EB-2016-0160

Hydro One Networks Inc. Transmission Application for electricity transmission revenue requirement and related changes to the Uniform Transmission Rates beginning January 1, 2017 and January 1, 2018

VULNERABLE ENERGY CONSUMERS COALITION
("VECC")
CROSS-EXAMINATION
COMPENDIUM PANEL 9
LOAD FORECAST AND RATE DESIGN

November 28, 2016

INDEX

TAB 1

Table 3: Load Forecast Before and After Embedded Generation and CDM

(12-Month Average Peak in MW)

Year	Ontario Demand (MW)	Charge Determinant: Network Connection (MW)	Charge Determinant: Line Connection (MW)	Charge Determinant: Transformation Connection (MW)
Load Forecast before Deducting Impacts of Embedded Generation and CDM				
2015	22,353	22,389	21,622	18,479
2016	22,606	22,642	21,862	18,685
2017	22,784	22,820	22,034	18,832
2018	23,105	23,142	22,344	19,096
Load Impact of Embedded Generation				
2015	716	717	655	560
2016	735	736	673	575
2017	773	774	709	606
2018	803	805	737	630
Load Impact of CDM				
2015	1,434	1,436	1,390	1,188
2016	1,638	1,641	1,584	1,354
2017	1,638	1,641	1,584	1,354
2018	1,924	1,927	1,860	1,590
Load Forecast after Deducting Embedded Generation and CDM				
2015	20,203	20,236	19,576	16,731
2016	20,233	20,265	19,605	16,756
2017	20,373	20,405	19,741	16,872
2018	20,378	20,410	19,746	16,876

Note: All figures are weather-normal.

Before adjusting for the load impacts arising from embedded generation and CDM, Hydro One Transmission is forecast to deliver an average of 22,606 MW in 2016 (12-month average peak), 22,784 MW in 2017, and 23,105 MW in 2018. After deducting the

load impacts of embedded generation and CDM, Hydro One Transmission is forecast to deliver an average of 20,233 MW in 2016 (12-month average peak), to 20,373 MW in 2017, and 20,378 MW in 2018.

The forecast is weather-normal and the actual load could be below or above the forecast depending on the weather conditions and/or a different economic growth pattern. Table 4 of this Exhibit presents the upper and lower bands associated with one standard deviation for the charge determinant forecast. Based on historical data, there is a two-in-three chance that the actual load in 2016, 2017, and 2018 will fall within the upper and lower bands. The bands are derived using Monte Carlo simulation technique relating variations in load to variations in Ontario GDP and weather.

Table 4: One Standard Deviation Uncertainty Bands for Hydro One Transmission's Charge Determinants (Using Current Rates) (MW)

Year	Lower Band	Forecast	Upper Band
Network			
2015 (Actual)	20,236	20,236	20,236
2016	19,895	20,265	20,639
2017	19,916	20,405	20,897
2018	19,862	20,410	20,956
Line Connection			
2015 (Actual)	19,497	19,576	20,222
2016	19,248	19,605	19,964
2017	19,267	19,741	20,216
2018	19,218	19,746	20,275
Transformation Connection			
2015 (Actual)	16,742	16,731	17,363
2016	16,452	16,756	17,063
2017	16,467	16,872	17,278
2018	16,425	16,876	17,325

6. VARIABILITY OF HYDRO ONE'S LOAD FORECASTS

Hydro One has significant expertise in preparing provincial electricity demand forecasts as well as hourly load shape analysis. As part of the load research work associated with EB-2005-0317, Hydro One prepared the load shape analysis for over 80 LDCs in Ontario for use in their distribution rate applications to the OEB, using same load-shape methodology used in this Application. The performance of Hydro One's transmission system load forecast since 1999 has been consistently accurate as shown in Table 5.

