

Chapter 3

Ministry of Energy

Section 3.02

Electricity Power System Planning

Standing Committee on Public Accounts Follow-Up on Section 3.05, 2015 Annual Report

The Committee held a public hearing in November 2016 on our 2015 audit of Electricity Power System Planning. It tabled a report in the Legislature resulting from this hearing in March 2017. The report can be found at www.auditor.on.ca/en/content/standingcommittee/standingcommittee.html.

The Committee made 10 recommendations and asked the Ministry of Energy (Ministry) and the Independent Electricity System Operator (IESO) to report back by the end of July 2017. The Ministry

and the IESO formally responded to the Committee on July 27, 2017. A number of issues raised by the Committee were similar to the observations we made in our 2015 audit. The status of the Committee's recommendations is shown in **Figure 1**.

We conducted assurance work between April 1, 2017 and August 4, 2017, and obtained written representation from the Ministry and the IESO that, effective September 1, 2017, they have provided us with a complete update of the status of the recommendations made by the Committee.

Figure 1: Summary Status of Actions Recommended in March 2017 Committee Report

Prepared by the Office of the Auditor General of Ontario

	# of Actions Recommended	Status of Actions Recommended			
		Fully Implemented ¹	In Process of Being Implemented ²	Little or No Progress	Will Not Be Implemented
Recommendation 1	1		1		
Recommendation 2	1				1
Recommendation 3	1		1		
Recommendation 4	1		1		
Recommendation 5	2		2		
Recommendation 6	1	1			
Recommendation 7	1	1			
Recommendation 8	1	1			
Recommendation 9	1	1			
Recommendation 10	1	1			
Total	11	5	5	0	1
%	100	46	45	0	9

1. Some recommendations required the Ministry or the IESO to provide information to the Committee. If the information was provided, we categorized it counted as "fully implemented."

2. Recommendations 1, 3, 4 and 5(b) will be implemented with the release of the Long-Term Energy Plan, which at the time of our follow-ups was expected to occur in fall 2017.

Overall Conclusion

According to the information the Ministry and the IESO provided to us, as of August 4, 2017, 46% of the Committee's recommendations have been fully implemented, a further 45% of the recommendations were in the process of being implemented and the remaining 9% of recommendations will not be implemented.

Detailed Status of Recommendations

Figure 2 shows the recommendations and the status details that are based on responses from the Ministry and the IESO, and our review of the information they provided.

Figure 2: Committee Recommendations and Detailed Status of Actions Taken

Prepared by the Office of the Auditor General of Ontario

Committee Recommendation	Status Details
<p>Recommendation 1</p> <p>The Ministry of Energy provide the Committee with details on how it will include in its future Long-Term Energy Plans justification for all power decisions made, detailed technical plans and cost benefit analyses of alternatives in a transparent manner.</p> <p>Status: In the process of being implemented in fall 2017.</p>	<p>Subsequent to our audit, the <i>Energy Statute Law Amendment Act, 2016</i> was proclaimed into force on July 1, 2016. Under the new legislation, the IESO is required to develop a technical report, which is the first step and the basis for the Ministry to develop the Long-Term Energy Plan (LTEP).</p> <p>On September 1, 2016, the IESO submitted its technical report, Ontario Planning Outlook (Technical Report), to the Ministry. The Technical Report presented different future outlooks and scenarios for the energy sector over 20 years, from 2016 to 2035, taking into consideration different levels of energy demand and different technologies in energy supply. For outlooks and scenarios where new energy supply may be required, the Technical Report included different alternatives and compared them from cost and emissions perspectives. The IESO also developed seven modules with data and analyses used in the Technical Report. One of the modules illustrated the cost of the power system across different demand outlooks and different supply options.</p> <p>In addition to the Technical Report, the Ministry also engaged a third party to prepare another technical report, the Fuel Technical Report (Fuel Report), which was released on September 30, 2016. It provides a review of fuel consumption and outlooks from 2016 to 2035.</p> <p>To ensure transparency, both the Technical Report and Fuel Report were posted on the Ministry's website prior to a public consultation and engagement process, which took place from October 2016 to January 2017 as part of the development of the LTEP. 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 posted all information and data used in the development of the LTEP on its website.</p> <p>At the time of our follow-up, the Ministry was in the process of developing the LTEP based on information from the Technical Report and Fuel Report as well as feedback from the public consultations. It expected to release the LTEP in fall 2017.</p>

