
Electricity Prices – Commercial and Industrial

Transition 2018 – Top Issue Briefing Deck

Working Draft

April 2018

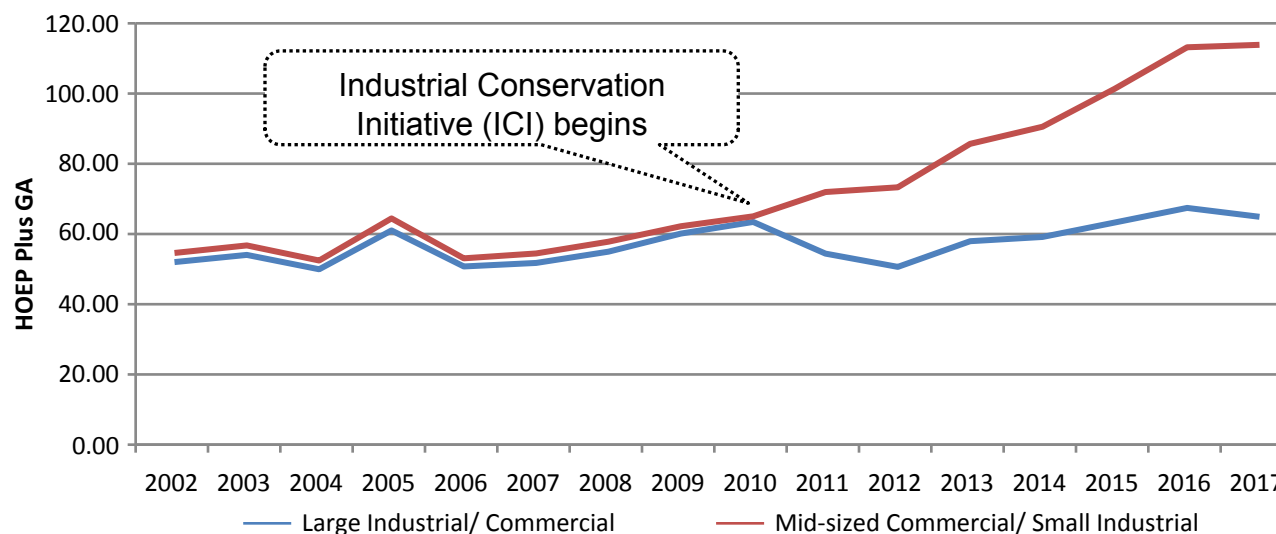
Purpose

- To provide an overview of electricity pricing issues for commercial and industrial consumers, including:
 - Historical, current and forecasts for commercial and industrial electricity bills;
 - Existing electricity rate mitigation programs; and
 - Considerations and Next Steps.

Historic Electricity Prices

- For more than a decade electricity prices in Ontario have increased more than in most other North American jurisdictions and outpaced the overall rate of inflation.
- Similar to residential bills, non-residential electricity prices have increased steadily over the last decade.
 - This long-term increase in electricity prices has been the result of the addition of significant generation capacity, including new natural-gas fired generation, renewables (e.g., wind and solar) and refurbished nuclear, as well as the cost of upgrading and maintaining the province's distribution and transmission infrastructure.

Historical Commodity Cost in Ontario



Note: Above costs do not include delivery, regulatory or debt-retirement (DRC) charges. Large electricity consumers generally pay lower per-unit delivery charges than small and mid-sized consumers.