TAB 2

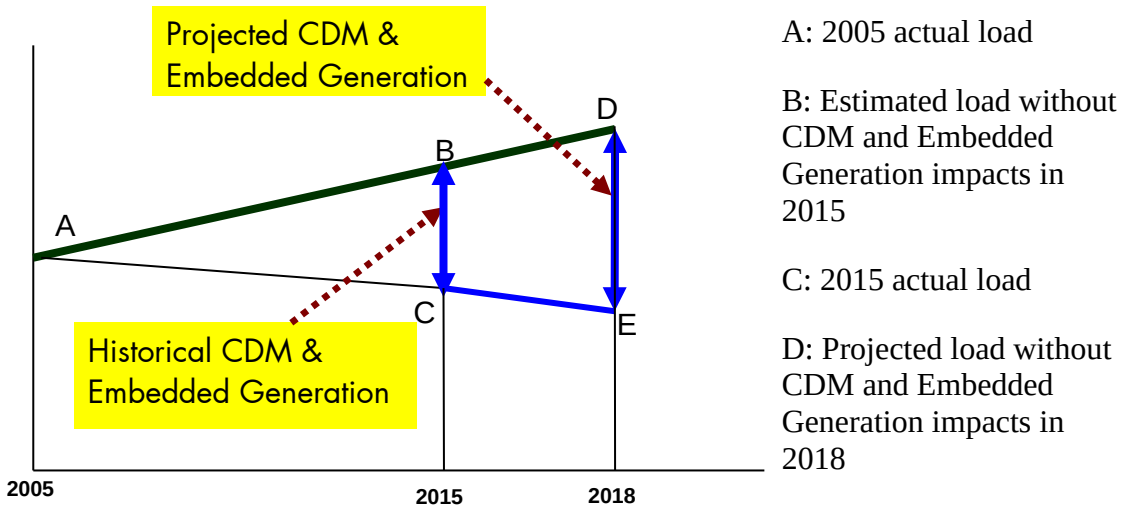


Figure 2: Incorporation of CDM and Embedded Generation in the Load Forecast

The derivation of each of the customer forecast and the customer delivery point forecast is addressed in sections 4.3 and 4.4 of this Exhibit, respectively

4.1 Weather Correction Analysis

Weather correction analysis is a statistical process that removes the abnormal or extreme weather effects from the load data to yield average conditions that reflect the more normal or expected weather that is used in the forecast. This is essential because the volatility of abnormal or extreme weather conditions can adversely impact the provision of a consistent and meaningful forecast for load growth. Hourly load data and hourly weather data of various weather stations across the province are used in the analysis.

TAB 3

Vulnerable Energy Consumers Coalition (VECC) INTERROGATORY #027

Reference:

Exhibit E1/Tab 3/Schedule 1, pages 6-8 (Table 2)

Interrogatory:

a) With reference to Table 2, please confirm that the values for 2006-2015 are actual values and those for 2016-2018 are forecast.

b) Please provide the source and supporting documentation for the actual values reported.

c) Please provide a breakdown of the actual values reported for each year as between the three CDM categories described on page 7 (lines 8-11).

d) Please clarify whether the actual results reported for each year represent actual savings or annualized savings assuming all initiatives implemented during the year were in place as of January 1.

e) Please confirm whether the demand response savings reported for each year (per the response to part c)) represent the actual load reductions achieved through the of activation demand response contracts or the MW of demand response under contract. In responding please provide the references/documentation supporting the response.

Response:

a) The values in Table 2 for 2006-2014 are actual figures and those for 2015-2018 are forecast as discussed with the IESO.

b) The requested information is provided below.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
EE	289	778	893	997	1167	1318	1470	1621	1820	1942	2167	2099	2391
Data Source	OPA 2011 IPSP (Integrated Power Sysetm Plan)							OPA 2013 LTEP (Long Term Energy Plan)					
Actual /Forecast	IESO Assumes the savings from EE programs in 2006-2014 are same as forcast in the IPSP and LTEP												

c) The requested information is provided below. Please note that a breakdown for energy efficiency programs ("EE") and codes and standards ("C&S") is not available for the years 2006 to 2012.

Peak Demand Reduction Associated with Energy Savings Targets

Peak Demand Saving (MW)	2006	2007	2008	2009	2010	2011	2012	2013	2014
EE								1,248	1,435
C&S								373	386
Total of EE + C&S in LTEP	289	778	893	997	1,167	1,318	1,470	1,621	1,820
IESO assumed Actual	289	778	893	997	1,167	1,318	1,470	1,621	1,820

**peak savings from EE and C&S assume the same as forecast in LTEP (Slide 7, http://www.ieso.ca/Documents/LTEP/2014-Actual-vs-2014-Forecast-in-LTEP.pdf)*

Peak Reduction from Existing and Future Demand Response Resources

Peak Demand Saving (MW)	2006	2007	2008	2009	2010	2011	2012	2013	2014
LTEP 2013	305	388	646	609	504	498	519	1352	1399
Actual Impact (as of December 2015)	305	388	646	609	504	498	519	1613*	1589**

** IESO, "LTEP: Comparison of 2013 Forecast vs 2013 Actual Results", Slide 8 (http://www.ieso.ca/Documents/LTEP/LTEP-module-update-2013-forecast-to-actual-20150617-final-June-17-2015.pdf)*

*** IESO, "LTEP: Comparison of 2014 Forecast vs 2014 Actual Results", Slide 8 (http://www.ieso.ca/Documents/LTEP/2014-Actual-vs-2014-Forecast-in-LTEP.pdf)*

d) Based on consultation with the IESO, the actual peak saving results reported by the IESO for each year represent actual savings.

e) The demand management savings reported for each year, as reflected in c) above, represent the actual load reductions achieved through the activation of demand response programs (e.g. DR2, DR3, and peaksaverPLUS), time-of-use peak reduction, and industrial conservation initiative on peak days. Please see c) above for the supporting references.

