UNDERTAKING J10.3

Undertaking

To provide the math behind the average growth in OPG labour costs per FTE presented on page 22 of SEC's compendium (K10.4). Were amounts disallowed for compensation costs in EB-2013-0321 excluded from this calculation?

Response

The following response was provided by LEI.

Please see the attached Excel file provided by LEI which demonstrates how LEI calculated the average growth in OPG labour costs per FTE from 2002 to 2012, which was presented in the stakeholder information session in 2014.[1] This average growth in OPG labour costs per FTE was calculated using annual data on labour costs and annual data on FTEs for OPG's hydroelectric fleet only, as provided by OPG, and consistent with the O&MA data relied upon in LEI's TFP study.

LEI's calculation (as reproduced at page 22 of SEC's compendium) covered the period from 2002 to 2012. The compensation disallowances made in EB-2013-0321 for 2014 and 2015 were subsequent to that period and did not apply (see the response to Undertaking J10.4 regarding the impact of that disallowance). The OEB has not disallowed hydroelectric compensation amounts in prior applications.

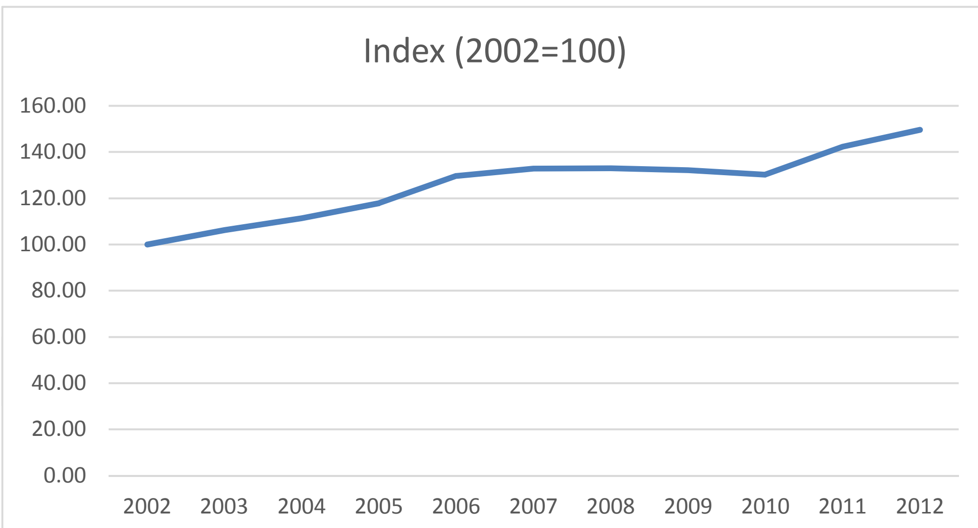
- Attachment 1: Undertaking J10.3 – Calculation of OPG labour cost per FTE

[1] LEI. *Inflation Factor Analysis for OPG Regulated Hydroelectric IRM*. December 17, 2014. P 9. <http://www.opg.com/about/regulatory-affairs/stakeholder-information/Documents/Payment_Amounts/Inflation_Factor_Analysis.pdf>

Year	I # FTEs	I K$ Labour_OM&A	Labour cost per FTE	Index (2002=100)	Growth Rate
2002	878	78,723	89.66	100.00	
2003	883	84,147	95.30	106.28	6.09%
2004	885	88,414	99.90	111.42	4.72%
2005	866	91,483	105.64	117.82	5.58%
2006	866	100,682	116.26	129.67	9.58%
2007	892	106,220	119.08	132.81	2.40%
2008	927	110,503	119.21	132.95	0.10%
2009	963	114,132	118.52	132.18	-0.58%
2010	920	107,412	116.73	130.18	-1.52%
2011	952	121,439	127.58	142.28	8.89%
2012	943	126,510	134.19	149.66	5.05%