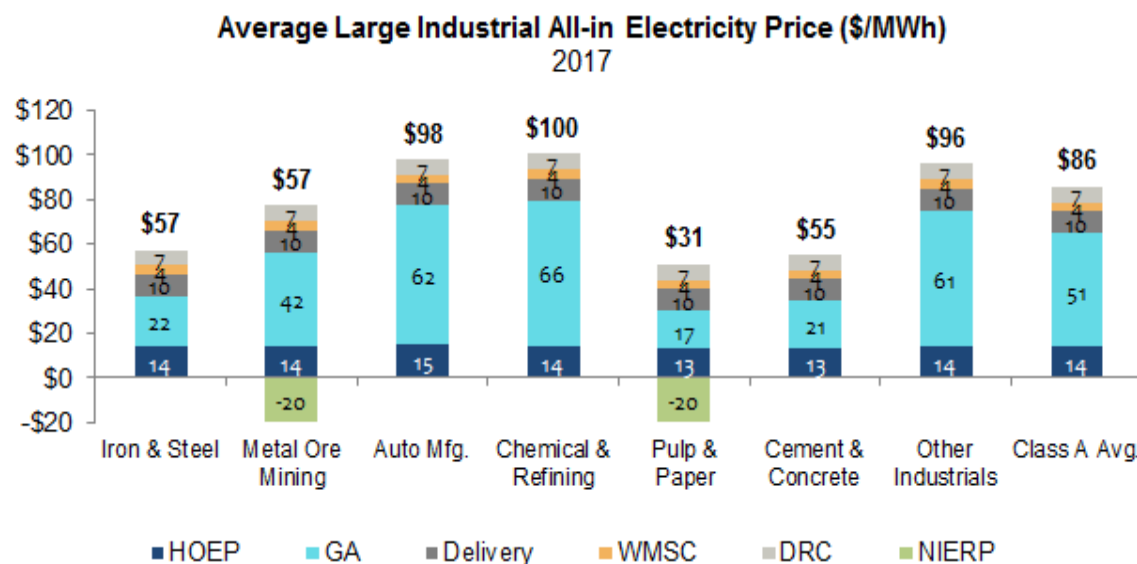
Source: Ministry of Energy

Commercial and Institutional Electricity Consumers

- Commercial and institutional (C&I) electricity consumers are a diverse group. They range from small businesses such as convenience stores and dry cleaners to large shopping malls and large office towers:
 - Regulated Price Plan (RPP) Class B: Small business, commercial and institutional consumers that are eligible for the Ontario Energy Board's (OEB) RPP and Global Adjustment (GA) refinancing: 500,000 consumers (e.g., convenience stores); and
 - Non-RPP Class B: Mid-sized businesses that are not eligible for GA refinancing or the Industrial Conservation Initiative (ICI): 50,000 consumers (e.g., commercial buildings, small manufacturers).
- Commercial electricity consumers are generally embedded within the distribution networks of local distribution companies (LDCs), have a relatively high peak demand profile and much of their electricity consumption is tied to lighting and air conditioning.
- Institutional consumers range from schools, universities and hospitals to municipal buildings such as hockey arenas, as well as military bases and wastewater treatment plants. Demand profiles for institutional consumers are similar to that of commercial consumers, with added variance owing to the wider range of facility types.
- Some commercial (and industrial) consumers sign contracts with electricity retailers for the wholesale market price of electricity. The rates charged by retailers are generally higher than the market rate.

Industrial Electricity Consumers

- Industrial electricity consumers range in size from small to very large and pay different prices on average by sector as a result of their relatively flat demand profile and the way that GA costs are recovered.
 - Class A: Large commercial businesses that are eligible for ICI: 1,100 consumers (e.g.. smelters, heavy manufacturers, large shopping malls).
 - Many industrial electricity consumers are large enough to be eligible for ICI (i.e., a monthly maximum peak demand of 500 kilowatts (kW) or more).
- Approximately 60 of the largest industrial electricity consumers in Ontario are directly connected to the high-voltage grid, representing 108 facilities. These 60 consumers are responsible for about half of industrial sector electricity consumption. Remaining industrial consumers (~20,000) are embedded in the networks of local distribution companies throughout the province.
- As shown in the chart, amongst transmission-connected industrial sectors, pulp and paper paid the lowest price on average in 2017 while the chemistry sector paid the highest. This is primarily due to the nature of their operations.



Source: Independent Electricity System Operator (IESO), Ministry of Energy, Ministry of Northern Development and Mines

Current non-RPP Class B and Class A Electricity Prices

- The table below shows the components of a typical non-RPP Class B (i.e., commercial and institutional) and Class A (i.e., industrial) electricity bill for 2017.

