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September 9, 2015

Ms Kirsten Walli
Board Secretary
Ontario Energy Board
2300 Yonge Street, 27th floor
PO Box 2319
Toronto, ON
M4P 1E4

RE: EB-2015-0049 & 0029 Transcript Undertakings

Dear Ms Walli,

Please find enclosed 2 copies of Transcript Undertakings J10.3 & J10.5 from GEC witnesses given during the hearing on September 1st. This completes the Undertakings from GEC.

The responses are being emailed to all parties and will be uploaded to the RESS.

Sincerely,

(Mr.) Kai Millyard
Case Manager
Green Energy Coalition

ec: All parties

Green Energy Coalition

Undertaking

To Mr. Elson

Undertaking:

GEC TO CALCULATE THE PERCENTAGE DIFFERENCE BETWEEN THE AVERAGE DSM SAVINGS OF ONTARIO AND OF THE LEADING NORTH AMERICAN JURISDICTIONS

Response:

As the following table shows, Enbridge's proposed average annual savings for the 2016 through 2020 program years are equal to approximately 62% of what the utilities in the leading jurisdictions of Massachusetts, Minnesota, Rhode Island and Vermont actually achieved in 2014; Union's proposed average annual 2016-2020 savings are equal to approximately 54% of what was achieved by utilities in those states.

As noted during cross-examination of Mr. Neme, larger utilities tend to achieve greater savings than smaller utilities. There is only one gas utility in Rhode Island and one in Vermont. However, the average 2014 savings levels that Mr. Neme reported in his pre-filed evidence for Massachusetts included data for six different utilities; the average he reported for Minnesota included data for five different utilities. If one were to consider only the biggest utilities in each of those states (National Grid in Massachusetts and Centerpoint Energy in Minnesota), both of which are still smaller than either Enbridge and Union, the comparison looks even worse for the Ontario utilities. Specifically, Enbridge's proposed 2016-2020 average annual savings are 58% of those achieved by the largest utilities in each of the four leading jurisdictions; Union's proposed 2016-2020 average annual savings are 51% of those achieved by the largest utilities in each of the four leading jurisdictions.

Witness: Chris Neme

Ontario Utilities' Forecast Savings Compared to Leading Utilities 2014 Savings Levels¹

	Ontario Utilities' Average Annual Savings (2016-2020) as % of Leaders	
	Enbridge	Union
Average of All Utilities 2014 Actual Savings in Leading Jurisdictions	62%	54%
Average of Largest Utilities 2014 Actual Savings in Leading Jurisdictions	58%	51%

Again, these are comparisons of Enbridge's and Union's proposed future 2016-2020 savings to past (2014) actual savings achieved in the leading jurisdictions. As noted by Mr. Neme, the average savings across the leading jurisdictions analyzed are expected to be higher in the future than they were in 2014.

¹ Consistent with Figure 1 in Mr. Neme's testimony, the numerator for these percentages is the Ontario utilities' forecast average annual savings from 2016 to 2020 as a percent of their total sales to customers other than power generators in 2012. The denominator is the leading jurisdictions' utilities actual 2014 savings as a percent of their total sales to customer other than power generators in 2012.

Witness: Chris Neme

Green Energy Coalition

Undertaking

To Mr. Elson

Undertaking:

GEC TO PROVIDE AMORTIZED BILL IMPACTS, BOTH INCLUDING AND EXCLUDING CARBON COST

Response:

Given the context of the discussion leading up to the undertaking, we have interpreted the request to be to provide amortized bill impacts for non-participants, or essentially impacts on rates from the combined effects of DSM spending and the benefits of efficiency that put downward pressure on rates.

Analysis Assumptions

Since the utilities have a range of choices for how to finance the amortization of DSM spending, we have developed estimates of amortized bill impacts using two different costs of capital:

1. A 4% interest rate, typical of the yields reported Canadian utility bonds; and
2. Each utility's weighted average cost of capital – 7.75% for Enbridge and 8.43% for Union.

Each of these options is discussed further below.

