement for over a decade, the Province had never had such a plan in place. From 2004 until the time of its merger with the IESO in 2015, the OPA developed two technical plans, in 2007 and 2011; however, neither of these was ever approved by the OEB because of changes to government policy. Since the OEB was not given an opportunity to review the plans as required under the *Electricity Act, 1998*, it had not been able to ensure that Ontario’s technical energy planning had been carried out in a prudent and cost-effective manner to protect the interests of electricity consumers.

The *Energy Statute Law Amendment Act, 2016*, which was passed subsequent to our 2015 audit, has changed the electricity planning process in Ontario. As previously mentioned, the IESO, as required, submitted the OPO technical report to the Ministry on September 1, 2016. Under the new legislation, the Ministry is responsible for developing the LTEP after thorough consideration of the technical report and feedback obtained through public consultation.

While a public consultation process has been put in place as part of the development of the LTEP, the IESO's technical report and the LTEP are not required to be submitted to the OEB for review and approval. The OEB is only responsible for preparing an implementation plan when the Ministry requests it to ensure that the government's goals and expectations outlined in the LTEP are implemented. In other words, the new long-term energy planning process does not enable the OEB to review and approve the plans as an independent regulator.

- *provide more public information for electricity consumers about the cost drivers of increasing electricity rates and the impact that various decisions have on electricity costs;*

Status: Fully implemented.

Details

Our 2015 audit found that electricity consumers were not informed of the reasons behind rising electricity costs. Although the Ministry's 2013 policy plan identified actions taken by the government to reduce electricity costs, it failed to identify the key cost drivers that had the most significant effect on electricity rates.

As part of the LTEP public engagement and consultation process, the Ministry has provided consumers with more information about the cost drivers of increasing electricity rates and the impact that various decisions have on electricity costs.

The IESO developed seven modules with data and analyses to provide a detailed breakdown of the assumptions, facts and figures used in its OPO

technical report. One of the modules—Electricity System Cost Outlook—illustrated the cost of the electricity system under different demand scenarios (low, flat and high) to show how the cost of delivering, operating and maintaining electricity resources (conservation, generation and transmission/distribution), and the extent to which investments are made in new resources, vary with the level of electricity demand.

The OPO report and related modules were released ahead of the LTEP's public engagement and consultation process, which began in October 2016.

- *review the role of the Ontario Energy Board to determine how it can be made more effective in protecting the interests of electricity consumers.*

Status: Fully implemented.

Details

Our 2015 audit noted that the Ministry had set aside the regulatory role of the OEB even though one of the OEB's key objectives is to protect the interests of consumers with respect to prices and the adequacy, reliability and quality of electricity service.

Subsequent to our audit in 2015, the *Strengthening Consumer Protection and Electricity System Oversight Act, 2015* was proclaimed into force on March 4, 2016. The Act amended the *Ontario Energy Board Act, 1998* and the *Energy Consumer Protection Act, 2010* to enhance the OEB's role in regulating the energy sector in order to protect the interests of electricity consumers. Key changes brought about by the Act include:

- implementing the OEB's recommendation of prohibiting electricity retailers and gas marketers from selling energy retail contracts to consumers at their home;
- giving the OEB the power to determine how an electricity retailer or gas marketer determines the prices it charges for electricity and gas;

- requiring the OEB to establish a process for consumer representation in its proceedings;
- allowing the OEB to appoint a supervisor in situations where a distributor or transmitter is unable to meet its financial obligations or reliability standards to ensure continuity of service for affected consumers; and
- providing the OEB with stronger enforcement powers by allowing it to increase penalties on individuals and corporations that have violated the OEB's rules and directions.

Extensive Use of Ministerial Directives and Directions

Recommendation 2

To ensure that ministerial directives and directions fully consider both the technical-system impacts and economic impacts that affect electricity consumers, the Ministry of Energy should:

- *regularly engage with the Independent Electricity System Operator and other technical expert advisors during the decision-making process;*

Status: Fully implemented.

Details

Our 2015 audit found that, in the absence of an approved technical plan, it had been the Ministry's practice to communicate its energy policy objectives by issuing directives and directions to the OPA (now the IESO). The OPA/IESO often could not apply its own expertise because the rationale behind many of the ministerial directives and directions was not apparent. The Ministry issued over 90 directives and directions to the OPA from the time of its creation in 2004 to its merger with the IESO in 2015. Through them, it made a number of decisions that sometimes went against the OPA's technical advice.

