

10 June 2014

Ontario Energy Board  
2300 Yonge St., 27<sup>th</sup> Floor  
Toronto, ON  
M4P 1E4

Attn: Ms Kirsten Walli  
Board Secretary

By electronic filing and e-mail

Dear Ms Walli:

**Re: EB-2013-0321 - OPG 2013-14 Payment amounts – Notice of request for OPA witness**

We are in receipt of Mr. Lyle's June 9<sup>th</sup> letter to the Board on behalf of OPA responding to our letters of May 30<sup>th</sup> and June 3<sup>rd</sup>. We are concerned that Mr. Lyle's letter neatly avoids responding to the concern that we have raised: that it appears that critical information about falling load was available to the OPA before its letter was drafted but was not included in it, and that the letter was filed in evidence before the Board by OPG without referencing the impact of the new energy demand information. Mr. Lyle's comment that the OPA continues to support the conclusions in its August 15<sup>th</sup>, 2012 letter to OPG, a comment made despite OPA's analyst's observation that the result would now be a \$760 M dis-benefit, only adds to the confusion about the reliability of the figures in the OPA letter.

I attach the original Freedom of Information (F.O.I.) request made by Greenpeace Canada which specifically refers to, and attaches a scan of, the OPA letter that was filed by OPG in this hearing (Ex. F-2-2-3 Att. 2). Greenpeace requests the OPA's 2012 assessment, and goes on to say: "The OPA summarizes its conclusions in the attached letter." There can be no doubt that the material OPA provided last month is the available material underlying the August 15<sup>th</sup>, 2012 letter. We will upload to the RESS a copy of the OPA's 964 page F.O.I. response and the index thereto.

The report dated April 16, 2012 that OPA provided to Greenpeace in its F.O.I. response provides "The net system benefit ranges from -\$0.76 billion to \$1.33 billion for the range of system conditions evaluated." This is virtually identical to the range of -\$0.76B to +\$1.3B identified in the August 15<sup>th</sup> letter (Ex. F-2-2-3 att. 2). The memo from Bashir Bhana included at page 137 of the F.O.I. response, and attached to Mr. Stensil's affidavit as attachment 5 (and attached hereto for ease of reference) then cites an updated energy demand forecast, lowering demand by 3 TWH/year, that would bring the OPA estimate down to "a net benefit similar to that in the low demand sensitivity case (net cost of \$760M)." The memo is dated

April 24, 2012, eight days after the “draft report” and predating the OPA’s August 15, 2012 letter to OPG that was filed before the Board. The F.O.I. materials do not appear to contain any subsequent analysis that incorporates this new information and any potential offsetting changes. Indeed, it would be a surprising coincidence if any such offsetting changes exactly equalled the change due to the falling forecast. Further, OPG confirms in Ex. L-6.6-8-GEC-007 that the load forecast underlying the 2013 LTEP has fallen further, and significantly, from that utilized by OPA for its assessment. In L-6.6 -8-GEC 007 OPG provides values it indicates were used by OPG, averaging 151.77 TWh 2014-2020 (net of conservation), whereas the Bashir Bhana memo recites that “The average updated energy demand forecast between 2013-2020 is 136 TWh/year”. Accordingly, there can be little doubt that falling demand was understood by OPA to have lowered the calculated net benefit (to a net dis-benefit) before it penned its letter to OPG. Further, it is unlikely that OPG would have been unaware of this effect by the time it filed the letter in October 2013 when demand had fallen further still. OPG is certainly aware of that now and has not sought to update the filing accordingly.

Accordingly, we reiterate what Mr. Lyle and Mr. Smith both refer to as our “serious” observation “that OPA and (perhaps inadvertently) OPG may not have provided the Board with the full story needed to inform these issues...”. We don’t disagree – this is indeed a serious concern.

As the Board has ruled in its June 4<sup>th</sup> Decision, “generation planning is not within the scope of this proceeding. However, the costs sought for Pickering continued operations throughout the test period are within the scope and to the extent that the recently obtained information can be helpful in assessing the reasonableness of those costs, the Board is interested in oral examination of this issue.” Thus clarifying this matter is both important to the substantive issues before the Board and to ensuring the integrity of the Board’s process. Accordingly, we will request that OPA make its analyst Bashir Bhana available to be cross-examined before the Board, failing which we expect the need to request the issuance of a subpoena. I will be in attendance on the 12<sup>th</sup> to address this and other procedural matters.