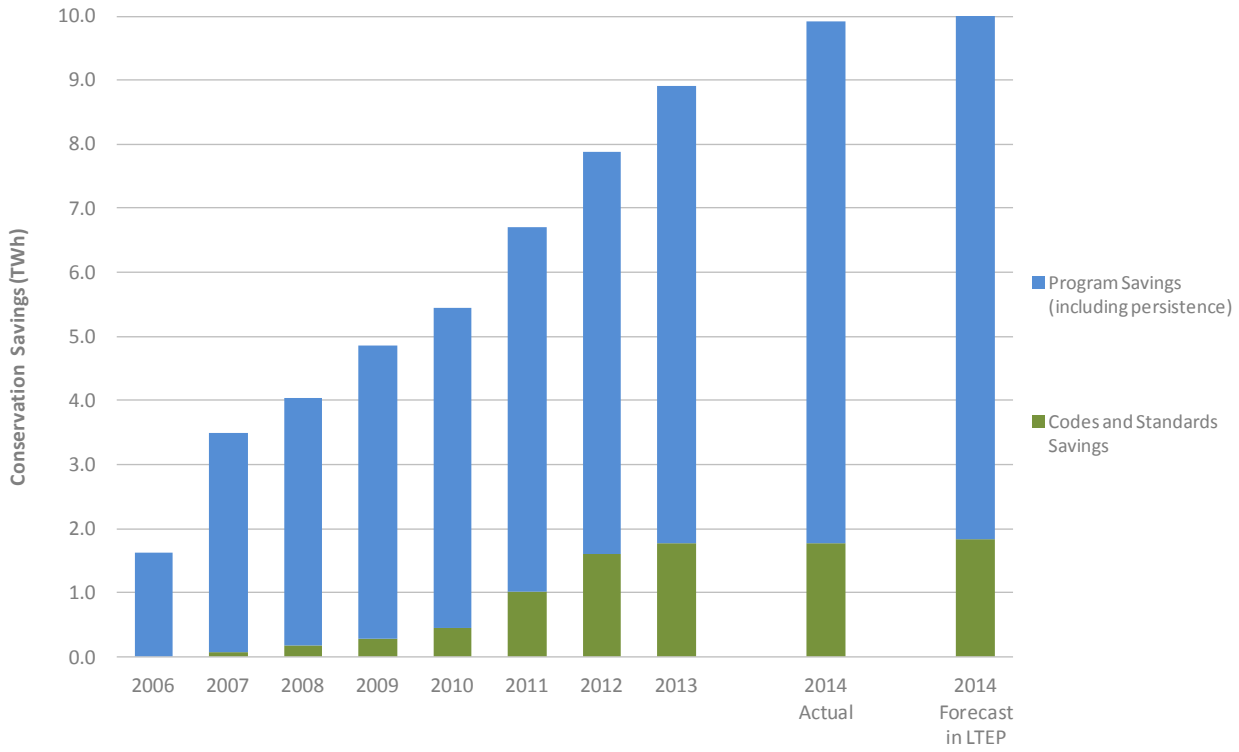
TAB 4

LTEP: Comparison of 2014 Forecast vs. 2014 Actual Results

December 2015

ieso
Connecting Today.
Powering Tomorrow.

Conservation energy savings



Results:

- Total energy savings between 2006 and 2014 are 9.9 TWh, which is about 200 GWh (-2%) lower than the 2013 LTEP forecast

Notes:

- Savings are at the generator level, and include transmission and distribution losses
- Savings from conservation programs are between 2006 and 2014 including persistence. Savings from codes and standards are between 2006 and 2013 and assume the same as forecast in LTEP. Forecast new 2014 savings from codes and standards are not included. Evaluation of savings from codes and standards is under way.

TAB 5

Vulnerable Energy Consumers Coalition (VECC) INTERROGATORY #036

Reference:

Exhibit F1/T1/S1, pages 3 and 9

Interrogatory:

a) Please provide the detailed calculations supporting the annual additions to the LDC CDM and Demand Response Variance Account including:

- The annual forecast and actual CDM savings and Demand Response amounts (separately) used in the calculation, with supporting sources for the values used.
- How the actual reported CDM and Demand Response results were translated into impact on the transmission billing determinants.
- The rates used and resulting calculation of the dollar impacts due to difference between forecast and actual CDM and Demand Response results.

Response:

The detailed calculations supporting the annual additions to the Hydro One CDM and Demand Reponse variance account for 2013 and 2014 are provided in the attached PDF files.

Filed: 2016-08-31
EB-2016-0160
Exhibit I-12-036
Attachment 2
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2014 Variance Account on CDM and Demand Response

Economic and Load Forecasting

September 2015

2014 CDM Variance - EE

Month	(1) Forecast	(2) Actual	(3)=(1)-(2) Variance
1	484	364	119
2	480	362	118
3	447	337	110
4	464	350	114
5	506	381	124
6	690	520	170
7	748	564	184
8	680	513	167
9	609	459	150
10	450	339	111
11	459	346	113
12	487	367	120
12 Month Average	542	409	133

Note:

- Target EE peak saving in July based on IESO's Final verified 2011-2014 CDM report
- Peak saving for other months is estimated based on IESO's saving profile

TAB 6

London Property Management Association (LPMA) INTERROGATORY #047

Reference:

Exhibit F1, Tab 1, Schedule 2

Interrogatory:

a) Please provide the CDM forecast built into the 2015 and 2016 forecasts in EB-2014-0140.

b) Please provide the actual CDM in 2015 and the most recent estimate of the CDM projected for 2016.

c) If the LDC CDM and Demand Response Variance Account had been in place for 2015 and 2016, please show the amount that would be included in the account for each year and whether it would be a credit or a charge to ratepayers.