During our follow-up, we found that the Ministry has engaged with the IESO and other technical expert advisers during its decision-making process in developing the LTEP. As previously mentioned under the first action of **Recommendation 1**, the

IESO submitted the OPO technical report to the Ministry on September 1, 2016. The OPO report presented different planning scenarios for the electricity sector from 2016 to 2035. In addition to the OPO report, the Ministry also engaged a third party to prepare another technical report, the Fuel Technical Report. Released on September 30, 2016, it provides a review of fuel consumption and outlooks from 2016 to 2035.

At the time of our follow-up, the Ministry was in the process of developing the LTEP, based on information from the two technical reports as well as feedback from public consultation and engagement. The Ministry expected to finalize and release the LTEP in fall 2017.

- *make the decision-making process more transparent and accountable by providing information to the public on directives, directions and rationales for decisions made.*

Status: Fully implemented.

Details

In our 2015 audit, we found that the Ministry's use of directives and directions to make major decisions had resulted in a process that was less than open and transparent. We found no evidence that ministerial directives and directions were supported by public consultations or economic analyses disclosed to the public.

All directives and directions sent to the IESO have been and are to continue to be publicly posted on the IESO's website. We noted that the Ministry has issued seven directives to the IESO subsequent to our 2015 audit. Our review of these directives noted that they included background information and details explaining the context of and rationale for policy objectives.

As previously mentioned under the first action of **Recommendation 1**, at the time of our follow-up, the Ministry was in the process of developing the LTEP. During the public consultation process, which took place from October 2016 to January 2017, the Ministry held stakeholder sessions

and public open houses in 17 communities across Ontario. It also held 17 sessions with Indigenous communities and organizations. Overall, the Ministry received over 1,500 submissions through its Environmental Registry, emails and other channels. The Ministry is required by the *Electricity Act, 1998* to post all information and data used in the development of the LTEP, including the IESO's OPO report and feedback from public consultation, on a Ministry website.

Problems with Generation Procurement Decisions

Recommendation 3

To ensure that future power generation decisions are made with sufficient economic and financial information that would best serve electricity consumers and Ontario's electricity power system, the Ministry of Energy should:

- *work with the Independent Electricity System Operator, Ontario Power Generation, Hydro One, approximately 70 local distribution companies and other technical experts to determine the optimal supply mix for Ontario;*

Status: In the process of being implemented in fall 2017.

Details

Our 2015 audit found that the Ministry did not fully consider the state of the electricity market or the long-term effects different supply-mix scenarios would have on Ontario's power system in making some decisions about power generation.

During our follow-up, we noted that the Ministry has been working with the IESO and other technical experts to determine the optimal supply mix for Ontario as part of its process of developing the LTEP. As mentioned under the first action of **Recommendation 1**, the IESO developed the OPO technical report, which outlined electricity supply and demand outlooks from 2016 to 2035. The OPO report outlined the value of a balanced supply-mix

approach that does not rely too heavily on any one source of electricity generation. According to the OPO report, "maintaining a diverse resource mix, where the different resources are complementary to each other, is an effective way to provide the various services necessary to support reliable and efficient operations."

In addition to engaging the IESO to determine the optimal supply mix for Ontario, the Ministry has also collected feedback from Ontario Power Generation, Hydro One and several local distribution companies through the LTEP's public consultation process.

- *engage the Independent Electricity System Operator, Ontario Power Generation, Hydro One, approximately 70 local distribution companies and other technical experts to consider different scenarios and evaluate cost-effectiveness when making decisions on new projects;*

Status: Fully implemented.

Details

Our 2015 audit found that, through issuing directives and directions, the Ministry made a number of decisions that sometimes went against the OPA's technical advice and did not fully consider the long-term effects different scenarios would have on Ontario's power system. For example, the Ministry directed the OPA to create the Feed-in Tariff (FIT) program, which has paid excessive prices to renewable energy generators. It also directed the OPA to proceed with a costly hydro project.

At the time of our follow-up, we noted that the Ministry has engaged the IESO and other technical experts to consider different scenarios and evaluate cost-effectiveness when making decisions on the projects that were initiated subsequent to our 2015 audit. For example:

- As mentioned under the first action of **Recommendation 1**, the Ministry is required to develop the LTEP by thoroughly considering the IESO's technical report, different scenarios, and possible risks and uncertainties with

respect to planning for the energy sector. The Ministry has also engaged other experts who provided input during the public consultations that took place from October 2016 to January 2017.