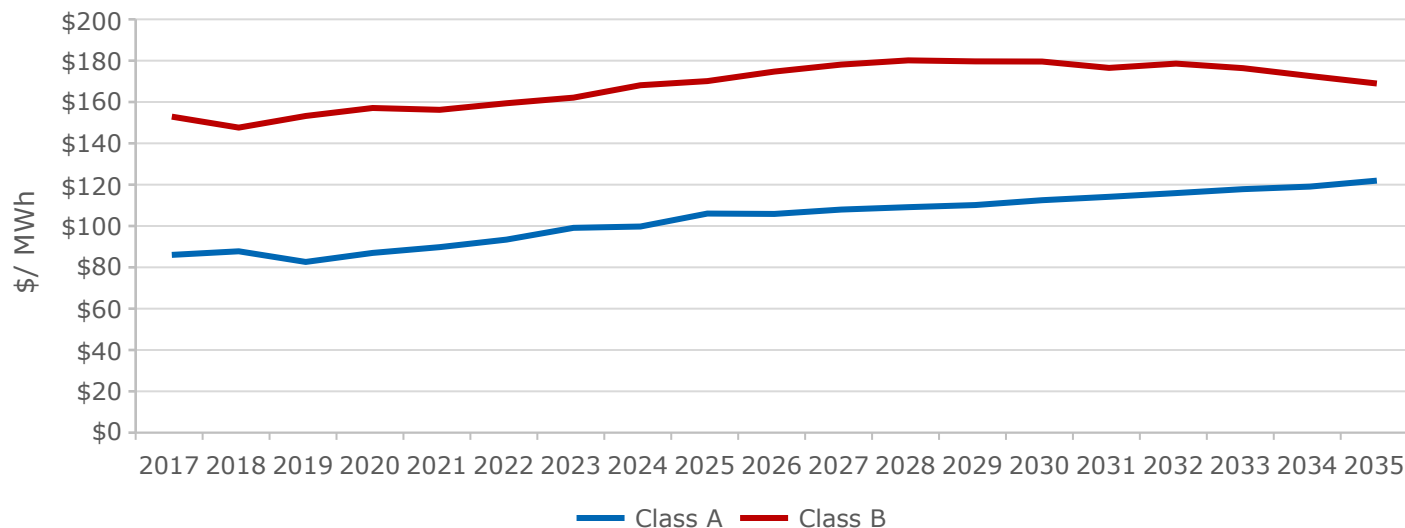
Bill Components	Non-RPP Class B Price (\$/MWh)	Class A Price (\$/MWh)	Notes
Electricity	\$16	\$14	Covers the cost of generating electricity and conservation and demand management programs. Consumers with contracts with electricity retailers may pay a different rate than that listed
Global Adjustment	\$100	\$51	Global Adjustment (GA) mechanism ensures recovery of long-term generation and conservation cost
Distribution	\$18	-	Associated with the cost of delivering electricity from distributors to customers
Transmission	\$11	\$10	Associated with the cost of delivering electricity from generators to distributors
Regulatory	\$4	\$4	Recovers the costs of administering the wholesale electricity system and maintaining the reliability of the provincial grid
HST	\$19	-	Applied at a rate of 13 per cent; consists of a provincial portion of 8 per cent and a federal portion of 5 per cent
Total	\$168	\$79	

Note: Although Debt Retirement Charge (DRC) was in effect for non-residential consumers during all of 2017, it is not shown in the table in order to more accurately reflect current conditions. Many industrial electricity consumers do not pay HST, as they receive tax credits equal to HST expenditures on electricity.

Long-Term Electricity Price Outlook

- Class A consumers' electricity prices are expected to increase at roughly the rate of inflation over the planning horizon. Non-RPP Class B rates are expected to decrease in real terms, starting at a higher level than Class A.

Forecasted All-in Electricity Prices



Note: The above costs do not include delivery, regulatory, or debt-retirement charges. Generally speaking Class A consumers pay lower per-unit delivery charges.

Current Rate Mitigation Activities

Industrial Conservation Initiative

- Under the Industrial Conservation Initiative (ICI) participants achieve lower rates by reducing demand during peak periods. The better a consumer's ability to reduce demand in the highest demand hours of the year, the lower their global adjustment (GA) charges.
- A number of Class A-eligible electricity consumers find it challenging to reduce demand in the peak hours, as a result of some aspect of their manufacturing process or strict production schedules (e.g., auto). These consumers either chose not to participate in ICI, or participate in ICI and pay GA charges that are above the Class A average.
- ICI provides an electricity system benefit by reducing Ontario peak demand, which reduces the need for additional generation in the longer term.
- The table contrasts the price paid in 2017 by a distribution-connected ICI participant (i.e., paying average Class A GA) with the price paid by a non-ICI participant. Note: Prices are illustrative.

