



EB-2016-0152

Ontario Power Generation Inc.

**Application for payment amounts for the period from
January 1, 2017 to December 31, 2021**

**DECISION AND ORDER ON MOTION
FILED BY ENVIRONMENTAL DEFENCE**

February 16, 2017

Ontario Power Generation Inc. (OPG) filed an application with the Ontario Energy Board (OEB) on May 27, 2016 under section 78.1 of the *Ontario Energy Board Act, 1998*, S.O. 1998, c. 15 (Schedule B), seeking approval for changes in payment amounts for the output of its nuclear generating facilities and most of its hydroelectric generating facilities. The request seeks approval for nuclear payment amounts to be effective January 1, 2017 and for each following year through to December 31, 2021. The request seeks approval for hydroelectric payment amounts to be effective January 1, 2017 to December 31, 2017 and approval of the hydroelectric payment amount setting formula for the period January 1, 2017 to December 31, 2021.

Pursuant to Procedural Order No. 4, on December 2, 2016 the OEB received notices of motion from the School Energy Coalition (SEC)¹, Environmental Defence (ED) and the Green Energy Coalition (GEC). In this decision the OEB addresses ED's motion.

¹ In reply submission OPG agreed to provide the information that was requested by SEC in interrogatory L-11.1-SEC-95 and the requested information was filed on Dec 22, 2016. Therefore, no further action is required by the OEB on this matter.

On December 9, 2016, the OEB received submissions from OEB staff in support of ED's motion. On December 13, 2016, the OEB received submissions from OPG opposing ED's motion. On December 16, 2016, the OEB held an oral hearing on the motions.

ED's motion is for an order of the OEB requiring OPG to provide full and adequate responses to seven interrogatories and two undertakings. The questions relate to OPG's proposal to extend operation of the Pickering Nuclear Generating Station (Pickering) to 2022/2024 ("Pickering Extended Operations" or "PEO") and fall under Issue 6.5: Are the test period expenditures related to extended operations for Pickering appropriate? The interrogatories and undertakings include:

- L-6.5, Schedule 7, ED Interrogatory No. 30
- L-6.5, Schedule 7, ED Interrogatory No. 33
- L-6.5, Schedule 7, ED Interrogatory No. 35
- L-6.5, Schedule 7, ED Interrogatory No. 28
- Undertakings JT 1.17 Part (G), (I) and (J)
- L-6.5-Schedule 7, ED Interrogatory No. 29
- L-6.5-Schedule 7, ED Interrogatory No. 39
- L-6.5-Schedule 7, ED Interrogatory No. 27
- Undertaking JT 2.05

The interrogatories and undertakings at issue request information from the IESO and OPG in respect of the assumptions in the IESO's cost-benefit analysis, that the cost-benefit analysis be updated using more recent assumptions and that the cost-benefit analysis be redone based on a different set of assumptions. OPG and the IESO have responded to some of the requests and declined others or declined to provide additional information on grounds that the information requested deals with system planning matters and/or is not within the scope of issue 6.5.

While OEB staff did not make any submissions on the specific matters in dispute concerning responses to the interrogatories and undertakings, it made extensive submissions on the general question of whether the OEB can undertake an assessment of need for Pickering as part of its review of issue 6.5.

FINDINGS

The general question concerning the scope of the OEB's review of Pickering Extended Operations will be addressed as part of the OEB's final decision in this proceeding. In this decision concerning the motions, the OEB will address the specific matters in dispute concerning responses to interrogatories and undertakings.

ED Interrogatory No. 30

In this interrogatory ED requests that the IESO's cost-benefit analysis in support of PEO be recalculated based on the IESO's best current estimate for the input variables. The interrogatory states:

Please re-calculate the net benefit of the Pickering extension to 2022/24 using the IESO's *best current estimates* for each year of:

- a) Pickering's available capacity (MW) at the time of Ontario's peak annual demand;
- b) Pickering's fuel and operating cost per kWh;
- c) Pickering's incremental capital expenditures to permit its extension to 2022/24;
- d) The natural gas price at Henry Hub;
- e) Ontario's carbon price;
- f) Ontario's incremental peaking requirements (MW) to meet the NPCC resource adequacy criterion if Pickering is not extended to 2022/24;
- g) Ontario's least-cost combination of resources to meet the NPCC resource adequacy criterion if Pickering is not extended to 2022/24.