Sincerely,

A handwritten signature in black ink, appearing to read "David Poch", with a stylized flourish at the end.

David Poch  
Cc: all parties



October 16, 2013

Crystal Pritchard  
Freedom of Information Coordinator  
Ontario Power Authority  
Suite 1600  
120 Adelaide Street West  
Toronto, ON M5H 1T1

Dear Ms. Pritchard,

**RE: Freedom of information for analysis on the Pickering continued operations**

This letter is to request the OPA's 2012 assessment of the continued operation of the Pickering nuclear station. The OPA summarizes its conclusions in the attached letter. I am particularly interested in the demand forecasts and capacity requirements used in this analysis.

You will find attached to the required payment to the Ontario Power Authority.

Truly,

Shawn-Patrick Stensil  
Nuclear Analyst  
Greenpeace Canada  
33 Cecil St.  
Toronto, Ontario  
M5T 1N1



120 Adelaide Street West  
Suite 1600  
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August 15, 2012

Mr. Pankaj Sardana  
Vice President, Regulatory Affairs  
Ontario Power Generation  
701 University Avenue  
Toronto, Ontario M5G 1X6

Dear Pankaj,

Re: Pickering NGS Continued Operation and Darlington NGS Refurbishment

The Ontario Power Authority supports Ontario Power Generation's proposals for expenditures in 2013 and 2014 to maintain the options of continued operation at Pickering NGS and refurbishment of Darlington NGS.

The Ontario Power Authority ("OPA") has evaluated the merit of these options and will continue to evaluate them as circumstances evolve.

Pickering NGS Continued Operation

In the absence of continued operation, the six generating units (3,094 MW) that are currently in operation at Pickering NGS are expected to cease operation beginning around 2015. The feasibility of continued operation is expected to be confirmed by the end of 2014. If feasible, it would provide the option to continue to operate the units at Pickering NGS through to approximately 2020.

From 2013 to 2014, it will be necessary for OPG to incur up to \$85 million at Pickering NGS to preserve the option of continued operation through additional inspection and maintenance work. It will be necessary for OPG to increase the number of generating unit planned outage hours at Pickering NGS during the 2013 to 2014 period to perform this work.

OPG has provided the OPA with updated information regarding their proposal for the continued operation of Pickering NGS (Appendix 1). The OPA has evaluated the effects of Pickering NGS continued operation on various aspects of the integrated power system, including capacity and energy requirements, system costs, Ontario CO<sub>2</sub> emissions, and transmission implications.

The OPA's analysis to date identifies a number of potential merits to preserving the option of continued operation at Pickering NGS. These include:

- Reduced need for replacement capacity and energy during part of the nuclear refurbishment period. Without continued operation and if all currently directed resources proceed as planned, between nearly 1,000 MW and 3,000 MW of capacity replacement would be required between 2016 and 2020.

- An approximately 11 megatonne reduction in Ontario CO<sub>2</sub> emissions between 2015 and 2020.
- Potential for deferral of some investments in transmission enhancements needed to maintain reliable load supply to customers in the east GTA upon retirement of Pickering NGS. This is further described in OPA's evidence to Hydro One regarding the need and rationale for "Oshawa Area" TS (EB-2012-0031, Exhibit D1-3-3 Appendix B).
- A hedge against mid-term uncertainties that could result in additional replacement requirements.

The OPA's assessment illustrates that cost implications of Pickering continued operation could vary across a wide range of potential circumstances. Key factors in this context include electricity demand, price of natural gas; price of carbon; length of the continued operation period; magnitude of capital and fixed operating costs and quantity of production from Pickering NGS during the continued operation period.

On balance, the OPA's assessment of system cost impacts suggests an expected cost advantage to Pickering continued operation (in the order of approximately \$100 Million). This advantage predominantly reflects expected costs savings from reduced natural gas-fired energy production and lower replacement capacity requirements. Based on evaluation to date of the broader uncertainties, the OPA estimates a range of up to approximately \$1.3 billion in potential net-benefit from Pickering continued operation to \$0.76 billion in potential net-cost (dis-benefit). These estimates represent illustrative bookends and explore combinations of factors that together would increase or decrease the cost impacts of Pickering continued operation. Some of the factors outlined are out of OPG's control, while others, such as station operational performance and cost, are within OPG's control. Opportunities for enhancing value through further coordination of other nuclear plans with plans for continued operations at Pickering have not yet been considered in the OPA's assessment. The OPA expects to explore such opportunities over the coming year.