Components	ICI Participant	Non-ICI Participant
Electricity	14.14	14.14
Global Adjustment	50.76	99.74
Transmission	7.25	7.25
Distribution	10.24	10.24
Regulatory	4.88	4.88
Total	87.27	134.25

Note: Prices reflect a two megawatt consumer located in Toronto with an 85 per cent load factor. Distribution rates exclude rate riders. GA for the ICI participant reflects average Class A. Although DRC was in effect for non-residential consumers during all of 2017, it is not shown in the table in order to more accurately reflect current conditions.

Source: IESO, Ontario Energy Board (OEB)

Current Rate Mitigation Activities (cont'd)

Additional Programs / Actions

- As of April 2018, the Debt Retirement Charge (DRC) no longer applies and does not appear on electricity bills. The result has been a saving for all non-residential consumers of \$7/MWh (or about 8 per cent of a typical Class A consumer's bill and about 4 per cent of a typical non-RPP Class B consumer's bill).
- Industrial Electricity Incentive (IEI):
 - The IEI program offered reduced electricity rates for companies starting or expanding operations in Ontario. The IESO awarded 22 contracts to energy-intensive companies across the province through the program. The program was designed to optimize surplus electricity in system.
 - No further intakes to the program are currently planned as the amount of surplus electricity is expected to decrease over the coming years (see Appendix for 2017 LTEP Supply and Demand Forecast).
- Northern Industrial Electricity Rate Program (NIERP):
 - This economic development program is funded by Ministry of Northern Development and Mines and administered by the IESO . Currently, the NIERP is fully subscribed (i.e., with 19 participants representing 26 facilities at an annual cost of \$120 million). Note: This program is funded through the provincial tax-base.
 - Participants in the NIERP receive a rebate of two cents per kilowatt hour. On average, industrial electricity prices can be reduced by over 20 per cent through the program.
 - Eligible facilities must be located in northern Ontario, classified as mining or manufacturing operations, and consume a minimum of 50,000 megawatt hours (MWh) of electricity per year.

Current Rate Mitigation Activities (cont'd)

Additional Programs / Actions

- Electricity Conservation and Demand Management (CDM) Programs:
 - Ontario has a suite of CDM programs in place that help businesses, including municipal, commercial and industrial customers, manage their electricity bills through the installation of energy saving measures and energy management and training services.
 - Programs are delivered by IESO and local distribution companies (LDCs). These rate-based programs are funded through the Global Adjustment. All business programs must pass required cost-effectiveness tests showing that the avoided system costs (benefits) outweigh program delivery costs.
- Ontario is partnering with the Ontario Chamber of Commerce (OCC) and Canadian Manufacturers and Exporters (CME) to deliver targeted outreach to the business community throughout the province to enhance energy literacy and awareness (e.g., energy programs to lower electricity prices).
 - OCC has number of Know Your Power events scheduled in the coming months.
 - CME launched the Energy Management Assistance Program (EMAP) in March 2018.

Considerations

Industrial Competitiveness

- Many industrial electricity consumers in Ontario, particularly those that are large to very large, have parent companies that are multinational corporations with operations in several countries. In this context, electricity prices often play a role in investment and capital allocation decisions for these corporations.
- Small and medium sized enterprises (SMEs) also require competitive prices. For these companies, electricity prices impact profitability and employment levels and influence business decisions such as relocation and expansion.
- Quebec and the US Great Lakes states have historically competed with Ontario for investment and business retention. The table below shows published electricity prices in Canadian cents for these key jurisdictions, along with the Canadian and U.S. averages.

Illustrative All-In Electricity Prices – Canadian \$/MWh (April 2017)

<i>2017</i>	Commercial / Small Industrial	Large Industrial
Ontario – South	132.40	85.60
Ontario – North	132.40	65.60
Quebec	79.70	49.10
Michigan	144.90	97.50
Ohio	137.20	88.10
New York	184.70	75.40
U.S. average	147.50	88.10

Note: Ontario – North price reflects the \$20/MWh rebate provided by the NIERP.