Source: OPG, May 21 2014

Average growth in OPG labour costs per FTE 4.03%



UNDERTAKING J10.4

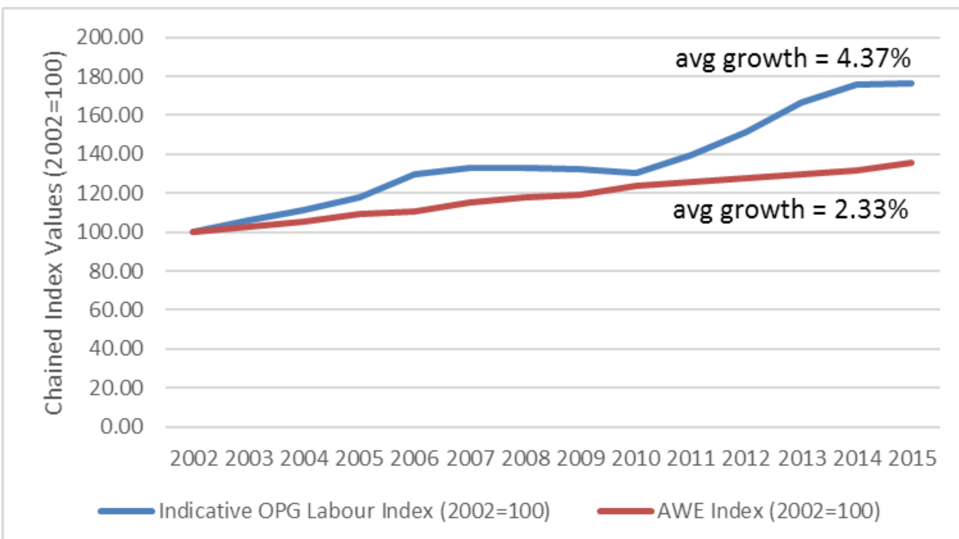
Undertaking

For LEI to extend the calculation Ontario Average Weekly Earnings table from 2012 to 2015.

Response

Please see the attached Excel file provided by LEI which extends the calculation of the average growth in OPG regulated hydroelectric labour costs per FTE to 2015, based on data provided by OPG as of March 28, 2017.[1]

Based on this data extension, the average growth in OPG regulated hydroelectric labour costs per FTE over the 2002 through 2015 period was estimated at 4.37%. As seen in the chart below, OPG's hydroelectric labour costs per FTE have been greater than the average Ontario industrial aggregate Average Weekly Earnings (AWE) since 2002.



Furthermore, based on the additional data for OPG regulated hydroelectric unit labor costs, LEI does not find any evidence to conclude that the inflationary trend in OPG's labour costs will mean revert to the slower inflationary trends observed in the Average Weekly Earnings for Ontario's industrial aggregate.

[1] Note that the O&MA costs for 2011 and 2012 used to calculate the index values in the figure above include updates that were incorporated into LEI's TFP model in 2015, so they are slightly different than the data presented at the 2014 stakeholder information session and included in response to Undertaking J10.3. These updates better reflect the removal of Lower Mattagami stations that were transferred from OPG to the Partnership in 2011.

LEI's assessment of OPG's labour costs demonstrates that using the AWE index to measure OPG's labour costs is conservative. While LEI's analysis did not account for the disallowance of compensation-related costs for 2014 and 2015, LEI concludes that using the AWE index would remain conservative if that disallowance were reflected in the company's labour costs. If the hydroelectric portion of the $100M OM&A reduction in EB-2013-0321 were applied to OPG's 2014 and 2015 labour costs,[2] OPG's labour escalation rate would have been approximately 4%. Note that this calculation applies only the estimated labour-related portion of that disallowance to reduce OPG's labour costs.[3] As a result, LEI's recommendation to use AWE as an index to reflect OPG's labour costs would remain conservative.

- Attachment 1: Undertaking J10.4 – Calculation of OPG labour cost per FTE extended to 2015

[2] The $100M OM&A disallowance is $4.5M in both 2014 and 2015 for previously regulated hydroelectric operations per EB-2013-0321 Payment Amounts Order, Appendix A, Table 1a, footnote 5, line 2b, and $7.8 in 2014 and $7.7M in 2015 for newly regulated hydroelectric operations per EB-2013-0321 Payment Amounts Order, Appendix A, Table 2a, footnote 6, line 2a

[3] LEI has assumed that the labour to non-labour weights of 64%/36% would apply to the disallowance amounts in completing the calculations. These weights are consistent with OPG's 2002-2014 average labour to non-labour costs. The resultant adjustment to labour OM&A from disallowances is $7.8M in 2014 and 2015.