An additional consideration that was not quantitatively reflected in its cost assessment of Pickering continued operation, but which informs the OPA's perspective on the option is the hedge that Pickering continued operation could provide against mid-term uncertainties. Continued operations at Pickering would see approximately 3,000 MW of nuclear supply remain available during a period of significant transition in the Ontario power system. This mid-term period, roughly spanning the years 2015 to 2021, immediately follows the shutdown of coal-fired generation in Ontario and features the following:

- Multiple concurrent refurbishment outages and restarts among Ontario's nuclear stations (the plans for which remain in development in some instances)
- Potential unit retirements at several currently existing natural gas-fired generators
- Sizeable expected contributions from conservation programs over and above already significant levels of anticipated natural efficiency gains in the Ontario economy
- Expected implementation of a substantial number of supply resources that are presently contractually committed or directed, and
- Uncertainty related to the pace of economic recovery in the province.

In short, the mid-term period involves significant transition and many moving pieces, some of which remain to be resolved and each of which present some degree of risk. Continued operation at Pickering is seen by the OPA as a timely and potentially helpful source of insurance within this dynamic context.

#### Darlington NGS Refurbishment

The four-units at Darlington NGS (3,512 MW) entered service between 1990 and 1993. The Darlington design includes the need for major refurbishment at mid-life. Without refurbishment, Darlington NGS would cease production in 2020. With refurbishment, Darlington NGS would continue production until 2054 (Appendix 2).

OPG has been active on Darlington NGS refurbishment planning and development work since 2007. Total investment in capital and OM&A is expected to total approximately \$370 M by the end of 2012. To date, there has been significant refinement in scope and OPG has expressed high confidence in project costs and project execution. The Darlington Refurbishment Project is now in the Definition Phase and OPG has proceeded with contracting and procurement of labour and materials.

The OPA's support for expenditures in 2013-2014 to preserve the option of Darlington refurbishment is based on strategic considerations supported by cost comparisons. Strategic considerations prevail given the long time-period under consideration (to 2054) and correspondingly high degree of uncertainty. The cost comparisons developed by the OPA are to be taken in the context of uncertainty, including with respect to the long-term supply and price of natural gas, value of carbon and cost of new nuclear—all three come with a wide range of uncertainty.

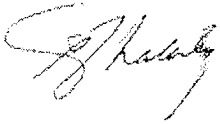
On balance, the preservation of approximately 3,500 MW and 28 TWh of nuclear supply on an existing site with access to services and transmission is seen to have merit in terms of shorter lead-time, community acceptance, impacts on the environment and cost. In consideration of the longer-term uncertainties, the OPA's probabilistic analysis suggests a high likelihood that refurbishing Darlington NGS would be less costly than other sources of supply, including new nuclear or new gas-fired facilities, for a wide range of potential future conditions.

In addition to the above considerations, the OPA estimates that the option would not add significantly to carbon emissions in the province. In comparison, an equivalent natural gas-fired alternative would increase CO<sub>2</sub> emissions by an average of 10 megatonnes annually between 2024 and 2054. This would approximately triple the annual volume of CO<sub>2</sub> emissions for Ontario that is otherwise projected for the long-term.

Further, the OPA views Darlington refurbishment as supportive of the diversity and performance of Ontario's long-term electricity supply mix. The rationale for a diverse supply mix relates to considerations of uncertainty, risk mitigation and security of supply. Recognition of nuclear energy in these and other regards is found in the OPA's Supply Mix Advice provided to the Ontario Government in December 2005, the Integrated Power System Plan submitted to the Ontario Energy Board in 2007 (EB2007-0707), the Ontario Government's Long-Term Energy Plan issued in 2010 and, subsequently, in the 2011 Supply Mix Directive. Each of these identifies an important role for nuclear energy in Ontario's long-term supply mix. Refurbishment of Darlington, in addition to the merits outlined above, is consistent with this direction.

In closing, the OPA supports OPG's proposals for expenditures in 2013 and 2014 to maintain the options of continued operation at Pickering NGS and refurbishment of Darlington NGS. The OPA has evaluated the options and will continue to evaluate them as circumstances evolve. Please feel free to contact us should you require additional information.

Regards,

A handwritten signature in black ink, appearing to read 'A. Shaiaby', with a stylized flourish at the end.