Source: U.S. Energy Information Administration (EIA), Hydro Quebec, Ministry of Energy

Considerations (cont'd)

Further Rate Mitigation

- Due to the current large portion of fixed electricity system costs, it is difficult to reduce costs for any particular consumer class without increasing cost for other consumers over the near term.
 - For example, increased support for energy efficiency and on-site generation, where cost-effective would lead to cost reductions for program participants and longer term system savings, but could increase costs for non-participating consumers in the near term.
- Further expansion of ICI is an option to reduce costs for small commercial and industrial consumers that are not currently eligible (i.e., Class B consumers).
 - Further expansion of ICI or increased peak avoidance by participants can, however, lead to higher costs on other electricity consumers (i.e., consumers that remain in Class B).
- Options to reduce rates for all non-residential consumers include:
 - In the short term: Further tax-based economic development programs.
 - Over the long term: Reducing total system costs (see Sector Efficiencies Top Issues deck).

Considerations (cont'd)

Jurisdictional Comparison

- Although comparing Ontario electricity prices with U.S. state prices can be useful, it has limitations. There is no such thing as a single “Ontario price” or a “Michigan price”, for the following reasons:
 - Programs and Economic Development Riders: Programs such as economic development riders in the U.S. can mean that new customers and those that have expanded pay a different price than others. In the U.S., the relevant discount may not be constant from year to year.
 - Global Adjustment: U.S. states don't have a recovery mechanism equivalent to GA. In Ontario, GA charges can vary greatly, as each large consumer pays GA charges according to their contribution to peak demand in the five highest demand hours.
 - Consumption Profiles: In the U.S. and Canada, annual demand charges are often determined by peak, meaning company-specific load profiles can cause actual prices to diverge from published prices.
 - Location: Most jurisdictions, including Ontario, have more than one utility, each with a different geographic service territory and rate schedule. This means the published price used for price comparison purposes (an average) differs from prices actually paid by most consumers.
 - Connection Type: In all jurisdictions, consumers that are directly connected to the transmission grid pay less than those that are connected to the (lower voltage) distribution grid. Among distribution-connected consumers, those that are connected at primary voltage may pay a different price than those that are connected at secondary voltage.
 - Transformers and Lines: In both Ontario and the U.S., consumers generally pay less if they own the transformer and/or lines. As a result, the published price employed in the price comparison may not be reflective of the actual price paid by individual companies/consumers.

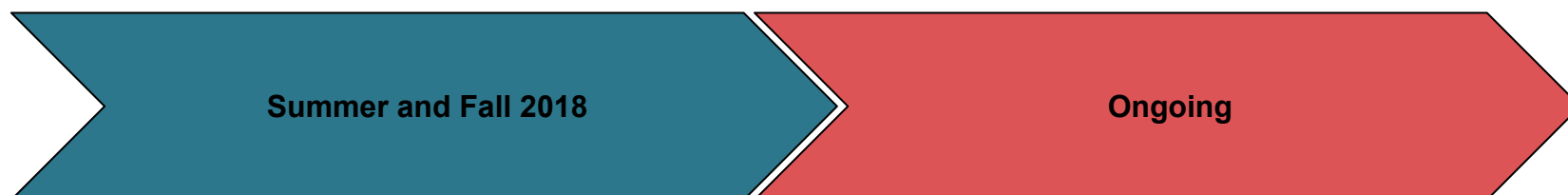
Considerations (cont'd)

Cost Allocation and Rate Design / Class B Rate Design

- In its *Regulated Price Plan (RPP) Roadmap* report, the Ontario Energy Board (OEB) referenced the potential to use a similar cost allocation to TOU for non-RPP Class B consumers.
 - OEB staff are currently studying the potential impact of “shaping” GA charges for non-RPP Class B consumers, with an estimated completion date of mid-2018.
 - Electricity costs would change for non-RPP Class B consumers if GA costs varied according to time of use. Among these consumers, those with an inability to shift consumption out of peak hours (e.g., most retail) would pay higher prices compared to the status quo.
- Currently, the total GA cost to be recovered is split between Class A consumers and Class B consumer groups based on the contribution of each group to system peak. The responsibility for the allocation of GA costs is prescribed by *Ontario Regulation 429/04*.
 - Within Class B, GA is divided between the RPP (residential and small business consumers) and non-RPP (all other consumers) sub-groups based on volume of consumption.
 - For non-RPP consumers the GA cost is the same regardless of the time that a customer consumes electricity. This is different than the GA paid by individual RPP customers through TOU prices, since the price design of TOU allocates some system costs into different time periods.
 - The result is that the price signal for non-RPP consumers provided by GA is not as strong as it would be if it varied by time of use.