Please also re-calculate the net benefit of the Pickering extension to 2022/24 using all of the above-noted assumptions with the following exception, namely, substitute the NYMEX natural gas futures prices at Henry Hub for the IESO's best estimate of the natural gas prices at Henry Hub.

Please fully describe your analysis and state and justify your assumptions.

In response to the interrogatory, the IESO stated that it has not updated the analysis and referred ED to the recently released Ontario Planning Outlook for the most current projections for electricity demand and supply.

ED submitted that the IESO's cost-benefit analysis was out of date and should be updated to reflect such things as the recent agreement to purchase hydroelectric power from Quebec and changes in natural gas prices. ED submitted that the work it was

asking the IESO to do was not an onerous undertaking. ED submitted that the information was relevant for testing the IESO's cost-benefit analysis and that it needed the information to make its argument that "Pickering should not receive costs on a \$/MWh basis that is higher than the least cost alternative"² (market price argument).

At the technical conference and in response to JT1.17 (L) OPG reiterated its original response and declined to update the analysis on grounds of relevance. In reply to the motion, OPG submitted that the IESO's cost-benefit analysis would take months to complete, that aspects of ED's request are factually wrong; that it has already filed both the original analysis, dated March 9, 2015, and the updated analysis, dated November 4, 2015, and that no further updates exist. OPG further submitted that the information requested is not relevant to the proceeding and therefore there is no basis for requiring the IESO to update its analysis.

FINDINGS

The OEB will not require the IESO to update the cost-benefit analysis as requested in the interrogatory for the reasons set out below.

The OEB notes that both the IESO's original analysis and its updated analysis have been filed in evidence. The IESO and OPG have submitted that no further updates have been prepared. The OEB accepts this response.

The analysis is done at a specific point in time. It will never remain static but will always be in need of updating. ED's request that the analysis be redone to reflect the recent agreement with Quebec would primarily involve an examination of system planning and be inconsistent with the scope of issue 6.5 – Are the test period expenditures related to extended operations for Pickering appropriate?

The scope of the OEB's review in issue 6.5 is to assess the appropriateness of the expenditures related to PEO. The IESO's cost-benefit analysis is helpful in explaining OPG's economic rationale for undertaking the expenditures but the OEB considers that an updated analysis would be of limited value in assessing whether the expenditures are reasonable, given the fact that the economic rationale is not the only relevant factor.

ED also requests that the analysis be updated to account for the change in natural gas prices. The OEB observes that the IESO's cost-benefit analysis provides some

² Notice of Motion of ED, paragraph 3

information on the impact of changes in natural gas prices. For example, on page 63 of the analysis the IESO states that the analysis is sensitive to gas prices and that PEO would be uneconomic if gas prices are below \$4/MMBtu. Further, in response to interrogatories, the IESO has provided a more recent forecast of natural gas prices. Taking these sources of information together, parties have sufficient information to address the issue of how the cost-benefit analysis will be impacted by a change in natural gas prices and an update is therefore not necessary.

ED also raised concerns with respect to operating and capital costs of Pickering. The OEB confirms that these matters are within the scope of its review of issue 6.5. The OEB however does not believe that the IESO's cost-benefit analysis needs to be redone to account for these variables. In that respect the OEB finds the spreadsheet that OPG has filed in response to ED interrogatory no. 27 to be helpful as it allows parties to assess the impact on the cost-benefit analysis that would result from changes in OPG costs. In denying the request to redo the analysis the OEB is also cognizant of the fact that an update could well take significant time to complete³.

The OEB also rejects the argument that the determination of Pickering operating costs should be based on a comparison with the least cost supply alternative. The OEB is open to considering arguments on appropriate cost containment measures to ensure efficient operation of Pickering, but does not consider that the market price argument is the appropriate way to achieve that outcome.

