

Ontario Energy Board

IN THE MATTER OF the *Ontario Energy Board Act, 1998*,
S.O. 1998, c. 15, Sch. B, as amended;

AND IN THE MATTER OF the Application by Ontario
Power Generation Inc. For 2017-2021 Payment Amounts (the
“Application”), EB-2016-0152.

Interrogatories of Energy Probe Research Foundation

October 3, 2016

1.2 Are OPG’s economic and business planning assumptions that impact the nuclear facilities appropriate?

Interrogatory #1

Reference: Exhibit A1, Tab 3, Schedule 3, page 11

Has OPG submitted or received any documents from the Ministry of Energy in regards to the upcoming Long-term Energy Plan? If so, please provide them.

1.3 Is the overall increase in nuclear payment amounts including rate riders reasonable given the overall bill impact on customers?

Interrogatory #2

Reference: Exhibit A1, Tab 3, Schedule 2, page 33

OPG states that it is “not proposing a nuclear industry productivity adjustment,” as the “nature and scale of the capital work planned for the IR period mean that productivity trends would not be a reasonable indicator of predicted productivity for OPG during the IPR period.”

Can OPG explain why a productivity factor couldn’t be used for other work unrelated to the Darlington Refurbishment Project?

Interrogatory #3

Reference: Exhibit A1, Tab 3, Schedule 3

Please list any costs to OPG or its shareholder if it were to end the DRP after the refurbishment of the Unit 2.

2.1 Are the amounts proposed for nuclear rate base (excluding those for the Darlington Refurbishment Program) appropriate?

Interrogatory #4

Reference: Exhibit D2, Tab 1, Schedule 3, page 1

Can OPG complete the following table for tier 1 projects listed in the BSCs:

Project	Original forecast cost (before scope changes)	Actual cost	Original forecasted completion date (before scope changes)	Actual completion date

3.2 Are OPG's proposed costs for the long-term and short-term debt components of its capital structure appropriate?

Interrogatory #5

Reference: Exhibit A1, Tab 3, Schedule 3, page 5

Has OPG done any analysis that compares its long-term borrowing costs to those of private sector generators? If so, can it please provide those documents.

Interrogatory #6

Reference: Exhibit A1, Tab 3, Schedule 3, page 5

Has OPG done an analysis that compares its credit rating and borrowing costs to private generators? If so, can you please provide those documents.

Interrogatory #7

Reference: Exhibit A1, Tab 3, Schedule 3, Chart 3

1. Has OPG received or provided any comments from ratings agencies regarding its rate smoothing proposal? If so, please provide those documents.
2. Does OPG have any information to suggest that rate smoothing will negatively impact its credit rating?

Interrogatory #8

1. Is OPG issuing any long-term debt that is specifically related to capital spending on the DRP?
2. Can OPG provide a table – or point to it in the evidence – of the amount of long-term debt that the company and expects to issue annually from 2015-2021

4.3 Are the proposed nuclear capital expenditures and/or financial commitments for the Darlington Refurbishment Program reasonable?

Interrogatory #9

Reference: Exhibit D2

Does OPG have any evidence of other nuclear refurbishments that have constructed a mock-up reactor?

Interrogatory #10

Can OPG provide a detailed breakdown of the projected and (now) finalized costs of all spending leading up to the shutdown of Unit 2.

Interrogatory #11

Reference: Exhibit D2, Tab 2, Schedule 5, page 1

Can OPG provide a detailed breakdown of the “change control process to control scope growth.”

Interrogatory #12

Reference: Exhibit D2, Tab 2, Schedule 7, page 5

1. Does OPG have a list of other major infrastructure projects that have used the Palisade software to establish their contingency?
2. Is OPG aware of any cost overruns at projects that have used the Palisade software to establish their contingency?

Interrogatory #13

Reference: Exhibit D2, Tab 2, Schedule 7, page 6

Can OPG provide a list of the “low probability, high consequence events” that the company didn’t consider in establishing its contingency amount.

Interrogatory #14

Reference: Exhibit D2-2-8, Attachment 1, page 16

Does the Levelized Unit Energy Cost (LUEC) include the cost of interest that will be owed due to rate smoothing and deferral? If not, Can OPG calculate what they will add to the LEUC estimate?

Interrogatory #15

Reference: Exhibit D2-2-8, Attachment 4, page 15

OPG states that it had reached an agreement with the Joint Venture (JV) that has eliminated and “Productivity Gains.”