Key Near-Term Government Decisions

- Government decisions that may materialize over the near-term include:



- An OEB staff report to be published in mid-2018 that considers shaping GA for non-RPP Class B consumers may require Ministry action.
- Further education sessions will be conducted by the Ontario Chamber of Commerce and the Canadian Manufacturers & Exporters.
- The Ministry will perform ongoing analysis on the impact of the ICI program on ratepayers.

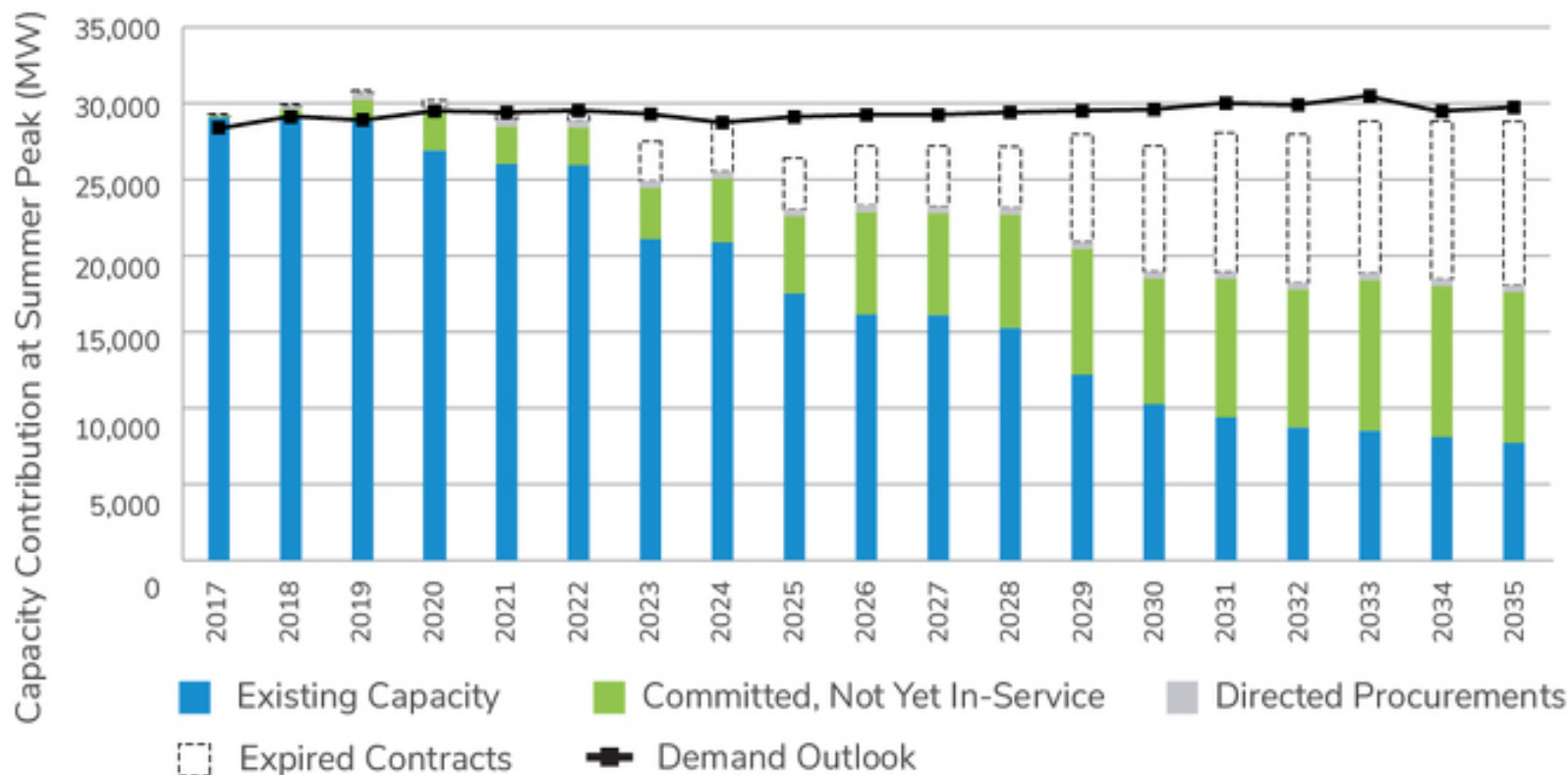
Next Steps

- Ongoing Ministry monitoring of the effectiveness of the ICI program, the recent expansion and its implication on consumers.
- Ongoing Ministry monitoring of the OCC and the CME's outreach campaigns to raise awareness of energy conservation and cost-saving programs available to the business community.
- Ministry review the OEB staff paper on shaping GA charges for non-RPP Class B consumers in mid-2018.

Appendix

Supply and Demand Outlook (2017 – 2035)

- While there is currently an adequate supply of electricity, a shortfall in capacity is expected beginning in the early-to-mid 2020s as the Pickering Nuclear Generating Station reaches its end of life, and nuclear units at Darlington and Bruce are temporarily removed from service for refurbishment.



Source: 2017 LTEP, IESO

Jurisdictional Comparison – Commercial

- The following chart compares commercial electricity prices across North American cities.

2017 Commercial Electricity Prices (Canadian ¢/kWh)							
Jurisdiction	Cost	Jurisdiction	Cost	Jurisdiction	Cost	Jurisdiction	Cost
1 Manitoba	6.58	18 Nebraska	11.68	35 New Mexico	13.36	52 District of Columbia	15.99
2 Newfoundland	7.89	19 New Brunswick	11.88	36 Georgia	13.44	53 Maine	16.32
3 Quebec	7.97	20 Louisiana	11.89	37 Montana	13.69	54 New Jersey	16.40
4 British Columbia	8.72	21 Oregon	11.91	38 Arizona	13.71	55 New York	18.47