The OEB does not consider it helpful to require the IESO to re-run its analysis based on alternative or updated scenarios. However, the OEB would benefit from a better understanding of the cost-benefit analysis and other factors that the IESO finds relevant to the continued operation of Pickering. OPG and the IESO are directed to have an IESO witness available as part of the oral hearing. The purpose of having the witness available is for the OEB to gain a better understanding of the cost-benefit analysis completed by the IESO and the considerations around that analysis. The witness will not be required to opine on alternatives or updated system planning scenarios.

³ Motion Hearing Transcript, dated December 16, 2016, p. 92.

ED Interrogatory No. 33

The interrogatory states:

Please compare the option of Pickering GS shutting down on August 31, 2018 versus OPG's plan to operate it until 2022/2024 by providing a forecast for each relevant year of:

- a) Ontario's surplus base-load generation (MWh) due to Pickering's continued operation after August 31, 2018;
- b) Ontario's curtailed water power generation (MWh) due to Pickering's continued operation after August 31, 2018;
- c) Ontario's curtailed wind power generation (MWh) due to Pickering's continued operation after August 31, 2018;
- d) Ontario's curtailed solar power generation (MWh) due to Pickering's continued operation after August 31, 2018;
- e) Ontario's total revenue from its surplus base-load generation due to Pickering's continued operation after August 31, 2018;
- f) The cost to Ontario's electricity consumers of Ontario's curtailed water power generation due to Pickering's continued operation after August 31, 2018;
- g) The cost to Ontario's electricity consumers of Ontario's curtailed wind power generation due to Pickering's continued operation after August 31, 2018;
- h) The cost to Ontario's electricity consumers of Ontario's curtailed solar power generation due to Pickering's continued operation after August 31, 2018; and
- i) The total cost to Ontario's electricity consumers of all power that must be curtailed due to Pickering's continued operation after August 31, 2018.

Please provide a response on a best-efforts basis and make and state assumptions as necessary.

In this interrogatory ED requested information about the quantity and price/cost of surplus base load generation and curtailed wind, water and solar generation due to PEO. OPG declined to provide an answer on grounds of relevance. ED submitted that the requested information is relevant and necessary to establish its market price argument.

ED submitted that "the forecasts of surplus generation and curtailed generation will help determine how much of Pickering's forecast generation will be displacing Ontario gas-fired generation to meet our domestic electricity needs. This will help determine feasibility of water power imports from Quebec and energy efficiency investments as potential alternatives in a cost-benefit analysis of Pickering (because it may not be

necessary to assume that 100% of Pickering's forecast generation would need to be replaced)". ED further submitted that the forecast revenues from Pickering's electricity exports and the forecast cost of curtailed water, wind and solar generation are also needed to properly assess and test a cost-benefit analysis of Pickering.

OPG submitted that it has fully responded to the interrogatory, stating: "The IESO did not evaluate extended operations relative to shutting Pickering down on August 31, 2018 in the October 2015 study. However, the March 2015 study included an assessment of surplus energy and net benefit relative to Pickering shutdown in 2018...." OPG also submitted that it has provided corresponding information that it had developed relative to the 2020 closure base case in its responses to Ex. L-6.5-7 ED-31 and ED-32.

FINDINGS

The OEB is satisfied with the response that has been provided and the additional clarifications provided in related undertakings. The OEB does not believe further information on these topics will be helpful in its examination of issue 6.5.

The OEB notes that while the 2013 Long-Term Energy Plan (LTEP) had contemplated early shutdown, parties in support of the motion have not presented any compelling evidence to suggest that early shutdown is any more likely now than it was when the OEB considered the issue of Pickering Continued Operation in EB-2013-0321 or since the 2013 LTEP. To the contrary, OPG's evidence is that Pickering is well on its way to operate to 247,000 Effective Full Power Hours, implying operation to 2020 is highly likely.