Utility Bond Yields

As noted above 4% is in the range of yields reported on GlobeInvestor.com for Canadian utility bonds:

Issuer	Maturity	Yield	Duration	Years to Maturity
FORTISBC ENGY	5/1/34	3.96%	11.7	18.7
TRANS CDA PIPE	4/25/30	4.54%	9.3	14.6
ENBRIDGE PIPELINE	6/11/29	4.23%	9.5	13.8
ENBRIDGE PIPELINE	11/17/27	3.99%	8.7	12.2
BELL CANADA	4/17/26	4.59%	7.3	10.6
GAZ METRO INC.	7/12/21	2.06%	5.1	5.9
BELL CANADA COUPON	12/1/18	1.97%	3.2	3.2
ALTALINK LP	12/16/16	1.26%	1.2	1.3

A new 16-year bond would have a duration (a measure of the time to the average payment) of about 11.9 years. A bond issuance that matured evenly over the next 16 years would have a substantially lower duration, under 8 years.

If the payment on the bonds is essentially guaranteed by Board orders, the utilities should be able to finance the DSM deferral at these rates without any effect on their other financing costs.

Utility Weighted Average Cost of Capital

The highest-cost financing for the deferral would be the utility's average cost of capital – 7.75% for Enbridge and 8.43% for Union.¹ Since recovery of the DSM deferral, especially through a reconciling adjustment mechanism, would be much less risky than the utility's other operations, the actual cost of financing the deferral would be less than the average cost of capital. Thus, this value represents a ceiling on the cost of financing the deferral.

Other Assumptions

Consistent with both Mr. Neme's testimony and the utilities' filed plans, we have assumed an average efficiency savings life of 16 years and assumed that DSM costs would be amortized over the same period to align the timing of DSM costs and benefits. Our analysis is also based on each utility's average annual budget and savings over the 2016 to 2020 time period – i.e. identical to the assumptions used in Table 3 of Mr. Neme's evidence. The assumed values for the benefits of efficiency that put downward pressure on rates – avoided carbon emissions, price suppression effects (DRIPE), reduced

¹ These values were provided to GEC directly by the utilities.

purchases of the most expensive gas and avoided distribution costs – are also the same as in Table 3 of Mr. Neme’s evidence.

Scenarios Analyzed

The combination of two different amortization rates and two different sets of benefits (one with avoided carbon emission reduction compliance costs and one without) leads to four different sets of results for each utility.

Analysis Results

The following table shows the effect – in just the first year – of amortizing DSM costs. When carbon benefits are excluded from the analysis, there is a modest net upward pressure on rates. The absolute magnitude of that upward pressure depends on both the utility and the amortization rate assumed (i.e. bond yield or utility weighted average cost of capital). In Enbridge’s case the impacts range from \$1.6 to \$3.3 million of upward pressure on rates in the first year; in Union’s case, the net impacts range from \$0.9 to \$2.5 million of upward pressure on rates in the first year. Those net costs are for the entire portfolio of DSM programs and would therefore be spread across all customers (residential, commercial and industrial). When the value of carbon emission reduction benefits is included in the analysis, the net impact on rates from the combined effects of the DSM budget and the efficiency benefits that put downward pressure on rates is *negative*. That is, the combined effect is net downward pressure on rates – even in the first year.

Net Impact on Rates – Across All Customers – in First Year (Millions of Dollars)

	Enbridge		Union	
	Bond (4%)	WAC C (7.75 %)	Bond (4%)	WAC C (8.43 %)
Impacts including avoided carbon emission reduction benefits	-\$2.5	-\$0.8	-\$3.2	-\$1.6
Impacts excluding avoided carbon emission reduction benefits	\$1.6	\$3.3	\$0.9	\$2.5

Witness: Chris Neme and Paul Chernick

The following table presents the results in a slightly different way – i.e. the portion of 1st year DSM budget costs that would be offset by the benefits of efficiency that put downward pressure on rates. As the table shows, when one includes carbon emission reduction benefits in the analysis, the efficiency benefits that put downward pressure on rates more than offset the upward pressure caused by the amortized DSM budget in the first year. Even when the value of carbon emission reductions is excluded from the analysis, the other benefits that put downward pressure on rates offset between 54% and 80% of the effects of the DSM budget.

