

**Undertakings from Public Accounts Committee: Wednesday,
November 16, 2016 – 2 p.m:**

	Ask	Undertaking	Suggested Response
1	MPP Peter Tabuns: What cost of electricity as a result of the Darlington refurbishment was assumed by IESO in OPO modelling 7.9C/KW? 16C/KW?	IESO stated that they would confirm for MPP Tabuns the final figure assumed.	
2	MPP Peter Tabuns: Can you provide additional details regarding the projected cost of electricity as a result of the Darlington refurbishment, over the next 15 years?	Deputy Minister said projection information is set out in Tables and Modules in the 2013 LTEP, and that he/IESO would provide this information to MPP Tabuns	
3	MPP Peter Tabuns: When will the \$2.45 savings as a result of the suspension of LRP II be in effect?	Deputy Minister stated this had been previously requested in Estimates and he would provide to MPP Tabuns again	
4	MPP Peter Tabuns: Can you provide the IESO module related to the cost of electricity as a result of the Darlington refurbishment?	Deputy Minister said this material is publicly available, but he would provide this information to MPP Tabuns	
5	MPP Peter Tabuns: Can you confirm that the \$12.8B figure for Darlington includes funding associated with rate-smoothing initiatives?	Deputy Minister said the \$12.8B figure likely includes this funding, and said he would confirm and get back to MPP Tabuns.	
6	MPP Peter Tabuns: Can you provide the analysis that outlines the business case for the extension of the Pickering plant?	Deputy Minister said that this analysis had already been provided but would provide to MPP Tabuns again.	
7	Supplementary – by letter from Committee Cost of Global Adjustment – 2006-2014		

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8	Confirm Gas Prices per kilowatt Hour (RPP report October 19, 2016 shows gas prices at 17.3 cents per kilowatt hour)		
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ASK 1:

IESO to Respond.

ASK 2:

Can you provide additional details regarding the projected cost of electricity as a result of the Darlington refurbishment, over the next 15 years?

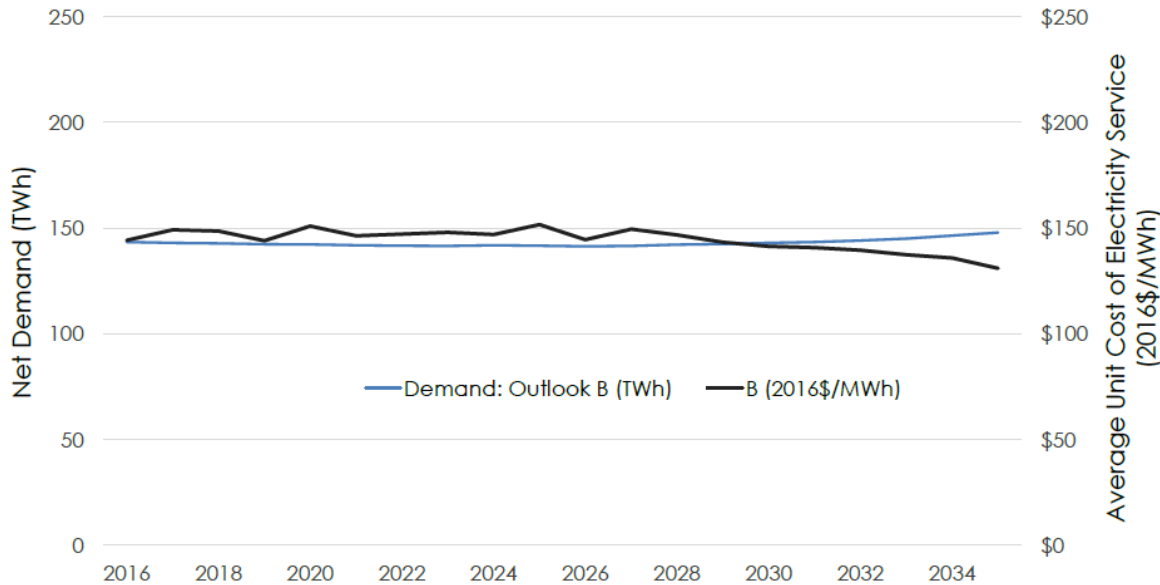
Projection information as set out in the five modules in the 2013 LTEP:

- Below is a link to the 2013 LTEP, along with those 5 supporting modules.
<http://www.powerauthority.on.ca/power-planning/long-term-energy-plan-2013>
- In the *Ontario Planning Outlook* (OPO), IESO provided the projected cost of electricity as a result of potential supply mix choices in response to four demand outlook scenarios.
- The four outlooks for Ontario's electricity demand are:
 - **Outlook 'A' (or "low demand outlook")**, which explores the implications of lower electricity demand;
 - **Outlook 'B' (or "flat demand outlook")**, which explores a level of long-term demand that roughly matches the level of demand that exists today; and
 - **Outlooks 'C' and 'D' (or "higher demand outlooks")**, which explore higher levels of demand driven by different levels of electrification associated with policy choices on climate change.
- Outlook 'B' assumes that Ontario proceeds with refurbishing all ten units at Darlington and Bruce, and that Pickering continues to operate up to 2024 (subject to regulatory and government approvals). Note: Outlook 'B' does not include any new nuclear capacity.
- The following Chart and Table provide the projected unit cost of electricity between 2016 and 2035 based on Outlook 'B' (source: OPO Module 7).

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- IESO has utilized OPG's regulated nuclear rates - as forecast by OPG - in developing its system cost projections (Note: please see response to Ask 1 for additional details).

Average Unit Cost of Electricity Service: Outlook B



Average Unit Cost of Electricity Service: Outlook B

Average Unit Cost of Electricity Service	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Demand: Outlook B (TWh)	143	143	143	142	142	142	142	142	142	142
B (2016\$/MWh)	\$144	\$149	\$149	\$144	\$151	\$146	\$147	\$148	\$147	\$152
Average Unit Cost of Electricity Service	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Demand: Outlook B (TWh)	141	142	142	142	143	143	144	145	146	148
B (2016\$/MWh)	\$145	\$150	\$147	\$143	\$141	\$141	\$140	\$137	\$136	\$131

- Comprehensive analysis and data on Outlook 'B' and other outlooks can be found in IESO OPO report and accompanying Modules, such as Modules 4 and Module 7.
 - Ontario Planning Outlook (OPO): <http://ieso.ca/Documents/OPO/Ontario-Planning-Outlook-September2016.pdf>
 - Module 4: <http://ieso.ca/Documents/OPO/MODULE-4-Supply-Outlook-20160901.pdf>
 - Module 7: <http://ieso.ca/Documents/OPO/MODULE-7-Electricity-System-Cost-Outlook-20160901.pdf>
 - All OPO related documents and data are available for download at: <http://ieso.ca/Pages/Ontario%27s-Power-System/Ontario-Planning-Outlook/default.aspx>

ASK 3:

When will the \$2.45 savings as a result of the suspension of LRP II be in effect?

- According to IESO calculations, suspending LRP II and the Energy-from-Waste Standard Offer Program is expected to save up to \$3.8 billion in electricity system costs relative to the 2013 Long-Term Energy Plan (LTEP) forecast. The IESO estimates that this would save the typical residential electricity consumer an average of approximately \$2.45 per month on their electricity bill.
- As the approximately \$2.45 monthly cost saving estimate is an average of ratepayer savings over the forecast period, cost savings in any given month would vary depending on the projects online at that time.
- The Minister's April 5, 2016 direction to the IESO requested that LRP II contract offers be issued by May 1, 2018.
 - Consequently, projects would be expected to have come online in 2021/2022, with the exception of any waterpower projects which typically involve longer timelines for development and construction.
 - Impacts on bills would have begun to reflect costs associated with this generation as projects came into commercial operation, continuing for the duration of the contracts, 20 years for wind and solar.

Internal note for DM on in-service dates:

- IESO provided the following table of assumed online dates for the purposes of their \$3.8 billion, \$2.45/month cost savings calculation. These dates differ from those provided in response #1 above since the IESO dates reflect timing anticipated at the time of developing LTEP 2013 where response #1 reflects the actual timing of LRP II contract offers in May 2018 (different from LTEP 2013 assumptions).

	Commencement of LRP projects in 2013 LTEP
SOLAR	2016 to 2018
WIND	2018 to 2020
HYDRO	2022 to 2025
BIOMASS	2019

- IESO explained that to produce the impact of removing LRP II, the 980 MW of LRP II capacity was removed from the later installed LRP capacity assumed in LTEP 2013.

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- In order to provide a comparison to the original LTEP 2013 projections, the IESO used in-service dates that were consistent with those original projections. Comparisons to LTEP 2013 projections are consistent with the way the Ministry has communicated cost reductions and ratepayer impacts in the past. LTEP 2013 included long term supply and demand forecasts. By using LTEP 2013 as a baseline it allows for the removal of planned procurement to be understood as part of the larger supply forecast.
- If the actual expected in-service dates of LRP II projects were to be contemplated as part of a contract value calculation, this could not be compared to the LTEP 2013 baseline projections.

ASK 4:

Can you provide the IESO module related to the cost of electricity as a result of the Darlington refurbishment?