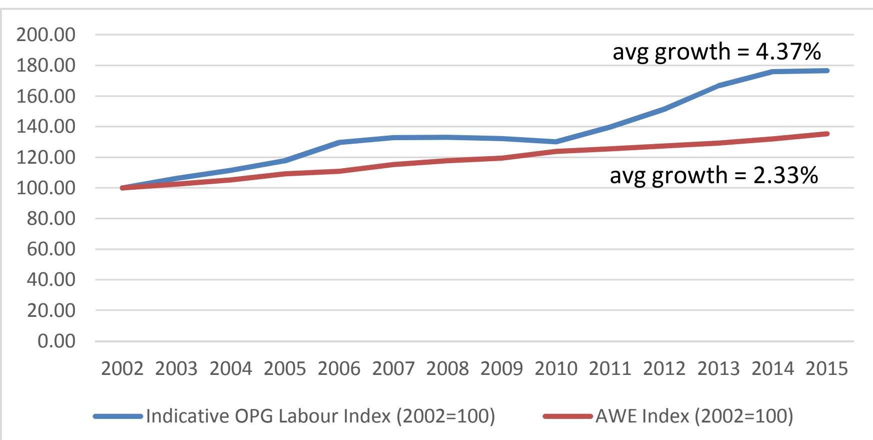
Year	FTEs I #	Labour_O M&A I K$	Labour cost per FTE	Indicative OPG Labour Index (2002=100)	Growth Rate
2002	878	78,723	89.66	100.00	
2003	883	84,147	95.30	106.28	6.09%
2004	885	88,414	99.90	111.42	4.72%
2005	866	91,483	105.64	117.82	5.58%
2006	866	100,682	116.26	129.67	9.58%
2007	892	106,220	119.08	132.81	2.40%
2008	927	110,503	119.21	132.95	0.10%
2009	963	114,132	118.52	132.18	-0.58%
2010	920	107,412	116.73	130.18	-1.52%
2011	882	110,456	125.25	139.69	7.05%
2012	851	115,567	135.74	151.39	8.04%
2013	814	121,789	149.54	166.79	9.69%
2014	760	119,907	157.72	175.91	5.32%
2015	781	123,707	158.30	176.56	0.37%

Source: OPG, Mar 28 2017

AWE (Ontario industrial aggregate)	AWE Index (2002=100)	Growth Rate
711.29	100.00	
728.70	102.45	2.42%
748.98	105.30	2.75%
776.33	109.14	3.59%
788.78	110.89	1.59%
819.18	115.17	3.78%
838.34	117.86	2.31%
849.07	119.37	1.27%
881.44	123.92	3.74%
893.44	125.61	1.35%
906.15	127.40	1.41%
920.24	129.38	1.54%
938.27	131.91	1.94%
962.73	135.35	2.57%

Source: Statcan, Table 281-0027, accessed on Mar 29 2017

Average growth in OPG Hydroelectric's labour costs per FTE (2002-2015)	4.37%
Average growth in OPG Hydroelectric's labour costs per AWE (2002-2015)	2.33%



UNDERTAKING J10.7

Undertaking

Review of page 6 of SEC's compendium K10.5, and confirm if OPG agrees with numbers and calculations.

Response

OPG's response to this undertaking is limited to an assessment of the input values and mechanical accuracy of calculations in Ex. K10.5, page 6 (the "SEC Scenario"). The SEC Scenario is a simplistic document prepared on a selective basis, and OPG does not believe that it represents a realistic forecast of the trajectory of OPG's revenues or costs during the 2017-2021 period.