- The Ministry has directed the IESO to conduct in 2016 an annual price review of the FIT program. The resulting 2016 and 2017 FIT price schedules have incorporated feedback from stakeholders, including the local distribution companies. The review has resulted in reductions of FIT prices, ranging from 0.5% to 7%, for new renewable projects, depending on project size and technology.
- In 2016, the IESO initiated the Market Renewal Project (Project), which has the objective of delivering “a more efficient, stable marketplace with competitive and transparent mechanisms that meet system and participant needs at the lowest cost.” Still in its early phase of development, the multi-year Project’s design and implementation are to run from 2017 to 2021. The Ministry indicated that decisions on the future power system will be determined using market-based mechanisms introduced as part of the Project to reduce system costs, improve transparency and provide flexibility as Ontario’s power system needs evolve. The series of reforms to the energy market system that the Project is intended to introduce will draw upon learning from experiences in other jurisdictions. At the time of our follow-up, the IESO was in the process of engaging with stakeholders to build consensus for and public awareness of the design and implementation of the Project.
- *conduct cost/benefit analyses during the planning process to assess the potential impact of a decision on electricity consumers and the power system;*

Status: In the process of being implemented in fall 2017.

Details

Our 2015 audit found that the Ministry made a number of decisions that sometimes went against the OPA’s technical advice. Many of these decisions resulted in significant costs to electricity consumers. For example, the Ministry significantly increased the proportion of renewable energy in Ontario’s supply mix, but it did so without fully evaluating the impact, trade-offs and alternatives through a comprehensive business case analysis.

As mentioned under the first action of **Recommendation 1**, the Ministry was in the process of developing the LTEP at the time of our follow-up. As part of the development of the LTEP, the Ministry will conduct cost/benefit analyses to assess the potential impact of decisions on electricity consumers and the power system. The LTEP is expected to be released in fall 2017.

- *closely monitor, address, and publicly report on the extent and impact of the oversupply of electricity.*

Status: In the process of being implemented by 2021.

Details

Our 2015 audit found that Ontario experienced an oversupply of electricity. From 2009 to 2014, the province’s available electricity supply exceeded its maximum hourly consumption by 5,160 MW per year, on average—an amount that approximated the total existing power generation capacity of the province of Manitoba. The IESO managed surplus electricity supply by exporting power to other jurisdictions and requesting some generators to curtail or completely shut down production.

During our follow-up, we noted that the Ministry has continued to use the Ontario Energy Report, which is a website updated quarterly to provide the public with energy-sector data such as electricity cost, supply, demand and exports during times of surplus generation.

In addition, the IESO has monitored the extent of oversupply of electricity and publicly reported

electricity demand and supply through issuing Market Summaries on a regular basis (daily, weekly and monthly). As part of the OPO technical report submitted to the Ministry for developing the LTEP, the IESO has also publicly reported the forecast surplus power based on different scenarios of electricity demand in Ontario.

As previously mentioned, the IESO has initiated the Market Renewal Project, which is a multi-year project with the design and implementation running from 2017 to 2021. Through this project, the IESO is planning to introduce specific measures to address and manage oversupply of electricity by removing barriers to trading power with neighbouring jurisdictions.

Ineffective Conservation and Demand-Management Initiatives

Recommendation 4

To ensure that its conservation and demand management programs are implemented cost effectively and achieve their intended purposes, the Ministry of Energy should work with the Independent Energy System Operator to:

- *assess the effects of conservation and its impact on electricity costs during surplus generation periods;*

Status: In the process of being implemented in fall 2017.

Details

Our 2015 audit found that the Ministry continued to invest in conservation efforts when Ontario already had significant surplus power. Investing in conservation does not necessarily mean saving money during periods of surplus, because energy savings from conservation efforts can contribute to an oversupply of electricity, increasing power exports and/or curtailing power production. Ontario had to export power at prices below what it cost to produce that power, and had to pay generators even when they were not producing energy; both of these options were costly.

During our follow-up, the Ministry indicated that, as part of the process of developing the LTEP, it will work with the IESO to model and consider the impacts of conservation initiatives on electricity costs during surplus generation periods. At the time of our follow-up, the Ministry was in the process of developing the LTEP, which it expected to release in fall 2017.