Response:

a) The CDM peak impacts assumed in Hydro One's transmission system load forecast for 2015 and 2016 in EB-2014-0140 are as follows:

	CDM impact on peak demand (MW)
2015	3,014
2016	3,250

b) The actual CDM in 2015 is not available from the IESO. There is no change to the CDM projection for 2016.

c) Hydro One is not able to calculate what the CDM variances for 2015 and 2016 would have been. The 2015 and 2016 actual peak saving results from the IESO are not available.

TAB 7

VECC-48

Reference: Exhibit I/Tab 4/Schedule 47, part b) / Exhibit I/Tab 12/Schedule 28

a) VECC is aware that the IESO has produced 2015 Verified Results for individual distributors. VECC also notes (per VECC #28 a)) that the actual results for 2014 were available as of June 2015. When does Hydro One expect that 2015 province-wide results will be available?

Response:

a) The IESO has produced a detailed, 2015 annual verified conservation results report for each LDC in Ontario. The reports track the progress of each LDC against its individual six-year target in terms of energy saving, but not peak savings because there are no peak targets established. The reports are available at http://www.ieso.ca/Pages/Conservation/Conservation-First-Framework/2015-LDC-Conservation-Results.aspx.

TAB 8

Final 2015 Annual Verified Results Report

Letter from the Vice-President, Conservation & Corporate Relations

June 30, 2016

The IESO is pleased to provide the Final 2015 Annual Verified Results Report including final 2015 Project Lists and EM&V Key Findings & FAQs. Collectively LDCs achieved 1.1 TWh of energy savings persisting to 2020 – representing 16% of the 7 TWh target. These results were achieved through both Legacy Framework and Conservation First Framework (CFF) programs. The results indicate a smooth transition between frameworks and demonstrate the continued collaboration between LDCs and the IESO in promoting a culture of conservation across the province.

The IESO remains committed to supporting LDCs in the delivery of conservation programs and 2015 marked some significant milestones, including the completion and approval of over 40 CDM plans and the implementation of 14 pilot programs and 5 local programs. Other highlights include:

- Business sector accounted for 79% of the net energy savings persisting to 2020 with the remainder 21% through the Residential sector.
- The Coupons program shifted toward ENERGY STAR® rated LED lighting, accounting for roughly 90% of coupons redeemed.
- The Retrofit program participation increased nearly 20%, and net energy savings increased by over 50% over 2014 results. Net-to-gross adjustments are trending higher than previous years, minimum of a 75% net-to-gross in all regions.
- The Process & Systems Upgrades program achieved a 20% increase in Capital Incentive projects totalling 12 in all, including 4 Behind-the-Meter Generation, and a broad spectrum of industrial processes and end-

2015 also marks the first year that regional and local net-to-gross values have been employed where possible in certain programs, providing LDCs with a more granular analysis on their individual results.

CFF provides many opportunities to support LDCs in achieving their energy targets and delivering value to customers. Through increased flexibility for LDCs to design and deliver programs based on local needs and fostering collaboration and innovation through enhanced program funding opportunities we are well positioned to achieve success in delivering effective conservation programs to all customers.

We appreciate your collaboration and cooperation throughout the reporting and evaluation process and as we look ahead to the remainder of 2016, the IESO will be focusing on improving its communication and support services to further enhance the participation in conservation programs for both LDCs and customers.

Please continue to monitor Save on Energy E-blasts for future updates and should you have any other questions or comments please contact LDC.Support@ieso.ca.

I look forward to continuing to work together in achieving success in the Conservation First Framework.

Sincerely,

Terry Young
Vice-President, Conservation & Corporate Relations
Independent Electricity System Operator