OM&A Corrections

The SEC Scenario includes actual 2016 OM&A. SEC has used a 2016 actual OM&A value of $325M, as reported in note 15 of OPG's audited consolidated financial statements published on March 10, 2017. As OPG witnesses informed SEC during cross-examination, the financial statements are not reported on the same basis as otherwise filed with the OEB.[1] As a result, the 2016 actual OM&A value must be corrected to be consistent with the OEB-approved OM&A as used elsewhere in SEC Scenario. The OM&A as reported in the financial statements excludes IESO non-energy charges, which are included in the OEB-approved OM&A, but are presented as a reduction to revenue for financial statement reporting purposes. Correcting for this increases 2016 actual OM&A value by approximately $11.5M. After this correction, the 2016 actual OM&A value would be $336.5M.

The SEC scenario adds one decimal point to the OM&A Escalation Index value (e.g., moving from 2.1% to 2.06% in 2016). OPG does not object to this adjustment, but notes that it appears to be inconsistent with the OEB's methodology used to calculate the inflation index, which rounds the value to a single decimal. However, since the effect of SEC's adjustment is immaterial, OPG does not propose a correction.

CRVA Amounts in Capital Additions

SEC has removed forecast amounts for projects that OPG has identified as related to projects that may be eligible to be recorded to the Capacity Refurbishment Variance Account ("CRVA"), as identified in OPG's response to Ex. L-11.1-15 SEC-095. OPG believes that this exclusion of CRVA-related in-service capital amounts is inappropriate.

[1] Transcript, Day 10, page 64, lines 22-28.

OPG has stated that it does not believe that the CRVA should operate in such a manner as to allow it to recover costs associated with CRVA-eligible projects in payment amounts and then to recover those same costs again through disposition of the CRVA.[2] OPG's proposed approach to ensuring that no "double recovery" takes place is detailed in Ex. H1-1-2.

Since there would be no "double recovery" in connection with the recovery of amounts recorded in the CRVA under OPG's proposal, there is no basis on which forecast CRVA-eligible in-service additions should be excluded from OPG's costs for the purpose of the SEC Scenario. Capital investments related to such projects are part of OPG's capital program and should be included, as they would be in a cost of service rate setting (which the SEC Scenario attempts to emulate). OPG has corrected the SEC Scenario by re-inserting the CRVA-related in-service amounts in the 2017-2021 period that were removed by SEC.

Production Forecast Amounts

If the SEC Scenario is intended to approximate the financial performance of OPG's regulated hydroelectric facilities during the 2017-2021 period, the major inputs to the scenario should reflect the most current information available on the record or through OPG's public filings. SEC has inserted certain 2016 actual values from OPG's 2016 financial statements, but has not included the 2016 actual production.

OPG has corrected the SEC Scenario by including the 2016 actual production value found in OPG's public financial filings, as well as the forecast regulated hydroelectric production values (before SBG) per the 2017-2019 Business Plan (Ex. N1-1-1, Attachment 1, page 5). While the approved payment amounts (i.e., the "going in rates") were based on annual production of 33 TWh, the current business plan includes specific annual forecast amounts for the 2017-2021 period. The reduced production forecast in the business plan is primarily due to operational factors, and not to lower water flows. As such, OPG does not expect to recover the resulting losses in the Hydroelectric Water Conditions Variance Account.

The 2017-2021 Business Plan production forecast represents a more accurate view of OPG's production during the 2017-2021 period than the forecast prepared for 2014 and 2015 period, as filed in EB-2013-0321. Since OPG's payments are 100% variable, this reduced production relative to the amount on which payment amounts were approved, will constitute a significant challenge for OPG during the IR period.

Deficient Revenue during the IR Period

Attachment 1 to this undertaking reflects the corrections described above. The net effect of these corrections is a "prediction" in the SEC Scenario that OPG's revenues will be insufficient by $28M across the 2017-2021 period. Notwithstanding OPG's objections to

[2] Transcript, Day 10, page 33, lines 6-7.

the relevance of the SEC Scenario in an IRM proceeding, the directional implication of the corrected scenario is that OPG will be challenged to achieve its business plan under the payment amounts proposed in this application.