Committee Recommendation	Status Details
<p>Recommendation 2</p> <p>The Ministry of Energy provide the Committee with details on how future Long-Term Energy Plans will be independently reviewed to ensure that they are prudent and cost effective in order to protect the interest of electricity consumers.</p> <p>Status: Will not be implemented.</p>	<p>The new <i>Energy Statute Law Amendment Act, 2016</i> has changed the electricity planning process in Ontario. As mentioned under Recommendation 1, the Ministry is responsible for developing the LTEP after thorough consideration of the IESO's Technical Report, as well as feedback from the public consultation and engagement process.</p> <p>To ensure that the government's goals and expectations outlined in the LTEP are implemented, the Minister of Energy intends to issue directives to the Ontario Energy Board (OEB) and the IESO once the LTEP is finalized and released. The directives set out the government's requirements for implementation and direct each agency to develop implementation plans. Upon receiving an implementation directive, the two agencies are to develop their respective implementation plans outlining frameworks on how to implement the government's objectives and requirements laid out in the LTEP.</p> <p>While the 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 independent review and approval to ensure that the LTEP is prudent and cost effective. The OEB is only responsible for preparing an implementation plan when the Ministry requests it, through the issuing of a ministerial directive to the OEB, 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.</p>
<p>Recommendation 3</p> <p>The Ministry of Energy provide the Committee with details on how it will be transparent about the cost impact of power decisions to the ratepayers, in addition to informing the public about the rationale for its directives.</p> <p>Status: In the process of being implemented in fall 2017.</p>	<p>Under the new <i>Energy Statute Law Amendment Act, 2016</i>, all directives and directions sent to the IESO have been and are to continue being publicly posted on the IESO's website to ensure transparency. The Ministry has issued seven directives to the IESO subsequent to our 2015 audit. Our review of these directives found that they included background information and details that explained the context and rationale for policy objectives, informing the public about the rationale for any decisions made.</p> <p>As mentioned under Recommendation 1, the Ministry was in the process of developing the LTEP based on information from the IESO's Technical Report and feedback from public consultation. The IESO also developed seven modules with data and analyses used in its Technical Report. One of the modules illustrated the cost of the power system across different demand outlooks and different supply options. To ensure transparency about the cost impact of the LTEP to ratepayers, the Ministry is required by the <i>Electricity Act, 1998</i> to post all information and data used in the development of the LTEP on its website. The LTEP is expected to be released in fall 2017.</p> <p>In addition to the Ministry's development of the LTEP, the IESO has 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, this multi-year Project's design and implementation are to run from 2017 to 2021. It is intended that the Project will also help improve transparency about the cost impact of power decisions on ratepayers in the future. During 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.</p>

Committee Recommendation	Status Details
<p>Recommendation 4</p> <p>The Ministry of Energy provide the Committee with details of how it will make sure future power generation decisions are supported by IESO's technical expert advisors and how it will inform the public about the rationale for any power decisions made that deviate from IESO's recommendations.</p> <p>Status: In the process of being implemented in fall 2017.</p>	<p>As mentioned under Recommendation 1, under the new <i>Energy Statute Law Amendment Act, 2016</i>, the IESO is required to develop a technical report, which is the first step and basis for the Ministry to develop the LTEP.</p> <p>The Ministry indicated that the IESO's technical report, as described in the <i>Electricity Act</i>, is intended to outline the adequacy and reliability of electricity resources. In other words, the IESO's technical report is intended to inform the LTEP's public consultation and engagement process and subsequent decisions made by the Ministry, but it is not intended to provide recommendations. Since the IESO's technical report, <i>Ontario Planning Outlook</i>, does not contain any recommendations, the Ministry will not be providing the public with the rationale for decisions that deviate from IESO recommendations.</p> <p>In addition, as mentioned under Recommendation 2, the Minister of Energy will issue directives to the OEB and the IESO once the LTEP is finalized and released. The directives set out the government's requirements for implementation and direct each agency to develop implementation plans to ensure that the government's goals and expectations outlined in the LTEP are implemented. The Ministry indicated that the LTEP and the IESO and OEB implementation directives and plans are intended to work together to articulate a policy vision and give the IESO and OEB operational flexibility to determine the best course of action.</p> <p>Furthermore, the Ministry indicated that it will continue to support the IESO's Market Renewal Project, as previously noted under Recommendation 3, which will help ensure that future power generation decisions are supported by the IESO's expert advisors. The Project's objective is to ensure that future decisions on the power system will be determined using market-based mechanisms to reduce system costs, improve transparency and provide flexibility as Ontario's power system needs evolve.</p>