Portion of 1st Year Budget Impacts Offset by Benefits Putting Downward Pressure on Rates

	Enbridge		Union	
	Bond (4%)	WAC C (7.75 %)	Bond (4%)	WAC C (8.43 %)
Impacts including avoided carbon emission reduction benefits	146%	111%	175%	128%
Impacts excluding avoided carbon emission reduction benefits	71%	54%	80%	58%

A more detailed presentation of year-by-year impacts for each utility under each of these scenarios is presented in the following tables. As the tables show, the impacts in years 2 through 16 of the DSM budget amortization are even better (i.e. more beneficial for rates) than in Year 1 when carbon benefits are included. This is because the value of carbon emission reductions are expected to grow over time (faster than the rate of inflation). The impacts in years 2 through 16 of the DSM budget amortization are slightly lower than in Year 1 when carbon benefits are excluded. This is because avoided distribution costs are expected to stay constant in nominal dollars, but decline in real dollars (by the rate of inflation).

Net Impact on Rates of Amortized DSM Budget and Efficiency Benefits - Enbridge

Year	Budgets Amortized Using Typical Utility Bond Yield (4%)										Budgets Amortized Using Enbridge's Weighted Average Cost of Capital (7.75%)									
	Net Rate Impacts w/o Carbon Benefits					Portion of Impacts Due to DSM					Net Rate Impacts w/Carbon Benefits					Portion of Impacts Due to DSM				
	Amortized Spending	Sum of Downward Pressures (including Carbon Benefits)	Net Impact (including Carbon Benefits)	Sum of Downward Pressures (excluding Carbon Benefits)	Net Impact (excluding Carbon Benefits)	Amortized Spending	Sum of Downward Pressures (including Carbon Benefits)	Net Impact (including Carbon Benefits)	Sum of Downward Pressures (excluding Carbon Benefits)	Net Impact (excluding Carbon Benefits)	Amortized Spending	Sum of Downward Pressures (including Carbon Benefits)	Net Impact (including Carbon Benefits)	Sum of Downward Pressures (excluding Carbon Benefits)	Net Impact (excluding Carbon Benefits)	Amortized Spending	Sum of Downward Pressures (including Carbon Benefits)	Net Impact (including Carbon Benefits)	Sum of Downward Pressures (excluding Carbon Benefits)	Net Impact (excluding Carbon Benefits)
1	\$5,451,919	(\$2,503,171)	(\$2,768,586)	\$2,768,586	146%	\$5,451,919	\$1,567,874	\$1,612,963	\$1,567,874	71%	\$7,149,166	(\$7,955,090)	(\$805,924)	\$805,924	111%	\$7,149,166	(\$3,884,045)	\$3,265,121	\$3,884,045	54%
2	\$5,451,919	(\$2,768,586)	(\$2,768,586)	\$2,768,586	151%	\$5,451,919	\$1,612,963	\$1,612,963	\$1,612,963	70%	\$7,149,166	(\$8,220,505)	(\$1,071,339)	\$1,071,339	115%	\$7,149,166	(\$3,838,956)	\$3,310,210	\$3,838,956	54%
3	\$5,451,919	(\$3,034,746)	(\$3,034,746)	\$3,034,746	156%	\$5,451,919	\$1,657,307	\$1,657,307	\$1,657,307	70%	\$7,149,166	(\$8,486,665)	(\$1,337,499)	\$1,337,499	119%	\$7,149,166	(\$3,794,613)	\$3,354,553	\$3,794,613	53%
4	\$5,451,919	(\$3,301,638)	(\$3,301,638)	\$3,301,638	161%	\$5,451,919	\$1,700,918	\$1,700,918	\$1,700,918	69%	\$7,149,166	(\$8,753,558)	(\$1,604,392)	\$1,604,392	122%	\$7,149,166	(\$3,751,002)	\$3,398,164	\$3,751,002	52%