Can OPG please explain what is meant by that comment. Does that mean the JV is not required to show productivity gains over the course of the DRP?

Interrogatory #16

Reference: Exhibit D2-2-8, Attachment 4, page 21

The report states that the JV “has not yet been subjected to the full scope of acceptance testing and reliability cycling. It has also been identified that “Plan B” methods of temporarily managing the retube waste to avoid delays in reactor face work were investigated...however at this point no feasible options have been identified. The impact is there is currently no “buffer” for the waster should significant issues with the retube waste processing system be encountered. It is for these reasons the Panel believe retube waste processing remains a significant risk to the project, at least for the first unit.”

Can OPG provide any evidence that it has addressed the Panel’s concerns?

Interrogatory #17

Reference: Exhibit D2-2-8, Attachment 4, page 22

Can you confirm that the Panel knew very little about the details and rigor applied to the planning of critical path activities in the segments of the outage when OPG activities are on the critical path?

Can you also confirm that these activities account for 20% of the time that Unit 2 is being refurbished?

Interrogatory #18

Reference: Exhibit D2, Tab 2, Schedule 9, page 9

Has OPG issued any status reports to date? If so, please provide them or a link to those reports.

Interrogatory #19

Reference: Exhibit D2, Tab 2, Schedule 9, page 11

1. Can you please provide any internal audit group reports?
2. Can you please provide any Refurbishment Construction Review Board reports?
3. Can you please provide any Darlington Refurbishment Committee of OPG’s Board of Directors reports?

Interrogatory #20

Reference: Exhibit D2, Tab 2, Schedule 10, page 17

Can you provide a final cost estimate for the Heavy Water Facility project.

5.1 Is the proposed nuclear production forecast appropriate?

Interrogatory #21

Reference: Exhibit E2, Tab 1, Schedule 2, table 1

OPG has consistently missed its approved nuclear production forecasts.

1. Can you provide how much money OPG has collected through its variance account as a result of missing approved production forecasts from 2013-2015?
2. Does OPG have an updated nuclear production forecast for 2016?

Interrogatory #22

Can OPG list the amount of power (in TWh) it has curtailed from its nuclear reactors in 2013, 2014, 2015 and to date in 2016. Can it do so quarterly.

Interrogatory #23

Can OPG list the amount of SBG by quarter in 2013, 2014, 2015 and to date in 2016.

Interrogatory #24

Can OPG indicate for each of 2012, 2013, 2014, 2015 and 2016 (to date) how often (in hours/years or %) OPG received a higher rate for its nuclear generation than IESO's market price.

6. OPERATING COSTS

6.5 Are the test period expenditures related to extended operations for Pickering appropriate?

Interrogatory #25

Reference: Exhibit F2, Tab 2, Schedule 3, Chart 2

Does OPG have an updated forecast for the cost to keep Pickering running past 2020?

6.7 Are the corporate costs allocated to the nuclear businesses appropriate?

Interrogatory #26

Ref: Application, Ex F3-T1-Sch 1-Table 1, Table 3

The corporate costs shown in these tables are either directly assigned or allocated to the regulated businesses. The latter amounts are based on drivers. (Ex F3-T1-Sch 1 at page 1).

1. The corporate support and administrative costs in Table 1 (\$562.8 in 2013) appear to be the total of all allocated costs of OPG's various businesses. Since the title of Table 1 refers to "groups", please indicate which OPG businesses or entities other than its nuclear business have the costs shown in Table 1 allocated to them.
2. For each amount shown in Table 3, please state the dollar portion thereof that is directly assigned and the portion thereof that is allocated based on drivers.
3. Please confirm or disconfirm the following:
 - a. that the share of OPG's Corporate Support & Administrative Costs that are allocated to the nuclear business is 76.1% in 2013 and 78.7% in 2021 (Plan)
 - b. that for the years 2013-2015, that average annual share of those costs was \$421 million and for the years 2016-2021, the average annual share is \$445 million
 - c. that shares of OPG Corporate Support & Administrative Costs allocated to the nuclear business are:

	2013 Actual	2021 Plan
Business & Admin	83.42%	84.98%
Finance	72.46%	71.51%
People & Culture	79.58%	84.24%
Commercial Ops	39.30%	48.66%
Corporate Centre	57.48%	67.55%

6.8 Are the centrally held costs allocated to the nuclear business appropriate?

Interrogatory #27

Ref: Application, Ex F4-Tab 4-Sch 1-Table 1, Table 3

Total centrally held costs (Table 1) and centrally held costs allocated to nuclear (Table 3) decline over the period 2013 to 2012. The declines are particularly pronounced in 2017 and subsequent years.