ED Interrogatory No. 35

The interrogatory states:

- a) Please fully describe the IESO's contingency plan to meet Ontario's peak day generation requirements for each year from 2018 to 2024 inclusive if the CNSC does not extend Pickering's operating licence beyond August 31, 2018. Please provide a break-out of its incremental costs, incremental gas-fired generation and incremental greenhouse gas emissions for each year from 2018 to 2024 inclusive;

- b) Please provide an analysis of the costs and benefits of meeting Ontario's peak day generation requirements for each year from 2018 to 2024 inclusive, if the CNSC does not extend Pickering's operating licence beyond August 31, 2018, by: a) curtailing natural gas-fired electricity

exports; b) procuring more demand response resources; c) procuring more energy efficiency resources; d) importing renewable energy from neighbouring jurisdictions; and e) procuring more Made-in-Ontario green energy; and f) by the least-cost combination of options (a) to (e) inclusive.

Please fully describe your analysis and state and justify your assumptions.

In part (a) ED sought a description of the IESO's contingency plan if the Canadian Nuclear Safety Commission (CNSC) does not grant approval to operate Pickering past 2018. In response the IESO stated that the process of risk management planning was ongoing and the specifics will be better defined as the planning progresses. ED submitted that a description of the current iteration of the contingency plan should be provided. ED submitted that the information requested in the interrogatory is relevant to this proceeding and necessary to establish its market price argument.

In part (b) ED sought a comparison of the cost and benefits of operating Pickering beyond August 31, 2018 versus meeting Ontario's peak day generation requirements with a set of cost-effective alternatives. OPG declined to answer the question on grounds of relevance.

ED submitted that it is not asking the OEB to do system planning but that it needs the information to support its market price argument.

In reply, in addition to reiterating its position that contingency planning is ongoing and that the issues raised by ED are not relevant, OPG submitted that early shutdown is not a realistic scenario given that the CNSC has already approved operation to 247,000 EFPH, implying operation to 2020, and that the CNSC decision on OPG's next operating licence is expected by August 31, 2018, making a closure decision effective that day extremely unlikely.

FINDINGS

The OEB is satisfied with OPG's responses that have been provided for parts (a) and (b) and does not believe additional information is necessary. The OEB agrees that the information requested in part (b) is not relevant in determining the matters under consideration in issue 6.5.

ED Interrogatory No. 28 and Undertakings JT1.17 Parts (G), (I), (J)

In ED interrogatory no. 28, ED sought information on the assumptions used in the IESO's cost-benefit analysis. ED's motion deals specifically with the response provided in part (b), where ED requests information on Pickering's available capacity at the time of Ontario peak annual demand. ED sought additional clarification in undertakings JT1.17 parts (G), (I) and (J).

In part (b), ED asks for Pickering's available capacity at the time of Ontario's annual peak demand. ED submitted that OPG has provided information for the period 2015-2019 and requests that OPG be ordered to provide information for the 2020-2024 period as well. ED submitted that although some of the information is outside the period covered by this proceeding, it is needed to properly test the cost-benefit analysis.

OPG submitted that the information was provided.

In JT1.17 parts (G), (I) and (J), ED sought further clarification from the IESO on these matters. In JT 1.17 (G), ED sought information from the IESO on why available capacity in 2020 equaled installed capacity, why an assumption of zero forced outage was used, and details on the methodology. In JT 1.17 (I), ED sought information on installed capacity and available capacity at summer peak, details on the IESO's calculations and on whether the information was consistent with IESO forecasts. In JT1.17 (J), ED sought additional information on the assumptions used in relation to forced outage rates.

In respect of the questions seeking clarification on available and installed capacity and forced outage rates, the IESO has for the most part repeated its position and states:

The Pickering capacity that is available at the time of peak demand is assumed to be the installed capacity, provided that it is not on planned outage or forced outage or in a derated state. The forced outage rate is accounted for within the reserve margin as well as in power system production simulation analysis.

OPG submitted that the answers are fully responsive in explaining the IESO's approach and that if ED objects to that approach it should address the matter in final argument.

FINDINGS

The OEB finds that the responses provided are sufficient for the purposes of the examination of issue 6.5. In the OEB's view the IESO has provided an adequate

explanation of its approach and assumptions concerning installed and available capacity and how forced outage rates have been incorporated in the analysis.