5	\$5,451,919	(\$3,534,751)	(\$3,534,751)	\$3,534,751	165%	\$5,451,919	\$1,743,808	\$1,743,808	\$1,743,808	68%	\$7,149,166	(\$8,986,670)	(\$1,837,504)	\$1,837,504	126%	\$7,149,166	(\$3,708,111)	\$3,441,055	\$3,708,111	52%
6	\$5,451,919	(\$3,803,073)	(\$3,803,073)	\$3,803,073	170%	\$5,451,919	\$1,785,990	\$1,785,990	\$1,785,990	67%	\$7,149,166	(\$9,254,992)	(\$2,105,826)	\$2,105,826	129%	\$7,149,166	(\$3,665,929)	\$3,483,237	\$3,665,929	51%
7	\$5,451,919	(\$4,072,091)	(\$4,072,091)	\$4,072,091	175%	\$5,451,919	\$1,827,475	\$1,827,475	\$1,827,475	66%	\$7,149,166	(\$9,524,010)	(\$2,374,844)	\$2,374,844	133%	\$7,149,166	(\$3,624,444)	\$3,524,722	\$3,624,444	51%
8	\$5,451,919	(\$4,341,795)	(\$4,341,795)	\$4,341,795	180%	\$5,451,919	\$1,868,274	\$1,868,274	\$1,868,274	66%	\$7,149,166	(\$9,793,715)	(\$2,644,548)	\$2,644,548	137%	\$7,149,166	(\$3,583,645)	\$3,565,521	\$3,583,645	50%
9	\$5,451,919	(\$4,612,173)	(\$4,612,173)	\$4,612,173	185%	\$5,451,919	\$1,908,400	\$1,908,400	\$1,908,400	65%	\$7,149,166	(\$10,064,093)	(\$2,914,927)	\$2,914,927	141%	\$7,149,166	(\$3,543,520)	\$3,605,646	\$3,543,520	50%
10	\$5,451,919	(\$4,883,215)	(\$4,883,215)	\$4,883,215	190%	\$5,451,919	\$1,947,862	\$1,947,862	\$1,947,862	64%	\$7,149,166	(\$10,335,134)	(\$3,185,968)	\$3,185,968	145%	\$7,149,166	(\$3,504,057)	\$3,645,109	\$3,504,057	49%
11	\$5,451,919	(\$5,154,508)	(\$5,154,508)	\$5,154,508	195%	\$5,451,919	\$1,986,672	\$1,986,672	\$1,986,672	64%	\$7,149,166	(\$10,606,827)	(\$3,457,661)	\$3,457,661	148%	\$7,149,166	(\$3,465,247)	\$3,683,919	\$3,465,247	48%
12	\$5,451,919	(\$5,426,244)	(\$5,426,244)	\$5,426,244	203%	\$5,451,919	\$2,024,841	\$2,024,841	\$2,024,841	63%	\$7,149,166	(\$11,086,164)	(\$3,936,998)	\$3,936,998	155%	\$7,149,166	(\$3,427,078)	\$3,722,088	\$3,427,078	48%
13	\$5,451,919	(\$5,697,712)	(\$5,697,712)	\$5,697,712	213%	\$5,451,919	\$2,062,380	\$2,062,380	\$2,062,380	62%	\$7,149,166	(\$11,600,631)	(\$4,451,465)	\$4,451,465	162%	\$7,149,166	(\$3,389,539)	\$3,759,627	\$3,389,539	47%
14	\$5,451,919	(\$5,969,300)	(\$5,969,300)	\$5,969,300	222%	\$5,451,919	\$2,099,298	\$2,099,298	\$2,099,298	61%	\$7,149,166	(\$12,081,219)	(\$4,932,053)	\$4,932,053	169%	\$7,149,166	(\$3,352,621)	\$3,796,545	\$3,352,621	47%
15	\$5,451,919	(\$6,241,117)	(\$6,241,117)	\$6,241,117	231%	\$5,451,919	\$2,135,606	\$2,135,606	\$2,135,606	61%	\$7,149,166	(\$12,596,917)	(\$5,447,751)	\$5,447,751	176%	\$7,149,166	(\$3,316,313)	\$3,832,853	\$3,316,313	46%
16	\$5,451,919	(\$6,512,955)	(\$6,512,955)	\$6,512,955	241%	\$5,451,919	\$2,171,315	\$2,171,315	\$2,171,315	60%	\$7,149,166	(\$13,113,215)	(\$5,964,049)	\$5,964,049	183%	\$7,149,166	(\$3,280,605)	\$3,868,561	\$3,280,605	46%
NPV	\$63,527,375	(\$115,177,852)	(\$51,650,477)	\$51,650,477	181%	\$63,527,375	\$21,532,725	\$21,532,725	\$21,532,725	66%	\$83,304,196	(\$115,177,852)	(\$31,873,656)	\$31,873,656	138%	\$83,304,196	(\$41,994,650)	\$41,309,546	\$41,994,650	50%