1. Do the centrally held costs shown in Table 1 include hydroelectric/Ottawa St. Lawrence shared engineering and operating costs? If not, what other Common Costs (as that term is

defined in the report of the HSG Group Inc. report to OPG dated August 13, 2013) are excluded from Table 1?

2. For each of the amounts shown in Table 3, please provide the amounts thereof (i) that are directly assigned to the nuclear business and (ii) that are allocated to the nuclear business on the basis of drivers.
3. Please confirm that, omitting the line items “Pension/OPEB Related Accrual Costs” and the “Pension/OPEB Adjustment”, the share of total centrally held costs allocated to the nuclear business rises from 74.77% in 2013 to 80.82% in 2021.

10.4 Is the proposed reporting for the Darlington Refurbishment Program appropriate?

Interrogatory #28

Reference: Exhibit A1, Tab 3, Schedule 3

Will the mid-term production review also include a review of the costs and schedule of the Unit 2 refurbishment? If not, how will the Board or ratepayers in general know if the project will be completed on time and on schedule?

11.1 Is OPG’s approach to incentive rate-setting for establishing the regulated hydroelectric payment amounts appropriate?

Interrogatory #29

Reference: Application Ex A1-Tab 3-Sch 2

The Application states at p.5 that following public consultations, OPG modified “the hydroelectric x-factor, increasing the annual productivity adjustment from -1% (as identified by the independent Total Factor Productivity study) to 0% reflecting OEB policy in the electric distribution sector”. At p.9, the Application states that the Board had declined to accept a negative productivity factor in the context of electricity distribution. At p.11, the Application states “in deference to Board policy, OPG has increased the proposed productivity factor to zero.”

In its Report of the Board in EB-2010-0379 issued as corrected on December 4, 2013, the Board determined “that the appropriate value for the productivity factor (Industry TFP) for Price Cap IR is zero”. The Board concluded that zero was a reasonable balance between the measured negative productivity growth over the last ten years and a value that is reasonable to project into the future as an on-going industry benchmark which all distributors should be expected to achieve. (Report of the Board at p.18)

1. Since the Report of the Board in EB-2010-0379 was released in December 2013, what discussion(s) or development(s) at the public consultations referred to above led OPG to modify its proposed hydroelectric x-factor from -1% to 0%?
2. In OPG's view, are the industry conditions in distribution and in hydroelectric generation so similar that a value that is reasonable to project into the future for distributors ought to be applied to OPG's hydroelectric generation business?
3. If the answer to the above question is yes, please identify those conditions that are so similar as to suggest the adoption of the same productivity growth rate in both.
4. If the answer to question 2 above is no, what value would be reasonable in OPG's view to project into the future for as an on-going benchmark which all hydroelectric generators should be expected to achieve?

Interrogatory #30

Ref: Application Ex A1-Tab 3-Sch 2 and Attachment 1

“Empirical Analysis of Total Factor Productivity Trends in the North American Hydroelectric Generation Industry, prepared for OPG Inc. by London Economics International LLC, December 19, 2014

“Total Factor Productivity Study for OPG's Regulated Hydroelectric Business”, Presentation by London Economics International LLC, prepared for stakeholder consultations, December 17, 2014 (“LEI Presentation”)

Attachment 1 is the report dated February 19, 2016 that London Economics International LLC prepared for OPG (the “Update Report”); it updates the LEI report to OPG on total factor productivity dated December 19, 2014 (the “Initial Report”).

At p.48 of its Update Report, LEI estimates that the industry TFP growth over the period 2002-2014 is “in the range of -1% per annum”. LEI further states that “negative TFP results can be expected for a TFP study on a mature hydroelectric industry”.