Amir Shaiaby  
Vice-President, Power System Planning  
Ontario Power Authority

CC  
Ethan Kohn  
Joel Sheinfeld  
Colin Andersen  
Michael Lyle  
Andrew Pietrewiz

**Appendix 1 - Information Received from OPG Regarding Pickering NGS Continued Operation**

| Incremental Generation in 2013 to 2020 Due to Continued Operation (TWh) |      |      |      |      |      |      |      |      |
|---|------|------|------|------|------|------|------|------|
| Year  | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
| Pickering A (TWh)   | 0.0  | 0.0  | 0.0  | 5.2  | 7.3  | 7.3  | 7.3  | 8.2  |
| Pickering B (TWh)   | 1.3  | 4.7  | 4.6  | 11.4 | 15.3 | 14.7 | 13.0 | 9.1  |
| Total   | 1.3  | 4.7  | 4.6  | 16.6 | 22.6 | 21.9 | 20.3 | 17.2 |

| Incremental Costs in 2013 to 2020 Due to Continued Operation (2012 \$ M) (1) |      |       |       |       |         |         |       |       |
|--|------|-------|-------|-------|---------|---------|-------|-------|
| Year   | 2013 | 2014  | 2015  | 2016  | 2017    | 2018    | 2019  | 2020  |
| Capital and OM&A For Plant Operation   | \$18 | \$52  | \$282 | \$764 | \$878   | \$889   | \$821 | \$575 |
| Costs to Enable Continued Operation in 2013-2014                             | \$38 | \$47  | \$0   | \$0   | \$0     | \$0     | \$0   | \$0   |
| Fuel & Fuel Related Costs  | \$8  | \$28  | \$27  | \$94  | \$135   | \$114   | \$110 | \$93  |
| Total Continued Operation Cost   | \$64 | \$126 | \$310 | \$858 | \$1,013 | \$1,003 | \$931 | \$668 |

(1) Total OM&A & Capital includes station OM&A (base, outage, projects) and sustaining capital projects and the station's share of incremental allocated nuclear and corporate support costs. These costs do not include the severance costs associated with each scenario.

| Incremental Planned Outage Days in 2013 to 2020 Due to Continued Operation |      |      |      |      |      |      |      |      |
|--|------|------|------|------|------|------|------|------|
| Year   | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
| Pickering A Incremental Planned Outage Days                                | 0    | 0    | 0    | 78   | 87   | 85   | 76   | 0    |
| Pickering B Incremental Planned Outage Days                                | -114 | -157 | 337  | 297  | 146  | 196  | 73   | 0    |



Appendix 2 - Information Received from OPG Regarding Darlington NGS Refurbishment

| Darlington NGS Refurbishment Schedule |                             |                    |                          |                        |                                  |                           |
|---------------------------------------|-----------------------------|--------------------|--------------------------|------------------------|----------------------------------|---------------------------|
| Unit                                  | Unit Shutdown Date          | Idle Time (months) | Refurbishment Start Date | Refurbishment End Date | Shutdown Date Post-Refurbishment | Refurb. Duration (months) |
| 1                                     | Same as Refurbishment Start | 0                  | Oct - 2016               | Dec- 2019              | Dec - 2049                       | 39                        |
| 2                                     | Same as Refurbishment Start | 0                  | May - 2018               | May- 2021              | May - 2051                       | 37                        |
| 3                                     | Same as Refurbishment Start | 0                  | Dec - 2019               | Oct- 2022              | Oct - 2052                       | 35                        |
| 4                                     | Jul - 2020                  | 10                 | May - 2021               | Jan- 2024              | Jan - 2054                       | 33                        |

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**From:** Bashir Bhana  
**Sent:** April-24-12 4:51 PM  
**To:** Andrew Pietrewicz  
**Cc:** Bob Gibbons  
**Subject:** Updated Demand/Pickering

Andrew – here is a quick comparison of the new demand forecast relative to the LTEP forecasts (used in the Pickering study).

The updated peak demand forecast is about the same as in the LTEP low growth forecast up to 2018 (~23,000 MW). Between 2019-2020, the updated peak demand forecast falls between the LTEP low and LTEP medium forecasts (23,400 MW).

The updated energy demand forecast is lower than the LTEP low growth forecast by an average 3 TWh per year beginning in 2015. The average updated energy demand forecast between 2013-2020 is 136 TWh/year. In comparison, the LTEP low and medium forecasts average 138 TWh/year and 146 TWh/year, respectively between 2013-2020.

Regarding the Pickering study, I would expect the new demand forecast to produce a net benefit similar to that in the low demand sensitivity case (net cost of \$760M).

Section 18