Committee Recommendation	Status Details
<p>Recommendation 5 The Ministry of Energy, or the IESO, as applicable</p> <p>a) provide the Committee with details on how it evaluates proposals for investing in generation facilities compared to investing in conservation initiatives (e.g., business case, cost benefit analysis); and Status: In the process of being implemented by 2021.</p> <p>b) provide the Committee with an assessment of the anticipated impacts conservation initiatives will have on electricity costs during surplus generation periods over the long-term. Status: In the process of being implemented in fall 2017.</p>	<p>a) 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 (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. Under the Framework, conservation programs are required to pass cost-effectiveness tests prior to being approved and are subject to the Evaluation, Measurement and Verification 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.</p> <p>In addition, as part of the IESO's Market Renewal Project (as mentioned under Recommendation 3), future electricity generation will be procured via competitive market mechanisms based on supply and demand outlooks, which include conservation initiatives. In other words, the cost-effectiveness of conservation initiatives will be taken into consideration as part of the process for deciding on investments in generation facilities and procuring electricity supply.</p> <p>b) The Ministry indicated that, as part of the development of 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.</p>

Committee Recommendation

Status Details

Recommendation 6

The IESO provide the Committee with a progress update on the regional capacity and reliability issues identified in the Auditor General's report.
Status: Fully implemented.

Both the Ministry and the IESO responded to this recommendation and provided the following information.

The IESO provided a progress update on the regional capacity and reliability issues identified in our 2015 audit. Specifically:

- **Kitchener-Waterloo-Cambridge-Guelph (KWCG) region:** The 2015 KWCG Integrated Regional Resource Plan identified a number of actions, including the implementation of the Guelph Area Transmission Refurbishment project (which came into service in 2016) and switching facilities at Galt Junction (which are to be in service by the fall of 2017). These projects are expected to provide sufficient capacity to support the increase of demand over the long term and will help minimize the impact of supply interruption in the area. The next regional planning cycle for the KWCG area is to be initiated in 2018.
- **Windsor-Essex region:** In 2014, Hydro One submitted an application to the OEB for leave to construct the Supply to Essex County Transmission Reinforcement (SECTR) project, consisting of a new 230 kV supply station located near Leamington and a 13-km connection line. The SECTR project addresses two regional planning needs: the need for additional supply capacity in the Kingsville-Leamington area, and the need for additional restoration capability in the broader Windsor-Essex area. In July 2015, the OEB approved the SECTR project, and Hydro One initiated construction in 2016. The project is scheduled to be in service by summer 2018.
- **Northwest GTA region:** To deal with the growing electrical demand to service new customers in Northwest GTA over the next 20 years, the near- and medium-term solutions include incorporating new transformer stations at existing sites and upgrading existing transmission circuits. The IESO forecasted that the first transformer station will be in service in 2019. Actual electrical demand in the area continues to be monitored to determine when additional measures will be required. In the long term, a new transmission system will be required to meet demand from new developments in the northern Brampton and southern Caledon areas. The IESO continues to work with industry partners and the appropriate provincial and municipal government groups to secure rights adjacent to other planned infrastructure corridors.

In addition to the progress update provided by the IESO, the Ministry also indicated that the LTEP will address capacity and reliability issues relating to transmission and distribution systems. Specifically:

- As mentioned under **Recommendation 1**, the IESO submitted its Technical Report to the Ministry for use in developing the LTEP. The IESO also developed seven modules with data and analyses used in the Technical Report. One of the modules—Market and System Operations and Transmission and Distribution Outlook—examined key planning and operational considerations related to transmission and distribution systems to address regional capacity and reliability.
- The development of the LTEP has included a regional planning process to address current capacity and reliability issues. The IESO has been working with local distribution companies and transmitters to ensure regional issues and requirements are integrated into electricity planning. During our follow-up, the first cycle of regional planning by the IESO was under way, covering 21 electricity regions across the province. 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 are to 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.