Attachment 1 - OPG Hydroelectric Cost Model (J10.7)

	Component	2014-2015 OEB Approved	2016	2017	2018	2019	2020	2021	2017-2021 Totals	Comparison with SEC Scenario	Notes (Changes Relative to K10.5, Page 6)
		a	b	c	d	e	f	g	h	I	
1	Gross Assets	9,290.2	9,369.2	9,551.2	9,729.2	9,915.2	10,126.2	10,321.2			
2	Accum. Depreciation	1,813.9	1,958.1	2,105.0	2,254.7	2,407.3	2,563.1	2,721.9			
3a	Net Fixed Assets	7,476.3	7,411.1	7,446.2	7,474.5	7,507.9	7,563.1	7,599.3			
3b	Working Capital & Cash Working Capital	31.4	31.4	31.4	31.4	31.4	31.4	31.4			
3c	Net Rate Base	7,507.7	7,442.5	7,477.6	7,505.9	7,539.3	7,594.5	7,630.7			
4	Weighted Average Depreciation Rate		1.54%	1.54%	1.54%	1.54%	1.54%	1.54%			
5	Expected Capital Additions		79.0	182.0	178.0	186.0	211.0	195.0			2017-2021 in-service additions as shown in Ex. L.11.1-1 SEC-095.
6	I factor		N/A	1.80%	1.80%	1.80%	1.80%	1.80%			
7	X-Factor		N/A	0.30%	0.30%	0.30%	0.30%	0.30%			
8	OM&A Escalation Index		2.06%	2.25%	2.25%	2.25%	2.25%	2.25%			
	Costs Associated with Operations										
9	GRC	350.6	350.6	346.0	352.6	349.1	334.7	330.5	1,712.9	(66.6)	Varies with on revised production (reducing GRC cost)
10	OM&A	334.9	336.5	343.1	349.8	356.6	363.5	370.6	1,783.5	31.6	Adjusted to reflect 2016 actual IESO non-energy charges
11	**Total Ops Costs**	685.5	687.1	689.1	702.4	705.6	698.3	701.1	3,496.5	(34.9)	
	Costs Associated with Capital										
12	Depreciation/Amortization	143.3	144.2	147.0	149.7	152.6	155.8	158.8	763.8	28.6	Varies with changes to capital amounts
13	Cost of Debt	199.4	197.7	198.6	199.4	200.3	201.7	202.7	1,002.8	51.3	Varies with changes to capital amounts
14	ROE	315.2	312.5	313.9	315.1	316.5	318.9	320.4	1,584.9	82.6	Varies with changes to capital amounts
15	PILs	78.6	77.9	78.3	78.6	78.9	79.5	79.9	395.2	14.6	Varies with changes to capital amounts
16	**Total Capital Related Costs**	736.5	732.3	737.8	742.8	748.3	755.9	761.8	3,746.6	177.0	
17	**Total Costs**	1,422.0	1,419.3	1,426.9	1,445.2	1,453.9	1,454.2	1,462.9	7,243.1	142.1	
18	**Less Other Revenues**	85.7	57.7	57.7	57.7	57.7	57.7	57.7	288.5	(140.0)	
19	**Net Revenue Requirement**	1,336.3	1,361.6	1,369.2	1,387.5	1,396.2	1,396.5	1,405.2	6,954.5	(282.0)	
20	Payment Amount	$41.09	$41.09	$41.71	$42.33	$42.97	$43.61	$44.27			
21	Production (TWh)	33.0	33.0	32.6	33.2	32.9	31.5	31.1			2017-2021 production amounts per Ex. N1-1-1, Attachment 1, page 5
22	Revenues	1,356.0	1,356.0	1,358.5	1,405.1	1,411.8	1,374.1	1,377.0	6,926.5	(165.2)	
23	Insufficient/Excess Revenues		**(5.7)**	**(10.7)**	**17.6**	**15.5**	**(22.4)**	**(28.1)**	**(28.0)**	(447.2)	
24	Cost-Based Payment Amount			$42.04	$41.80	$42.49	$44.32	$45.17			
25	Difference			-$0.33	$0.53	$0.47	-$0.71	-$0.90			
26	Insufficient/Excess Revenues			-10.7	17.6	15.5	-22.4	-28.1			
27	Percent			-0.78%	1.27%	1.11%	-1.60%	-2.00%			