- *evaluate programs, such as various conservation initiatives and the Industrial Electricity Incentive Program, to ensure that they support the Ministry's goals and objectives;*

Status: In the process of being implemented by June 1, 2018.

Details

Our 2015 audit found that, although the IESO was accountable for \$2.1 billion of the \$2.3 billion that was spent on conservation initiatives in Ontario from 2006 to 2014, only about \$923 million of this \$2.1 billion was evaluated by a third party for cost-effectiveness.

During our follow-up, we found that the Ministry has worked with the IESO to evaluate various conservation programs as part of a new initiative, the Conservation First Framework, which was introduced subsequent to our 2015 audit. The Framework covers the implementation of conservation programs over six years from 2015 to 2020, emphasizing more teamwork among sector partners, particularly the local distribution companies (LDCs).

Under the Framework, the Ministry and the IESO will continue to perform ongoing evaluation of conservation programs, mainly through the following two processes, to ensure that the programs support provincial needs cost effectively:

- The LDCs are required to develop their own six-year Conservation and Demand Management Plans for delivering conservation programs. These plans include milestones, budgets and expected energy savings. The LDCs have submitted their plans to the

IESO for review and approval. The IESO has posted on its website the plans that have been approved.

- The LDC conservation programs are subject to the IESO's Evaluation, Measurement and Verification (EM&V) process to ensure that they maintain a positive cost-benefit result (with specific exceptions, such as programs for low-income consumers), achieve their intended goals, provide value for consumers and identify opportunities for improvement. The IESO has published evaluation reports on various conservation programs, such as the Aboriginal Conservation Program, Home Assistance Program and New Construction Program.

At the time of our follow-up, the IESO was undertaking a mid-term review of the Framework. The review focuses on conservation targets, budgets, progress, program effectiveness, integration with regional planning, collaboration amongst the LDCs and post-2020 approaches to energy efficiency. The mid-term review is to be completed by June 1, 2018.

- *set appropriate and reasonable peak-consumption reduction targets, and regularly monitor, track and publicly report on the progress made in meeting them.*

Status: Fully implemented.

Details

Our 2015 audit found that, although the OPA (now the IESO) advised the Ministry that a peak demand reduction of 1,800 MW by 2025 was a reasonable and prudent conservation target, the Ministry directed the OPA to set a target of 6,300 MW by 2025. In 2010, the Ministry further increased its target to 6,700 MW by 2025, and set an interim peak demand reduction target of 4,550 MW by 2015. An evaluation of OPA-managed programs showed that this interim target was not achieved by the end of 2014.

During our follow-up, the Ministry indicated that Ontario currently has a long-term peak reduc-

tion target to reduce peak electricity demand by 10% in 2025, equivalent to approximately 2,400 megawatts (MW) under 2013 forecast conditions. This target was set in the 2013 Long-Term Energy Plan (LTEP) and was expected to be met by using demand-response initiatives (programs that temporarily reduce electricity use during periods of peak demand), such as the Industrial Conservation Initiative, Capacity-Based Demand Response, demand response pilots and time-of-use pricing. The Ministry informed us that it will evaluate this target based on the supply and demand outlooks in the next LTEP, which was in the process of development during our follow-up and is expected to be completed in fall 2017.

The IESO has monitored the progress made in using demand-response initiatives to meet the 10% peak-demand reduction target. In its Ontario Planning Outlook report published in September 2016, the IESO noted that the total amount of demand response capacity in 2015 was about 1,700 MW.

The Environmental Commissioner of Ontario (ECO) has also monitored and publicly reported on the progress made in meeting this target in its Annual Energy Conservation Progress Report. Our review of the latest report released by the ECO in May 2016 found that, since several demand-response initiatives were still being developed in 2015, results were not available yet to determine the progress of achieving the target. The report also indicated that the target may be subject to change because it was set based on forecasts made in the 2013 LTEP.

As part of the development process of the next LTEP, the Ministry will evaluate the current peak-consumption reduction target.

Problems with Transmission System Planning

Recommendation 5

To ensure that Ontario's transmission system has sufficient capacity to reliably transfer electricity from the province's generators to where power is needed, the

Ministry of Energy should work with the Independent Electricity System Operator, Hydro One and other local distribution companies to:

- address current capacity and reliability issues, and identify what is required to support future electricity demand growth;

Status: In the process of being implemented in fall 2017.