Witness: Chris Neme and Paul Chernick

Net Impact on Rates of Amortized DSM Budget and Efficiency Benefits - Union

Year	Budgets Amortized Using Typical Utility Bond Yield (4%)										Budgets Amortized Using Union's Weighted Average Cost of Capital (8.43%)									
	Net Rate Impacts w/Carbon Benefits					Portion of Impacts Due to DSM					Net Rate Impacts w/o Carbon Benefits					Portion of Impacts Due to DSM				
	Amortized DSM Spending	Sum of Downward Pressures (Including Carbon Benefits)	Net Impact (Including Carbon Benefits)	Sum of Downward Pressures (excluding Carbon Benefits)	Net Impact (Excluding Carbon Benefits)	Amortized DSM Spending	Sum of Downward Pressures (Including Carbon Benefits)	Net Impact (Including Carbon Benefits)	Sum of Downward Pressures (excluding Carbon Benefits)	Net Impact (Excluding Carbon Benefits)	Amortized DSM Spending	Sum of Downward Pressures (Including Carbon Benefits)	Net Impact (Including Carbon Benefits)	Sum of Downward Pressures (excluding Carbon Benefits)	Net Impact (Excluding Carbon Benefits)	Amortized DSM Spending	Sum of Downward Pressures (Including Carbon Benefits)	Net Impact (Including Carbon Benefits)	Sum of Downward Pressures (excluding Carbon Benefits)	Net Impact (Excluding Carbon Benefits)
1	\$4,321,341	(\$7,562,269)	(\$3,240,928)	(\$3,451,247)	\$870,094	80%	\$4,321,341	(\$7,562,269)	(\$1,632,270)	(\$3,451,247)	\$2,478,752	58%	\$4,321,341	(\$7,562,269)	(\$1,632,270)	128%	\$4,321,341	(\$7,562,269)	(\$1,632,270)	128%
2	\$4,321,341	(\$7,846,625)	(\$3,525,284)	(\$3,422,050)	\$899,290	79%	\$4,321,341	(\$7,846,625)	(\$1,916,626)	(\$3,422,050)	\$2,507,949	58%	\$4,321,341	(\$7,846,625)	(\$1,916,626)	132%	\$4,321,341	(\$7,846,625)	(\$1,916,626)	132%
3	\$4,321,341	(\$8,131,463)	(\$3,810,122)	(\$3,393,336)	\$928,005	79%	\$4,321,341	(\$8,131,463)	(\$2,201,464)	(\$3,393,336)	\$2,536,663	57%	\$4,321,341	(\$8,131,463)	(\$2,201,464)	137%	\$4,321,341	(\$8,131,463)	(\$2,201,464)	137%
4	\$4,321,341	(\$8,416,776)	(\$4,095,435)	(\$3,365,096)	\$956,245	78%	\$4,321,341	(\$8,416,776)	(\$2,486,777)	(\$3,365,096)	\$2,564,903	57%	\$4,321,341	(\$8,416,776)	(\$2,486,777)	142%	\$4,321,341	(\$8,416,776)	(\$2,486,777)	142%
5	\$4,321,341	(\$8,667,716)	(\$4,346,375)	(\$3,337,323)	\$984,018	77%	\$4,321,341	(\$8,667,716)	(\$2,737,717)	(\$3,337,323)	\$2,592,676	56%	\$4,321,341	(\$8,667,716)	(\$2,737,717)	146%	\$4,321,341	(\$8,667,716)	(\$2,737,717)	146%
6	\$4,321,341	(\$8,953,954)	(\$4,632,613)	(\$3,310,009)	\$1,011,332	77%	\$4,321,341	(\$8,953,954)	(\$3,023,955)	(\$3,310,009)	\$2,619,990	56%	\$4,321,341	(\$8,953,954)	(\$3,023,955)	151%	\$4,321,341	(\$8,953,954)	(\$3,023,955)	151%