The LEI Presentation states (at slide 13):

- >Negative TFP trend should be “expected” for a mature hydroelectric business because of the fixed production capability, fixed capital stock and rising costs of maintenance through the life cycle of a hydroelectric resource
 1. Output levels should be *on average* stable over time (given generator design)
 2. Capital inputs are constant (once a hydroelectric plant is put into service)
 3. OM&A would likely be increasing over time in order to maintain the assets' operational capability

Citing notes from the stakeholder consultation, the Application elaborates as follows:

LEI explained that a negative productivity factor for the hydroelectric generation industry is expected, given it is an industry with substantial fixed productive capability, fixed

capital stock, and increasing operating and maintenance costs that would naturally lead to negative productivity growth. (Ex A1-Tab 3-Sch 2 at p.19)

1. In OPG's view, is it realistic to consider OPG's hydroelectric production capability and capital stock as fixed or substantially fixed? Please take in consideration such developments as the Niagara Tunnel Project.
2. Does OPG contend that LEI's reported negative productivity growth rate is the result of OPG's inability to recover its "rising costs of maintenance" in rates, with the result that it been unable to generate sufficient profits to reinvest into plant and equipment while maintaining adequate dividends to its shareholder? Stated differently, does OPG attribute LEI's negative productivity growth rate to inadequacies in the cost-of-service regulatory regime?
3. For how long, according to LEI, has (i) the North American hydroelectric generation industry and (ii) OPG's hydroelectric business been "mature"? Were one or both of them mature in the years before the study period used in the LEI study?
4. If either of both of the industry and OPG's hydroelectric business have been mature for a period significantly longer than its study period, would LEI expect to see negative productivity growth throughout that period for the industry or OPG?
5. If the answer to question 2 above is no, please explain what other factors may have caused LEI's total productivity growth factor to be negative for the period of LEI's study but not prior to that period.
6. Did LEI review any of the various studies published by the independent statistical agency Statistics Canada on long-term multifactor productivity growth trends in Canada at the aggregate or industry level?

Interrogatory #31

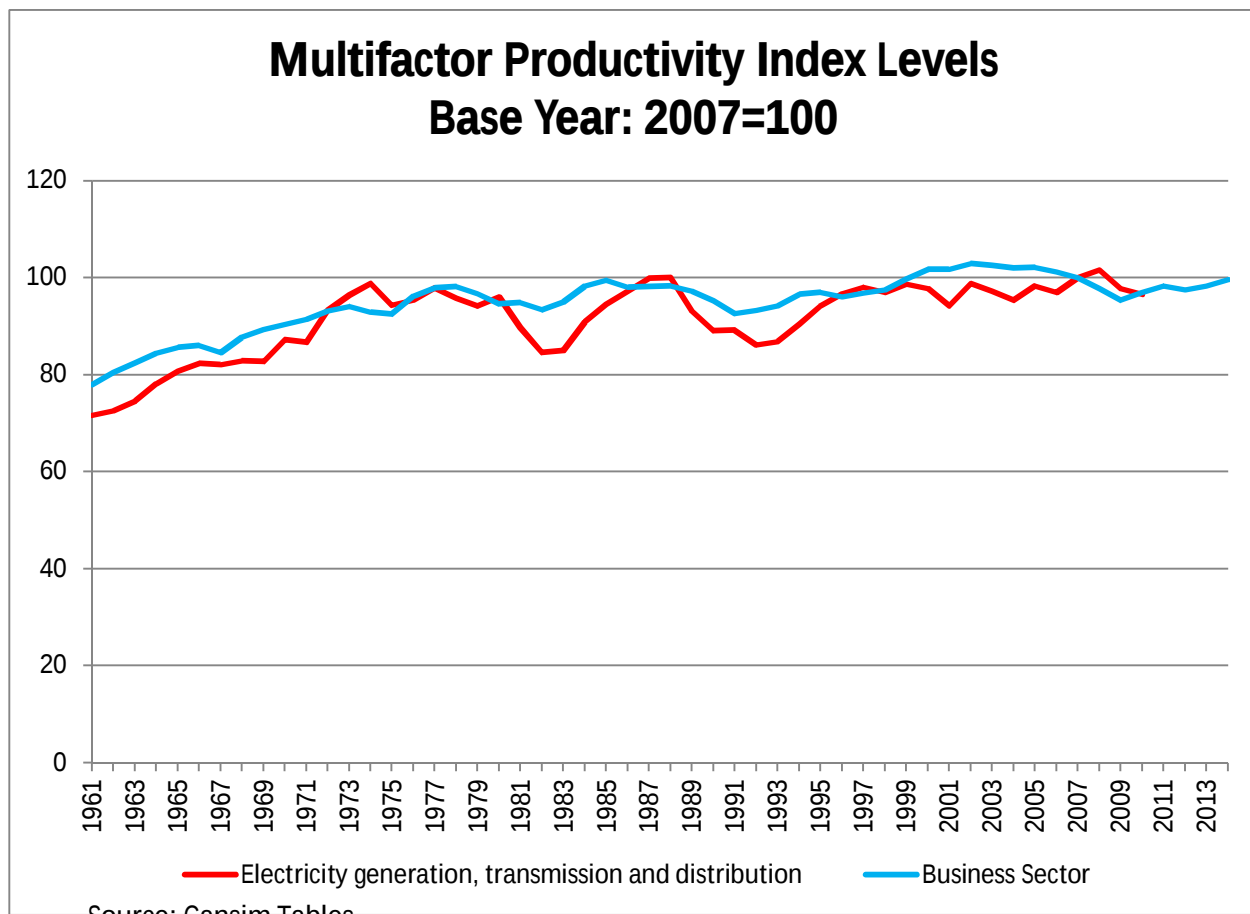
Ref: Application Ex A1-Tab 3-Sch 2 and Attachment 1