- **Please see response to Ask 2 (links included)**

ASK 5:

Can you confirm that the \$12.8B figure for Darlington includes funding associated with rate-smoothing initiatives?

- The \$12.8 billion is the final approved budget for the refurbishment of four nuclear units at the Darlington Nuclear Generating Station, including interest and escalation.
- Nuclear rate smoothing is not related to the \$12.8 billion budget, rather, it is related to the way in which OPG recovers its nuclear costs and investments (e.g., Darlington refurbishment) through its nuclear rates set by the Ontario Energy Board (OEB).
- OPG's regulated nuclear rates – which include both Darlington and Pickering - are derived using a "cost of service" methodology. This methodology uses forecasts of OPG's nuclear-related costs and nuclear production over the applicable rate-setting period (e.g., five years) to determine OPG's "revenue requirement" to be recovered through its nuclear rates.
- As such, the expected capital investment in Darlington refurbishments (i.e., \$12.8 billion) will be reflected in OPG's total revenue requirement across the 2017-2021 and 2022-2026 rate setting periods. The revenue requirement during these rate-setting periods will also reflect normal operating costs for OPG's nuclear business (e.g., costs associated with the operating Darlington and Pickering units) and costs associated with the permanent shutdown of Pickering (e.g., staff severance costs).

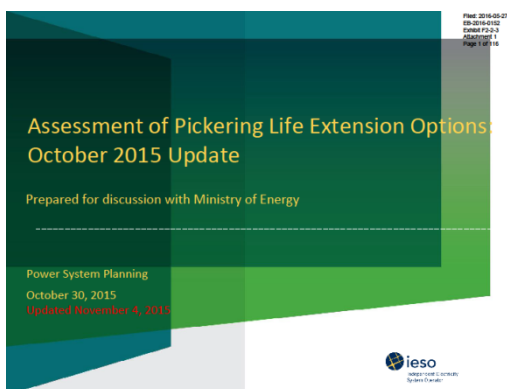
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- To reduce rate volatility for the benefit of ratepayers during the Darlington refurbishment period, the government amended Ontario Regulation 53/05 to allow for nuclear rate-smoothing (i.e., deferred recovery of a portion of OPG's nuclear revenue requirement until after the refurbishment project is complete).
- OPG's rate application is currently in progress. Ultimately, the OEB will decide what the regulated nuclear rate should be based on its public and transparent rate-setting process – including what the appropriate nuclear costs and production forecasts are for the 2017-2021 period and how nuclear rate-smoothing (e.g., the year over year increase in nuclear rate) should be applied in recovering the approved costs.
- Note that the OEB will only approve Darlington refurbishment costs for recovery as part of the current and future rate applications that it deems to have been “prudently incurred” by OPG.

ASK 6:

Can you provide the analysis that outlines the business case for the extension of the Pickering plant?

- IESO has undertaken an independent assessment of the integrated power system impacts from ongoing Pickering operation.
- This analysis was filed by OPG with the OEB, as part of Exhibit F2-02 in OPG's 2017-2021 Rate Application and is available on the OEB website here (pp. 45 -160):
<http://www.rds.ontarioenergyboard.ca/webdrawer/webdrawer.dll/webdrawer/rec/529935/view/>
- The IESO analysis has been extracted from the above-mentioned document and attached below (double-click on the image).



ASK 7:

Please provide a table showing the cost of the global adjustment over the period 2006 to 2014 for all those elements in the system that are financed by the global adjustment.

Global Adjustment Rates: 2006 - 2014	
Year	Total (M\$)
2014	7,034.90
2013	7,727.30
2012	6,455.70
2011	5,309.60
2010	3,847.70
2009	4,219.50
2008	900.70
2007	597.00
2006	654.00
Source: IESO	

ASK 8:

Can you confirm the electricity prices per kilowatt hour for natural gas generators? The Ontario Regulated Price Plan Report, October 19, 2016, shows prices at 17.3 cents per kilowatt hour

- The 17.3 cents per kilowatt hour in the Ontario Energy Board's (OEB) regulated price plan report is an estimate of the per unit cost of electricity generation from natural gas plants over the period of November 1, 2016 to October 31, 2017. Per unit costs include both global adjustment (GA) and market price payments.
- Per unit cost is not an accurate metric to compare peaking facilities as such calculations do not account for the peaking and ramping benefit that these generating facilities provide to the electricity system. Peaking facilities are generally compared on a capacity basis (i.e., \$/MW-year).
- Unit costs can vary based on contract terms of each generator. The Independent Electricity System Operator's (IESO) 2016 Ontario Planning Outlook (OPO) indicates that the levelised unit energy cost (LUEC) for natural gas is between 8 cents and 31 cents per kilowatt hour.

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