Details

Our 2015 audit found capacity and reliability issues in a number of regions where the majority of transmission lines exceeded, reached or were close to reaching their capacity, and were not expected to be capable of meeting significant increases in peak demand. The OPA (now the IESO) identified these issues in its 2007 Integrated Power System Plan, which was never approved or implemented. Although work was under way at the time of our 2015 audit on projects to address these needs, the issues remained unresolved.

During our follow-up, the Ministry indicated that the LTEP will address capacity and reliability issues relating to transmission and distribution systems, and identify what is required to support future electricity demand growth.

As mentioned under the first action of **Recommendation 1**, the IESO submitted the OPO technical report on September 1, 2016, to the Ministry for it to use in developing the LTEP. We found that the OPO report included a series of modules that provide a detailed breakdown of the assumptions, facts and figures in the report. One of the modules—Market and System Operations and Transmission and Distribution Outlook—examined key planning and operational considerations, such as potential transmission investments to facilitate integration of new resources and associated impacts on the transmission and distribution systems.

In addition, the IESO has been working with local distribution companies and transmitters to ensure regional issues and requirements are integrated into electricity planning. At the time of

our follow-up, the first cycle of regional planning by the IESO was under way, covering 21 electricity regions across the province (based on electrical infrastructure boundaries). Regional planning will look at each region's unique needs and consider conservation, generation, transmission and distribution to meet these needs. Electricity needs in all regions will be reviewed every five years or sooner, if needed. The IESO has posted on its website the status of regional planning activities, including specific regional updates and plans. The OEB has also posted on its website the annual reports filed by transmitters showing the status of their regional planning.

At the time of our follow-up, the Ministry was in the process of developing the LTEP, which it expected to complete in fall 2017.

- investigate the root causes of the increasing volume of generator constraints and thereby minimize any unnecessary cost to electricity consumers;

Status: In the process of being implemented by 2021.

Details

Our 2015 audit found that changes in regional demand and changes in supply mix to support the phasing out of coal, along with significant increases in renewable energy, changed the flow patterns in the power system, contributing to increases in transmission constraints. The amount of compensation the IESO had to pay generators also increased, because generators are usually entitled to compensation payments when the IESO is required to constrain the output of generation facilities.

As mentioned under the second action of **Recommendation 3**, in 2016, the IESO initiated the Market Renewal Project, which is a multi-year project over the period from 2017 to 2021 with the objective of delivering “a more efficient, stable marketplace with competitive and transparent mechanisms that meet system and participant needs at the lowest cost.” The Ministry indicated

that the Project will investigate the root causes of the increasing volume of generator constraints and introduce specific measures to address the issue in order to minimize unnecessary costs to electricity consumers going forward.

As an initial step, the IESO has engaged a third party to conduct a cost/benefit assessment to understand the net benefits from the proposed design of the Project. According to the assessment report completed in April 2017, the volume of generator constraints and associated electricity costs can be reduced through changes to the current system used by the IESO in administering the electricity market and determining electricity prices. At the time of our follow-up, the IESO was in the process of engaging with stakeholders to build consensus for and public awareness of the design and implementation of the Project.

- *perform adequate system planning and analysis prior to undertaking any major initiatives that would impact transmission.*

Status: In the process of being implemented in fall 2017.

Details

Our 2015 audit found that the lack of a structured, co-ordinated planning process had ongoing negative effects on the performance of the transmission system. For example, many renewable energy

projects could not proceed because there was not enough transmission capacity. In addition, although importing power from neighbouring jurisdictions would have been a viable alternative to procuring renewable energy sources, there was no cost/benefit analysis of increasing transmission capacity to accommodate imports.

During our follow-up, the Ministry indicated that the LTEP will include system planning and analysis prior to undertaking initiatives that would impact transmission. The LTEP will further address the reliability of energy supply and capacity, transmission and distribution. At the time of our follow-up, the LTEP was in the process of being developed and was expected to be completed in fall 2017.

In addition, the Ministry indicated that, at a regional level, the electricity needs of all of Ontario's 21 planning regions have been evaluated over the past three years. This evaluation focused on each region's unique needs and considered conservation, generation, transmission and distribution, and innovative resources to meet these needs. The Ministry also noted that Integrated Regional Resource Plans and Regional Infrastructure Plans have been completed and are publicly available on the IESO's and Hydro One's websites, respectively. Our review found that these plans included transmission impacts, among other considerations.