ED Interrogatory No. 29

This interrogatory requests information on current estimates for variables used in the IESO cost-benefit analysis and states:

For each year of the Pickering extension to 2022/2024 analysis, please provide the IESO's *best current estimate* of:

- a) Pickering's total installed capacity (MW);
- b) Pickering's available capacity (MW) at the time of Ontario's peak annual demand;
- c) Pickering's generation (MWh);
- d) The avoided generation (MWh), by fuel type, as a result of Pickering's extended operation;
- e) Pickering's rolling average forced loss rate as defined by OPG's *2015 Nuclear Benchmarking Report*;
- f) The available capacity at the time of Ontario's peak annual demand of new gas-fired
- g) Pickering's fuel and operating cost per kWh;
- h) Pickering's incremental capital expenditures to permit its extension to 2022/24;
- i) Natural gas prices at Henry Hub;
- j) The NYMEX natural gas futures prices at Henry Hub;
- k) Ontario's carbon prices;
- l) Ontario's incremental peaking requirements (MW) to meet the NPCC resource adequacy criterion if Pickering is not extended to 2022/24;
- m) Ontario's cost, per MW, of meeting the NPCC resource adequacy criterion if Pickering is not extended to 2022/24 by: a) domestic supply resources; b) demand response resources; c) energy efficiency resources; and c) electricity imports from neighbouring jurisdictions.

Please fully justify all your responses. In particular, please state your methodology and assumptions for calculating Pickering's available capacity (MW) at the time of Ontario's peak annual demand.

In response to the interrogatory the IESO provided its current estimate for the variables and where none were available so noted. ED's motion sought further information for parts (b), (d), (e), (f), (g), (h), (i), (l) and (m). In most cases the request is for an explanation as to why better current estimates are not available.

OPG submitted that the IESO has fully responded to the questions by providing the information in the original response and additional clarifications in undertaking JT1.17 (H). OPG submitted ED had failed to demonstrate that the answers are non-responsive or in any way incomplete.

FINDINGS

The OEB finds that the IESO has adequately responded to the interrogatory and that a further response is not needed.

ED Interrogatory No. 39

The interrogatory requests information on early shutdown scenarios and considerations in respect of the Quebec power trade agreement.

The September 2016 Mandate Letter to the Minister of Energy asks that he “Continue to partner and collaborate with the Province of Québec on key energy issues, including ... In co-operation with the IESO and Hydro-Québec, further the intention to explore an electricity trade agreement that would provide value to Ontario ratepayers.”

- a) Please compare the net present value of the overall costs and benefits of following three scenarios:
 - i. OPG’s proposal to continue operating Pickering until 2022/2024;
 - ii. Pickering shutdown in August 31, 2018, with replacement power to come from an electricity trade agreement with Quebec (to the extent that it is technically feasible, with any additional power that cannot be imported to be provided by the next least cost alternative); and
 - iii. Pickering shutdown in December 31, 2020, with replacement power to come from an electricity trade agreement with Quebec (to the extent that it is technically feasible, with any additional power that cannot be imported to be provided by the next least-cost alternative).

Please make best efforts to estimate the cost of replacement power from an electricity trade agreement with Quebec. Please include provisos [as] is necessary. Please consider including a number of agreement scenarios or ranges to address uncertainty regarding the terms of such an agreement. Please indicate and state assumptions and calculations.

In this interrogatory ED asked that the IESO’s cost-benefit analysis regarding PEO be recalculated to take into consideration the electricity trade agreement with Quebec plus

the next least-cost sources. ED asked that the analysis be done for August 31, 2018 onwards.

In response to the interrogatory the IESO stated that it had considered the least-cost alternative, identified concerns regarding capacity shortfalls in relation to the Quebec agreement that had not been contemplated by ED and stated that early shutdown was not a realistic scenario. At the technical conference OPG declined to provide additional information because it believes the information that is requested is not relevant and that the question deals with system planning matters and is therefore out of scope. ED submitted that it is not asking the OEB to engage in system planning and that the information is relevant because it needs the information to support its market price argument.

FINDINGS

The OEB will not require OPG to provide additional information as requested in the motion. As indicated above, the OEB is of the view that the request to update the analysis to take into consideration the recent Quebec power trade agreement would primarily involve an examination of system planning.

ED Interrogatory No. 27

In this interrogatory ED sought detailed spreadsheets related to OPG's analysis and considerations related to the Quebec power trade agreement.