5 Alberta	8.95	22 Iowa	12.01	39 Ohio	13.72	56 California	18.68
6 Canadian Average	10.45	23 Illinois	12.15	40 Tennessee	13.76	57 New Hampshire	19.40
7 Virginia	10.53	24 North Dakota	12.22	41 Indiana	13.95	58 Vermont	19.72
8 Idaho	10.71	25 Pennsylvania	12.23	42 Mississippi	14.03	59 New England	20.05
9 Nevada	10.75	26 Nova Scotia	12.77	43 South Carolina	14.04	60 Massachusetts	20.13
10 Oklahoma	10.77	27 Florida	12.80	44 Kansas	14.11	61 Rhode Island	20.60
11 North Carolina	10.99	28 South Dakota	12.92	45 Minnesota	14.19	62 Connecticut	21.19
12 Washington	11.22	29 Colorado	12.92	46 Michigan	14.49	63 Alaska	27.27
13 Texas	11.28	30 Kentucky	13.08	47 Wisconsin	14.54	64 Hawaii	35.46
14 Utah	11.34	31 Ontario	13.24	48 Prince Edward Island	14.56		
15 Arkansas	11.39	32 Wyoming	13.32	49 U.S. Average	14.75		
16 Missouri	11.46	33 West Virginia	13.32	50 Maryland	14.83		
17 Saskatchewan	11.60	34 Delaware	13.34	51 Alabama	15.33		

Note: Estimates may differ from actual costs to a consumer based on location, connection and operation characteristics. Prices exclude taxes and participation in any applicable jurisdictional benefit programs.

The Ontario industrial price is based on April 2017 data and includes the Hourly Ontario Energy Price, Class B Global Adjustment, delivery, wholesale market service charges and the Debt Retirement Charge.

All other Canadian prices are from the Hydro Quebec Rate Comparison for rates effective April 1, 2017 for select local distribution companies servicing specific cities and reflects a 1 MW consumer with a 56 per cent load factor. Where Hydro Quebec reports prices for two cities in a province (e.g. Calgary and Edmonton), an average of the two is used. In provinces where only one city is reported (e.g. Vancouver in BC, Montreal in QC), that one price is used to represent the province for indicative comparison purposes.