2015 Verified Province-Wide Results

Province-Wide Progress

#	Programs	Participation >	Progress Towards 2020 Net Annual Energy Savings Target >	Net Incremental First Year Energy Savings >	Net Incremental First Year Peak Demand Savings																	
					CDM Plan Forecast Reported (kW)							Actual Verified (kW)						Progress vs. CDM Plan (%)					
					2015	2016	2017	2018	2019	2020	Total	2015	2016	2017	2018	2019	2020 Total	2015	2016	2017	2018	2019	2020 Total
2011-2014+2015 Extension Legacy Framework Programs																							
Residential Program																							
1	Coupon Initiative				1,426						**1,426**	3,285					**3,285**	230%					**230%**
2	Bi-Annual Retailer Event Initiative				1,917						**1,917**	5,100					**5,100**	266%					**266%**
3	Appliance Retirement Initiative				1,036						**1,036**	1,027					**1,027**	99%					**99%**
4	HVAC Incentives Initiative				20,618						**20,618**	24,035					**24,035**	117%					**117%**
5	Residential New Construction and Major Renovation Initiative				0						**0**	1,113					**1,113**						
Sub-total - Residential Program					**24,997**						**24,997**	**34,560**					**34,560**	**138%**					**138%**
Commercial & Institutional Program																							
6	Energy Audit Initiative				1,821						**1,821**	5,614					**5,614**	308%					**308%**
7	Efficiency: Equipment Replacement Incentive Initiative				70,109						**70,109**	93,596					**93,596**	134%					**134%**
8	Direct Install Lighting and Water Heating Initiative				16,601						**16,601**	11,893					**11,893**	72%					**72%**
9	New Construction and Major Renovation Initiative				5,495						**5,495**	5,222					**5,222**	95%					**95%**
10	Existing Building Commissioning Incentive Initiative				783						**783**	437					**437**	56%					**56%**
Sub-total - Commercial & Institutional Program					**94,809**						**94,809**	**116,762**					**116,762**	**123%**					**123%**
Industrial Program																							
11	Process and Systems Upgrades Initiatives - Project Incentive Initiative				44,236						**44,236**	13,649					**13,649**	31%					**31%**
12	Process and Systems Upgrades Initiatives - Monitoring and Targeting Initiative				143						**143**	0					**0**	0%					**0%**
13	Process and Systems Upgrades Initiatives - Energy Manager Initiative				3,791						**3,791**	7,590					**7,590**	200%					**200%**
Sub-total - Industrial Program					**48,170**						**48,170**	**21,239**					**21,239**	**44%**					**44%**
Low Income Program																							
14	Low Income Initiative				7,758						**7,758**	2,225					**2,225**	29%					**29%**
Sub-total - Low-Income Program					**7,758**						**7,758**	**2,225**					**2,225**	**29%**					**29%**
Pilot Program																							
15	Loblaws Pilot				0						**0**	724					**724**						
16	Social Benchmarking Pilot				0						**0**	1,649					**1,649**						
17	Conservation Fund Pilot - SEG				0						**0**	1,055					**1,055**						
18	Conservation Fund Pilot - EnerNOC				0						**0**	0					**0**						
Sub-total - Pilot Program					**0**						**0**	**3,428**					**3,428**						
Other																							
19	Aboriginal Conservation Program				0						**0**	625					**625**						
20	Program Enabled Savings				n/a						**0**	1,145					**1,145**						
21	Adjustments to 2015 Legacy Framework Verified Results				n/a						**0**	0					**0**						
Sub-total - Other					**0**						**0**	**1,770**					**1,770**						
Sub-total - 2011-2014+2015 Extension Legacy Framework					**175,734**						**175,734**	**179,984**					**179,984**	**102%**					**102%**
2015-2020 Conservation First Framework Programs																							
Residential Province-Wide Program																							
22	Save on Energy Coupon Program				416	3,539	3,685	3,569	3,248	3,090	**17,547**	2,025					**2,025**	487%					**12%**
23	Save on Energy Heating and Cooling Program				1,806	18,347	13,914	11,980	12,104	11,834	**69,985**	5,322					**5,322**	295%					**8%**
24	Save on Energy New Construction Program				87	1,393	1,375	1,420	1,366	1,408	**7,049**	0					**0**	0%					**0%**
25	Save on Energy Home Assistance Program				313	6,559	6,435	6,295	6,245	6,215	**32,062**	213					**213**	68%					**1%**
Sub-total - Residential Province-Wide Program					**2,622**	**29,838**	**25,409**	**23,264**	**22,963**	**22,547**	**126,643**	**7,560**					**7,560**	**288%**					**6%**
Business Province-Wide Program																							
26	Save on Energy Audit Funding Program				205	2,241	2,394	2,357	2,278	2,015	**11,490**	35					**35**	17%					**0%**
27	Save on Energy Retrofit Program				9,937	80,144	83,912	71,001	71,370	71,359	**387,723**	2,828					**2,828**	28%					**1%**
28	Save on Energy Small Business Lighting Program				119	16,459	18,087	14,685	12,429	12,219	**73,998**	0					**0**	0%					**0%**
29	Save on Energy High Performance New Construction Program				44	4,202	4,316	4,298	4,546	4,149	**21,555**	0					**0**	0%					**0%**
30	Save on Energy Existing Building Commissioning Program				0	945	1,057	1,057	1,057	1,057	**5,173**	0					**0**						**0%**
31	Save on Energy Process & Systems Upgrades Program				1,221	29,166	28,760	28,010	20,416	15,277	**122,850**	0					**0**	0%					**0%**
32	Save on Energy Monitoring & Targeting Program				0	1,323	503	123	41	20	**2,010**	0					**0**						**0%**
33	Save on Energy Energy Manager Program				90	3,581	3,673	3,816	3,816	3,673	**18,649**	0					**0**	0%					**0%**
Sub-total - Business Province-Wide Program					**11,616**	**138,061**	**142,702**	**125,347**	**115,953**	**109,769**	**643,448**	**2,863**					**2,863**	**25%**					**0%**
Local & Regional Program																							
34	Business Refrigeration Local Program				0	333	755	94	114	84	**1,380**	n/a					**0**	n/a					**0%**
35	First Nation Conservation Local Program				0	131	175	175	175	131	**787**	n/a					**0**	n/a					**0%**
36	Social Benchmarking Local Program				0	7,426	9,895	10,316	11,613	11,925	**51,175**	n/a					**0**	n/a					**0%**
Sub-total - Local & Regional Program					**0**	**7,890**	**10,825**	**10,585**	**11,902**	**12,140**	**53,342**	**0**					**0**						**0%**
Pilot Program																							
37	Enersource Hydro Mississauga Inc. - Performance-Based Conservation Pilot Progra											n/a					**0**						
38	EnWin Utilities Ltd. - Building Optimization Pilot											n/a					**0**						
39	EnWin Utilities Ltd. - Re-Invest Pilot											n/a					**0**						
40	Horizon Utilities Corporation - ECM Furnace Motor Pilot											n/a					**0**						
41	Horizon Utilities Corporation - Social Benchmarking Pilot											n/a					**0**						
42	Hydro Ottawa Limited - Conservation Voltage Regulation (CVR) Leveraging AMI Da											n/a					**0**						
43	Hydro Ottawa Limited - Residential Demand Response Wi-Fi Thermostat Pilot											n/a					**0**						
44	Kitchener-Wilmot Hydro Inc. - Pilot - DCKV											n/a					**0**						
45	Niagara-on-the-Lake Hydro Inc. - Direct Install Energy Efficiency Measures for the											n/a					**0**						
46	Oakville Hydro Electricity Distribution Inc. - Direct Install - Hydronic											n/a					**0**						
47	Oakville Hydro Electricity Distribution Inc. - Direct Install - RTU Controls											n/a					**0**						
48	Toronto Hydro-Electric System Limited - Direct Install - Hydronic (Pilot Savings)											n/a					**0**						
49	Toronto Hydro-Electric System Limited - Direct Install - RTU Controls (Pilot Savings											n/a					**0**						
50	Toronto Hydro-Electric System Limited - PFP - Large (Pilot Savings)											n/a					**0**						
Sub-total - Pilot Program												**0**					**0**						
Other																							
51	Adjustments to 2015 CFF Verified Results											n/a					**0**						
52	Adjustments to 2016 CFF Verified Results											n/a					**0**						
53	Adjustments to 2017 CFF Verified Results											n/a					**0**						
54	Adjustments to 2018 CFF Verified Results											n/a					**0**						
55	Adjustments to 2019 CFF Verified Results											n/a					**0**						
Sub-total - Other												**0**					**0**						
Sub-total - 2015-2020 Conservation First Framework					**14,238**	**175,789**	**178,936**	**159,196**	**150,818**	**144,456**	**823,433**	**10,423**					**10,423**	**73%**					**1%**
Total					**189,972**	**175,789**	**178,936**	**159,196**	**150,818**	**144,456**	**999,167**	**190,407**					**190,407**	**100%**					**19%**