CANSIM Table 383-0021: Multifactor productivity...in the Canadian business sector

CANSIM Table 383-0032: Multifactor productivity...in Electric power generation, transmission and distribution

Statistics Canada maintains and updates the Canadian Productivity Accounts, and has multi-factor and other productivity data for years going back to 1961. Data in CANSIM Table 383-0021 indicate that levels of multi-factor productivity in the Canadian business sector fell in eight of the eleven years 2000-2010 inclusive. In the industry category "Electric power generation,

transmission and distribution”, data in CANSIM Table 383-0032 productivity levels fell in seven of those years. The following chart is based on the CANSIM tables referenced above.



The LEI Updated Report used a study period of 2002-2014. According to Figure 27 of the Updated Report, total-factor productivity growth was negative in five of those years.

The CANSIM data tend to support LEI’s conclusion of declining productivity growth in the study period used in its Updated Report. In the overlapping eight years, the CANSIM series has 5 negative growth years and the mean annual growth rate is -0.25%; the Updated Report (Figure 27) has 3 negative growth years and the mean annual growth rate is -0.54%.

In the Report of the Board in EB-2010-0379, the Board refers to the “long-run productivity of the sector” (at p.15).

1. Please confirm that the study period used in the Updated Report was selected, in part, because LEI could not obtain comparable data for earlier years.
2. Does OPG regard LEI’s study period as providing evidence on the “long-term productivity growth rate” to which the Board has referred?

3. Do the charted CANSIM data suggest that the long-term productivity growth rate for hydroelectric generation would be more accurately measured by examining a much longer time period if the relevant data were available?
4. Do the charted CANSIM data tend to support the conclusion that the long-term productivity growth rate for hydroelectric generation would be negative or zero if the relevant data were available?
5. Might the fact that levels of multi-factor productivity in the Canadian business sector fell in eight of the years 2000-2010 plausibly suggest that the negative growth rate for hydro reported by LEI had much more to do with factors and events external to OPG rather than those factors suggested by LEI?
6. Please confirm that for the 49 years from 1961-2010 inclusive, the mean productivity growth rate for the industry category “Electric power generation, transmission and distribution” was 0.668% per year with a standard deviation of 3.347%. Energy Probe will provide the charted data from CANSIM Table 383-0032 on annual productivity levels.

11.6 Is OPG’s proposal for smoothing nuclear payment amounts consistent with O. Reg. 53/05 and appropriate?

Interrogatory #32

Reference: Exhibit A1, Tab 3, Schedule 3, page 5

OPG states that its proposal for a constant 11% annual increases for the nuclear revenue requirement are based on interpreting provincial legislation as “stability implies a constant rate change each year...”

1. Can OPG why it’s taken such a narrow view of the legislation? Would it be opposed to, for example, a steady increase annually (11% in year one, 12% in year 2 and so on), which would limit that amount of money that would have to be deferred?
2. Can OPG calculate the amount of money that would be deferred if it increased its nuclear revenue requirement by 11% in year one, 12% in year two, 13% in year 3, 14% in year 4 and 15% in year 5?

Interrogatory #33

Reference: Exhibit I1, Tab 1, Schedule 2, table 1

Would a decline in provincial demand over the time period of the rate application have a material impact on the bill changes as they are currently presented?

Interrogatory #34

Reference: Exhibit I1, Tab 1, Schedule 2, table 1

Can you calculate that table, but use the unsmoothed nuclear revenue requirement.

11.7 Is OPG's proposed off-ramp appropriate?

Interrogatory #35

Has OPG prepared any plan for off-ramping the DRP? At what cost or delay in refurbishing Unit 2 would the company considering scrapping the refurbishment of later units?

If the company has any documents related to this question, please provide them.