Committee Recommendation	Status Details
<p>Recommendation 7</p> <p>The IESO provide the Committee with the results of the March 2016 stakeholder engagement on market renewal and next steps.</p> <p>Status: Fully implemented.</p>	<p>The IESO began discussions with stakeholders in April 2016 about developing the Market Renewal Project (Project) (as noted under Recommendation 3). The focus of these initial discussions was to address known issues with the current design of the electricity market; recognize the significant changes that have taken place in the supply mix and in new technologies; and ensure that the market will support future change.</p> <p>A key element in the first phase of engagement on the Project was to develop a benefits case that looked at the proposed market changes, considered the experience of other jurisdictions in making similar changes and their applicability to Ontario, and then estimated the range of potential net benefits that might accrue from these changes. The IESO retained a third party to prepare the benefits case analysis; this was developed over an eight-month period and was supported by internal and external stakeholder consultations. The analysis determined that the proposed changes would result in net benefits and in a more efficient and stable marketplace with competitive and transparent mechanisms. The final benefits case was published on April 20, 2017.</p> <p>Early in the consultations, stakeholders identified the need for a working group to support in-depth discussion on technical, strategic and policy issues related to the Project. In response, the IESO solicited nominations for participation in a Market Renewal Working Group (Working Group). Over the course of the initial engagement, the Working Group played a key role in providing input into the development of the benefits case and in identifying early strategic issues related to the Project. Going forward, the Working Group is to continue to serve as a representative stakeholder forum to guide, advise and inform the IESO on important issues that will impact the overall success of the Project.</p> <p>At the time of our follow-up, the IESO and stakeholders were moving into the design phase of the Project. In early May 2017, the IESO launched stakeholder engagements for two initiatives (the Single Schedule Market and Incremental Capacity Auction) and intended to launch engagements for additional initiatives later in 2017. The IESO expects to have developed high-level designs for six different initiatives by the end of the second quarter of 2018.</p>

Committee Recommendation	Status Details
<p>Recommendation 8</p> <p>The Ministry of Energy provide the Committee with details on how future Long-Term Energy Plans will be independently reviewed to ensure that they are prudent and cost effective in order to protect the interest of electricity consumers.</p> <p>Status: Fully implemented.</p>	<p>The Ministry provided the following cost information related to the Darlington refurbishment project:</p> <ul style="list-style-type: none"> • The Ontario Power Generation’s (OPG) 2017-2021 rate application submitted to the OEB indicated that Darlington refurbishment is expected to be complete by 2026, and the Pickering station is expected to operate up to 2022/24 (two units will be shut down in 2022 and the remaining four units will be shut down in 2024) and then be decommissioned. • The OPG estimated that the average cost of Darlington over 30 years, during post-refurbishment operation, would range from 7.2 cents to 8.1 cents per kWh (in 2015 dollars). • In December 2016, the Ministry and the IESO provided the Committee with the OPG’s nuclear rate assumptions from 2016 to 2036, which had been used by the IESO in its Technical Report and by the OPG in its 2017-2021 rate application submitted to the OEB. • On March 2, 2017, the government filed an amendment to O. Reg. 53/05 under the Ontario Energy Board Act, 1998 to ensure that the OEB further reduce the volatility in electricity rates for Ontario ratepayers during Darlington’s refurbishment. As a result, on March 8, 2017, the OPG filed a revised rate-smoothing proposal with the OEB, in line with the regulation amendment. • The Ministry provided the OPG’s estimates for its annual nuclear rates as well as average nuclear rates for each of the five-year periods from 2017 to 2036, underlying the OPG’s 2017-2021 rate application filed with the OEB on March 8, 2017. (See Note 1.)