7	\$4,321,341	(\$9,240,644)	(\$4,919,303)	(\$3,283,146)	\$1,038,195	76%	\$4,321,341	(\$9,240,644)	(\$3,310,644)	(\$3,283,146)	\$2,646,853	55%	\$4,321,341	(\$9,240,644)	(\$3,310,644)	156%	\$4,321,341	(\$9,240,644)	(\$3,310,644)	156%
8	\$4,321,341	(\$9,527,777)	(\$5,206,436)	(\$3,256,727)	\$1,064,614	75%	\$4,321,341	(\$9,527,777)	(\$3,597,778)	(\$3,256,727)	\$2,673,273	55%	\$4,321,341	(\$9,527,777)	(\$3,597,778)	161%	\$4,321,341	(\$9,527,777)	(\$3,597,778)	161%
9	\$4,321,341	(\$9,815,347)	(\$5,494,006)	(\$3,230,744)	\$1,090,597	75%	\$4,321,341	(\$9,815,347)	(\$3,885,348)	(\$3,230,744)	\$2,699,255	54%	\$4,321,341	(\$9,815,347)	(\$3,885,348)	166%	\$4,321,341	(\$9,815,347)	(\$3,885,348)	166%
10	\$4,321,341	(\$10,103,346)	(\$5,782,005)	(\$3,205,190)	\$1,116,150	74%	\$4,321,341	(\$10,103,346)	(\$4,173,347)	(\$3,205,190)	\$2,724,809	54%	\$4,321,341	(\$10,103,346)	(\$4,173,347)	170%	\$4,321,341	(\$10,103,346)	(\$4,173,347)	170%
11	\$4,321,341	(\$10,391,767)	(\$6,070,426)	(\$3,180,059)	\$1,141,282	74%	\$4,321,341	(\$10,391,767)	(\$4,461,768)	(\$3,180,059)	\$2,749,940	54%	\$4,321,341	(\$10,391,767)	(\$4,461,768)	175%	\$4,321,341	(\$10,391,767)	(\$4,461,768)	175%
12	\$4,321,341	(\$10,889,639)	(\$6,568,298)	(\$3,155,343)	\$1,165,997	73%	\$4,321,341	(\$10,889,639)	(\$4,959,640)	(\$3,155,343)	\$2,774,656	53%	\$4,321,341	(\$10,889,639)	(\$4,959,640)	184%	\$4,321,341	(\$10,889,639)	(\$4,959,640)	184%
13	\$4,321,341	(\$11,422,758)	(\$7,101,417)	(\$3,131,036)	\$1,190,305	72%	\$4,321,341	(\$11,422,758)	(\$5,492,759)	(\$3,131,036)	\$2,798,963	53%	\$4,321,341	(\$11,422,758)	(\$5,492,759)	193%	\$4,321,341	(\$11,422,758)	(\$5,492,759)	193%
14	\$4,321,341	(\$11,921,439)	(\$7,600,099)	(\$3,107,130)	\$1,214,211	72%	\$4,321,341	(\$11,921,439)	(\$5,991,440)	(\$3,107,130)	\$2,822,869	52%	\$4,321,341	(\$11,921,439)	(\$5,991,440)	201%	\$4,321,341	(\$11,921,439)	(\$5,991,440)	201%
15	\$4,321,341	(\$12,455,355)	(\$8,134,014)	(\$3,083,619)	\$1,237,722	71%	\$4,321,341	(\$12,455,355)	(\$6,525,356)	(\$3,083,619)	\$2,846,380	52%	\$4,321,341	(\$12,455,355)	(\$6,525,356)	210%	\$4,321,341	(\$12,455,355)	(\$6,525,356)	210%
16	\$4,321,341	(\$12,989,659)	(\$8,668,319)	(\$3,060,496)	\$1,260,844	71%	\$4,321,341	(\$12,989,659)	(\$7,059,660)	(\$3,060,496)	\$2,869,503	52%	\$4,321,341	(\$12,989,659)	(\$7,059,660)	219%	\$4,321,341	(\$12,989,659)	(\$7,059,660)	219%
NPV	\$50,353,540	(\$112,003,617)	(\$61,650,077)	(\$38,101,780)	\$12,251,760	76%	\$50,353,540	(\$112,003,617)	(\$42,905,514)	(\$38,101,780)	\$30,996,323	55%	\$50,353,540	(\$112,003,617)	(\$42,905,514)	162%	\$50,353,540	(\$112,003,617)	(\$42,905,514)	162%

Witness: Chris Neme and Paul Chernick