Source: IESO Final 2015 Annual Verified Results Report – Hydro One Networks, Provincial-Wide Progress Tab

TAB 9

Energy Prices

Industrial Energy Prices (in dollar per eGWH)

Year	Electricity	Natural Gas	Oil	Coal
1961	25,407.6	10,715.0	12,387.7	2,865.7
1962	25,618.6	10,202.9	8,843.2	2,826.4
1963	25,829.6	10,221.7	8,741.1	2,787.2
1964	25,820.8	10,226.9	8,676.5	2,747.9
1965	26,190.4	10,158.8	8,289.4	3,650.8
1966	26,027.2	10,496.1	7,697.6	4,004.1
1967	26,558.1	9,624.8	7,675.0	4,082.6
1968	27,100.6	9,092.3	7,340.6	4,121.8
1969	29,149.6	8,700.7	6,911.8	2,669.4
1970	30,791.4	8,114.1	6,539.2	3,179.7
1971	32,639.8	8,185.4	8,658.2	3,219.0
1972	31,933.9	7,803.1	8,691.7	3,415.2
1973	32,281.8	7,626.3	8,437.8	3,493.8
1974	31,591.6	8,064.1	11,189.4	7,026.8
1975	33,191.0	10,451.8	16,029.6	9,696.2
1976	37,477.2	14,521.3	15,656.5	9,931.7
1977	45,954.8	15,640.5	17,566.1	9,931.7
1978	43,585.9	17,097.2	19,351.0	10,834.6
1979	43,601.7	17,069.5	17,753.2	7,262.3
1980	45,183.1	17,754.5	17,863.0	10,442.0
1981	44,153.5	20,202.9	20,955.1	10,873.8
1982	45,512.8	22,531.0	20,972.4	10,795.3
1983	45,193.3	23,761.5	21,543.3	9,853.2
1984	45,756.3	22,651.6	22,492.9	10,010.2
1985	47,807.3	21,613.8	22,546.4	10,010.2
1986	47,478.3	20,054.4	13,960.9	9,421.4
1987	47,699.3	17,034.8	13,441.7	8,636.3
1988	48,021.3	14,981.9	11,113.5	8,247.6
1989	47,752.7	12,969.8	10,990.6	6,205.3
1990	48,385.2	12,268.3	13,921.1	8,000.8
1991	50,199.0	12,341.9	11,784.6	7,383.7
1992	54,501.5	12,710.4	12,388.3	6,945.5
1993	53,615.6	12,931.4	12,257.1	7,070.6
1994	53,878.1	14,552.4	12,897.5	6,413.6
1995	52,598.4	13,005.1	13,354.2	6,163.3
1996	51,843.7	12,378.8	17,044.4	6,100.7
1997	50,760.9	13,926.1	15,306.9	5,881.7
1998	50,760.9	15,068.2	12,419.8	6,100.7
1999	50,531.2	17,941.9	15,207.2	6,132.0
2000	49,557.5	23,259.4	22,873.7	5,830.6
2001	51,878.1	25,505.3	19,812.0	6,330.5
2002	54,572.9	29,236.3	20,045.0	6,514.0
2003	53,479.6	35,444.4	20,905.3	5,972.3
2004	45,768.1	34,435.2	25,919.1	5,896.2
2005	52,301.5	35,933.7	31,033.2	6,169.3
2006	46,290.8	39,450.7	34,365.6	5,842.5
2007	42,532.3	38,441.5	34,870.5	6,357.3
2008	42,492.9	34,588.1	47,445.3	6,003.6
2009	48,336.4	35,138.6	31,035.7	4,530.7
2010	47,048.4	32,875.5	33,963.7	4,942.6
2011	47,206.7	31,835.8	40,630.9	5,036.6
2012	46,962.2	32,936.7	39,418.1	5,412.7
2013	52,892.9	35,386.3	38,790.6	4,984.2
2014	56,962.5	36,310.3	37,085.8	5,015.7
2015	60,750.3	23,052.5	21,982.2	5,558.9
2016	61,189.6	23,471.1	15,503.5	6,103.2
2017	61,819.8	25,080.9	19,052.0	5,509.4
2018	62,411.9	24,865.2	20,914.7	4,886.6