Committee Recommendation	Status Details
<p>Recommendation 9</p> <p>The Ministry of Energy provide the Committee with the impact the delayed refurbishment of nuclear units at Bruce and continued operation of Pickering Generation Station have on surplus power and its associated cost to the ratepayers. Status: Fully implemented.</p>	<p>Both the Ministry and the IESO responded to this recommendation and provided the following information:</p> <p>The Ministry indicated that the IESO’s Technical Report incorporated in its supply outlook the ongoing operation of the Pickering nuclear plant up to 2022/24 (two units will be shut down in 2022 and the remaining four units will be shut down in 2024) and the latest Bruce refurbishment schedule (showing the first Bruce unit to be refurbished in 2020). The Technical Report also included a range of demand outlooks (low, flat and high), and indicated that about 3,100 MW of capacity would be lost after shutting down and decommissioning Pickering in 2022/24. The Ministry did not have estimates for costs associated with surplus power resulting from ongoing Pickering operations and delayed Bruce refurbishment, so it directed us to the IESO for this information.</p> <p>The IESO informed us that its Technical Report included a module, Market and System Operations & Transmission and Distribution Outlook, which presented the results of the IESO’s most recent assessment of surplus power. This included consideration of the impact of the deferred refurbishment of Bruce nuclear units and continued operation of Pickering to 2022/24. Key results of the IESO’s assessments are as follows:</p> <ul style="list-style-type: none"> • To maintain a reliable and stable system, supply and demand must be kept in balance, requiring surplus energy mitigation tactics. Currently, most of Ontario’s surplus is managed economically through the market via exports to neighbouring jurisdictions. The remaining surplus power is managed by diverting water from hydro turbines (“hydro spill”), curtailing wind and solar generation, and maneuvering or shutting down units at the Bruce nuclear generating station. • Surplus power levels would decline over time as units from the Pickering nuclear generating station retire and as units at Darlington and Bruce are brought out of service for refurbishment. • The IESO estimated that from 2016 to 2035, surplus power (under the flat demand outlook) would decrease from 13.3 TWh in 2016 to 3.7 TWh in 2035. <p>The IESO’s assessment of the Pickering station’s extended life and the associated impacts on surplus power, including costs to consumers, can be found in the OPG’s rate application (EB-2016-0152) submitted to the OEB.</p> <p>In March 2015, upon the Ministry’s request, the IESO provided an assessment of the impacts of extending the Pickering station’s life under various scenarios between 2018 and 2024. The IESO concluded that the scenario of Pickering operating to 2022/24 appeared most promising among the extension options assessed. In October 2015, the IESO updated its evaluation of the Pickering extension, with particular focus on the option of extending to 2022/24.</p> <p>With respect to the impact on surplus power of the Pickering extension, the IESO’s assessment noted that extending Pickering operations beyond 2020 would increase potential surplus energy. It also estimated that the cost of surplus power would decrease between 2017 and 2020, and then increase from 2021 to 2024. The IESO’s assessment results can be found in the OPG’s rate application (EB-2016-0152 Exhibit F2-2-3 Attachment 1 and EB-2016-0152, Exhibit L, Tab 6.5 Schedule 7 ED-032) on OEB’s website www.oeb.ca.</p> <p>While the IESO indicated that it has not formally assessed the impact of deferred refurbishment of nuclear units at Bruce on surplus power and its associated costs to ratepayers, it expected that the Bruce deferral would have the effect of reducing surplus power in the longer term.</p>

Committee Recommendation	Status Details
<p>Recommendation 10</p> <p>The Ministry of Energy provide the Committee with quarterly progress updates on the current Darlington refurbishment. Status: Fully implemented.</p>	<p>The Ministry indicated that as of the start of the refurbishment of the first unit at Darlington (Unit 2) in October 2016, the OPG has been providing monthly status updates on the progress of the refurbishment.</p> <p>The monthly reports track the progress of the project against key performance indicators, including safety, quality, schedule and cost, and highlight key project milestones achieved as well as challenges faced. The latest monthly progress reports are publicly available on OPG’s website www.opg.com/Pages/home.aspx.</p>

Note 1: Rate (Cents/kWh)

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Annual Nuclear	7.6	7.9	8.5	8.8	9.2	10.4	12.6	12.5	16.5	16.1
5-Year Average			8.4					13.6		
	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Annual Nuclear	16.1	15.0	14.5	14.2	14.1	13.7	13.4	13.3	12.8	12.5
5-Year Average			14.8					13.1		