Reference: Ex. F2, Tab 2, Schedule 3, Attachment 2, p. 16-18

- a) Please provide the detailed data and electronic spreadsheets underlying OPG's economic assessment of Pickering Continued Operations, including its assessment of the system economic value. The economic assessment appears at pages 12 to 14 of OPG's business case (using the numbering at the bottom right corner).
- b) As part of its assessment of the system economic value of continuing to operate Pickering until 2022/2014, did OPG consider the possibility of a contract for Quebec power as the primary source of replacement power for Pickering?
- c) Please redo OPG's system economic value analysis based on the assumption that replacement power is sourced primarily from an electricity import agreement with Quebec.

In this interrogatory ED sought detailed spreadsheets from OPG in respect of its analysis and information on whether the analysis had considered Quebec power as a replacement for power from Pickering. OPG as part of its original response did not

provide the requested spreadsheets. ED submitted that it needed the spreadsheets to be able to test the evidence and “to recalculate the economic assessment based on a set of assumptions that it believes to be more accurate”.

OPG submitted that it did not provide the spreadsheets because its assessment is not based on a spreadsheet; rather it involves a complex model of Ontario production, imports and exports. OPG also submitted that its model uses OPG proprietary data and cannot be operated without training and the appropriate software licences. However, as part of the reply submissions OPG undertook to provide electronic spreadsheets that would allow ED to modify certain cost related assumptions. Inputs that OPG considers to be system planning functions were hardcoded. The spreadsheet was filed on December 22, 2016.

FINDINGS

The OEB will not require OPG to provide additional information as requested in the motion. The OEB is of the view that the request to re-do the analysis to take into consideration the recent Quebec power trade agreement would primarily involve an examination of system planning. The OEB also notes that OPG has filed the spreadsheet referred to above. In the OEB’s view the spreadsheet is helpful in assessing the sensitivity of certain cost related input assumptions.

Undertaking JT2.05

The undertaking states:

Of the costs included in ED 18, Board Staff 116, and GEC 38 – To advise which were included or excluded from the economic assessment of Pickering, including the calculation of the 6.5 cents per kilowatt hour.

The undertaking required OPG to reconcile Pickering’s total OM&A costs with the costs that were included in the cost/benefit analysis of Pickering and to provide in table format costs that were excluded from the cost-benefit analysis.

ED submitted that OPG did not fully list or justify the costs excluded from the cost-benefit analysis. ED provided the following example: “...for 2021, approximately \$644 million in operating costs were excluded. The items that are listed and discussed in the undertaking response add up only to \$141 million, which leaves the vast majority of the excluded costs unidentified and unexplained.”

ED submitted that the OM&A numbers are central to the cost-benefit analysis and requested that OPG provide a complete response, including a full reconciliation table as requested and an explanation for each cost item that is excluded from the cost-benefit analysis.

OPG submitted that it has adequately responded to the undertaking. OPG submitted that the essence of ED's complaint appears to be that it does not like the way in which the Levelized Unit Energy Cost was calculated. OPG also submitted that it did not provide the information in table form because the detailed response could not be reduced to a table format. OPG also submitted that ED is incorrect in claiming that OPG had failed to justify why certain costs were excluded from the economic assessment.

FINDINGS

The OEB directs OPG to provide the reconciliations between total operating costs and incremental operating costs included in the cost benefit analysis for each of the test years as noted in the motion. The OEB expects that a better understanding of the specific items included in ongoing operating costs will assist in the review of issue 6.5.

THE ONTARIO ENERGY BOARD THEREFORE ORDERS THAT:

1. The motion for further answers in respect of ED 27, 28, 29, 30, 33, 35 and 39, and JT1.17 (G), (I), (J), is denied.
2. OPG shall file with the OEB, and copy all intervenors, the clarifications in relation to JT2.05 as noted in this Decision, on or before **February 24, 2017**.

OPG and the IESO will make an IESO witness available to explain factors relevant to Pickering Extended Operations including the cost-benefit analysis performed.

DATED at Toronto, **February 16, 2017**

ONTARIO ENERGY BOARD

Original signed by

Kirsten Walli
Board Secretary