Residential Energy Prices (in dollar per eGWH)

Year	Electricity	Natural Gas	Oil
1961	49,569.4	21,234.8	16,432.1
1962	48,981.6	20,983.0	16,237.3
1963	48,162.8	20,307.3	15,754.1
1964	47,311.2	19,788.7	16,640.4
1965	46,157.3	19,306.0	16,599.8
1966	44,510.4	18,316.9	15,655.3
1967	43,343.9	17,825.3	15,753.5
1968	43,504.8	16,861.0	15,910.4
1969	43,030.7	16,135.0	15,990.0
1970	43,307.5	15,604.4	15,464.2
1971	44,102.7	15,179.4	15,697.1
1972	45,180.1	14,470.3	15,712.0
1973	44,821.5	13,645.2	16,483.8
1974	42,894.2	13,240.2	18,564.6
1975	43,027.0	15,041.1	19,132.2
1976	46,615.8	18,189.2	20,854.1
1977	53,849.9	20,135.3	22,378.9
1978	52,461.9	21,219.3	23,625.8
1979	52,112.2	21,446.9	24,083.4
1980	53,198.2	22,076.9	26,272.8
1981	52,089.3	24,242.8	33,899.9
1982	51,747.2	25,718.6	37,428.4
1983	52,547.9	28,040.9	38,886.3
1984	53,622.6	27,034.9	39,592.4
1985	55,229.1	26,136.8	41,619.1
1986	54,839.5	24,779.5	33,339.5
1987	55,081.8	23,285.4	30,748.3
1988	55,201.6	22,027.0	30,947.8
1989	54,621.1	18,920.5	28,261.2
1990	55,576.7	18,350.4	30,573.8
1991	61,832.6	19,319.8	32,700.7
1992	68,331.4	19,386.6	31,238.4
1993	77,908.4	19,754.3	32,634.2
1994	76,351.4	21,091.3	32,866.8
1995	78,995.3	20,021.7	32,900.1
1996	75,881.4	19,654.0	34,894.0
1997	76,087.0	20,823.9	37,320.0
1998	76,087.0	22,495.2	35,425.7
1999	75,749.2	25,436.6	36,954.4
2000	73,626.6	33,912.0	44,249.5
2001	75,775.2	44,160.3	34,160.0
2002	78,053.2	39,392.8	27,645.8
2003	75,900.3	45,413.3	34,909.0
2004	74,498.5	50,303.0	33,933.0
2005	80,706.7	61,854.9	35,703.4
2006	80,706.7	65,583.4	36,906.4
2007	74,498.5	69,586.8	35,703.4
2008	74,498.5	76,698.7	34,455.1
2009	74,498.5	63,000.1	34,999.8
2010	86,914.9	67,138.6	32,435.0
2011	80,706.7	78,099.0	31,368.2
2012	86,914.9	79,003.3	32,253.4
2013	93,123.1	78,618.7	34,461.9
2014	100,754.0	77,035.9	34,791.7
2015	107,851.4	62,443.8	21,984.5
2016	108,740.7	44,822.6	22,281.0
2017	108,648.9	50,178.5	23,629.9
2018	111,591.9	51,198.2	23,267.1

Commercial Energy Prices (in dollar per eGWH)