American jurisdictions reflect April 2017 data from the US Energy Information Administration's survey of approximately 500 of the largest utilities. The price reflects the average revenue reported by the utility from electricity sold to the commercial. The value represents an estimated average retail price, but does not necessarily reflect the price charged to an individual consumer. National averages are the simple averages of the jurisdictions in the country. Prices are converted at an exchange rate of 1 USD = 1.33 CAD.

Source: EIA, Hydro Quebec, Ministry of Energy

Jurisdictional Comparison – Industrial (cont'd)

- The following chart compares industrial electricity prices across North American cities.

2017 Industrial Electricity Prices (Canadian ¢/kWh)					
Jurisdiction	Cost	Jurisdiction	Cost	Jurisdiction	Cost
1 Manitoba	4.32	18 Kentucky	7.44	35 Ohio	8.81
2 Newfoundland	4.90	19 New Brunswick	7.50	36 U.S. Average	8.81
3 Quebec	4.91	20 New York	7.54	37 West Virginia	8.99
4 Alberta	5.67	21 Utah	7.57	38 Pennsylvania	9.19
5 Washington	6.08	22 Idaho	7.77	39 Wyoming	9.26
6 British Columbia	6.29	23 South Carolina	7.82	40 Prince Edward Island	9.31
7 Montana	6.41	24 Arizona	7.85	41 Colorado	9.43
8 Ontario - North	6.56	25 North Carolina	7.92	42 Michigan	9.75
9 Nevada	6.68	26 Tennessee	7.93	43 Indiana	9.83
10 Louisiana	6.69	27 Alabama	7.97	44 Kansas	9.89
11 Oklahoma	6.87	28 Oregon	8.01	45 Nebraska	9.91
12 Canadian Average	6.89	29 New Mexico	8.02	46 Minnesota	10.04
13 Texas	7.11	30 Mississippi	8.09	47 Nova Scotia	10.14
14 Iowa	7.19	31 Missouri	8.45	48 Wisconsin	10.15
15 Saskatchewan	7.30	32 Illinois	8.55	49 South Dakota	10.17
16 Arkansas	7.4	33 Ontario - South	8.56	50 Florida	10.51
17 Georgia	7.41	34 Virginia	8.63	51 Delaware	10.59
				52 North Dakota	11.41
				53 Maryland	11.48
				54 Maine	12.58
				55 New Jersey	13.12
				56 Vermont	13.44
				57 California	14.13
				58 New Hampshire	16.51
				59 Connecticut	17.52
				60 Massachusetts	17.81
				61 Rhode Island	18.95
				62 Alaska	22.42
				63 Hawaii	29.87

Note: Estimates may differ from actual costs to a consumer based on location, connection and operation characteristics. Prices exclude taxes and participation in any applicable jurisdictional benefit programs, excluding Ontario - North price which reflects the \$20/MWh provided by the NIERP program.

The Ontario industrial price is based on the average all-in price for year-to-date May 2017 and includes the Hourly Ontario Energy Price, Class A Global Adjustment, delivery, wholesale market service charges and the Debt Retirement Charge.

All other Canadian prices (except Ontario) are from the Hydro Quebec Rate Comparison for rates effective April 1, 2017 for select local distribution companies servicing specific cities. Where Hydro Quebec reports prices for two cities in a province (e.g. Calgary and Edmonton), an average of the two is used. In provinces where only one city is reported (e.g. Vancouver in BC, Montreal in QC), that one price is used to represent the province for indicative comparison purposes. In the Hydro Quebec Rate Comparison, a large consumer reflects 5 MW with monthly consumption of 3,060 MWh.

American jurisdictions reflect April 2017 data from the US Energy Information Administration's survey of approximately 500 of the largest utilities. The price reflects the average revenue reported by the utility from electricity sold to the industrial sector. The value represents an estimated average retail price, but does not necessarily reflect the price charged to an individual consumer. National averages are the simple averages of the jurisdictions in the country. Prices are converted at an exchange rate of 1 USD = 1.33 CAD.

Source: EIA, Hydro Quebec, Ministry of Energy