Year	Electricity	Natural Gas	Oil
1961	29,394.1	18,818.4	11,510.7
1962	29,638.1	18,769.1	14,227.4
1963	29,882.1	17,942.7	13,989.6
1964	29,871.2	17,289.7	13,742.3
1965	30,298.9	16,049.2	13,407.1
1966	30,111.9	14,844.8	12,928.7
1967	30,723.6	14,329.0	12,479.5
1968	31,352.7	13,484.7	11,999.5
1969	33,723.2	12,763.8	11,482.8
1970	35,621.7	11,937.2	11,135.3
1971	36,619.0	11,480.1	11,036.9
1972	36,133.4	10,818.0	11,581.9
1973	38,063.8	10,268.6	11,028.6
1974	36,984.1	10,339.5	11,446.3
1975	37,121.4	12,104.1	12,813.9
1976	39,890.0	15,766.5	13,539.9
1977	46,961.2	16,910.7	14,916.2
1978	44,939.8	18,007.0	15,661.3
1979	44,777.6	18,186.1	16,539.5
1980	45,776.1	18,489.0	16,575.9
1981	44,808.9	20,490.0	18,171.2
1982	44,934.1	22,628.3	23,984.8
1983	45,341.3	24,659.0	26,876.3
1984	46,334.6	23,872.3	27,453.8
1985	47,711.8	22,932.1	29,475.8
1986	47,382.2	21,650.3	20,799.0
1987	47,698.8	20,036.0	17,103.8
1988	47,796.0	18,443.2	16,452.5
1989	47,651.2	16,097.8	16,557.8
1990	48,674.3	15,165.1	18,075.1
1991	50,517.8	15,847.8	17,744.1
1992	55,681.6	16,638.4	17,556.5
1993	58,241.0	16,854.1	18,781.3
1994	59,155.1	18,111.8	18,262.7
1995	58,528.3	17,177.5	18,786.9
1996	59,207.4	16,530.6	22,985.6
1997	58,841.7	17,500.9	21,749.7
1998	58,841.7	18,650.9	16,933.0
1999	58,580.5	21,705.4	19,984.1
2000	56,905.2	30,130.0	33,528.6
2001	55,217.3	30,765.4	28,031.3
2002	60,222.2	27,205.3	28,755.5
2003	57,852.6	35,813.3	30,464.8
2004	47,944.9	34,245.8	10,749.5
2005	53,272.1	34,272.3	11,901.1
2006	53,272.1	34,564.6	11,955.5
2007	53,272.1	33,634.7	12,265.4
2008	47,944.9	33,900.4	13,518.9
2009	53,272.1	34,617.7	11,104.4
2010	53,272.1	32,226.6	11,833.9
2011	58,599.3	31,190.5	13,765.8
2012	63,926.5	32,173.5	13,925.1
2013	69,253.7	34,479.6	13,857.4
2014	74,545.0	34,726.3	13,578.4
2015	77,880.5	21,990.7	11,006.4
2016	79,483.5	22,334.6	7,900.4
2017	81,265.6	23,769.7	8,844.5
2018	83,701.3	23,479.0	9,024.2

TAB 10

Vulnerable Energy Consumers Coalition (VECC) INTERROGATORY #033

Reference:

Exhibit E1/Tab 3/Schedule 1, pages 29-39

Interrogatory:

a) Please provide Hydro One Networks forecast of electricity prices in the residential, commercial and industrial sectors as used in the Annual Econometric Model and describe how they were established.

b) For context please also include the actual prices for 2012-2015 used in the models' estimations.

Response:

a) The forecast of electricity prices in the residential, commercial and industrial sectors as used in the Annual Econometric Model are provided in Exhibit E2, Tab 2, Schedule 1. They were established on the basis of the 2013 LTEP electricity price forecasts for residential and commercial sectors and the NEB electricity price forecast for the industrial sector. (LTEP did not have a forecast for the industrial sector.) The figures are expressed in constant $/eGWh.

b) Actual electricity prices for the years 2012-2015 are also provided in Exhibit E2, Tab 2, Schedule 1.

TAB 11

VECC-47

a) How do actual electricity prices for 2013-2015 compare with those forecast in the 2013 LTEP?

Response:

a) A uniform electricity price for each sector (residential, commercial, and industrial) is not publicly available for the years 2012 to 2015, so it is not possible to make a comparison with the corresponding 2013 LTEP figures.

TAB 12

VECC-45

a) Please explain /clarify what is meant by the following statement:

"Considering there is no incremental peak reduction from existing and further demand response resources over the forecast period, hydro one uses the implicit method to incorporate demand response impacts in load forecasting".

Response:

a) As mentioned in the response to VECC-43, there is no incremental CDM savings due to the DR sources based on the forecast in the 2013 LTEP. In addition to that, there will be substantial changes to how the IESO manages DR programs over next two years and there is no better DR (now called "capacity-based demand response") forecast information from the IESO. Hydro One only added back peak savings, which are attributable to energy efficiency ("EE") and codes and standards ("C&S"), to the actual load for the historical period and deducted forecasted EE and C&S peak savings from the gross peak for the forecast period. The DR impact for the historical period and forecast period is constant, so Hydro One did not add and then deduct the DR impact when calculating its load forecast, as the net effect would have been nil.