

Electricity Prices and Rate Mitigation

Transition 2018

Top Issue Briefing Deck

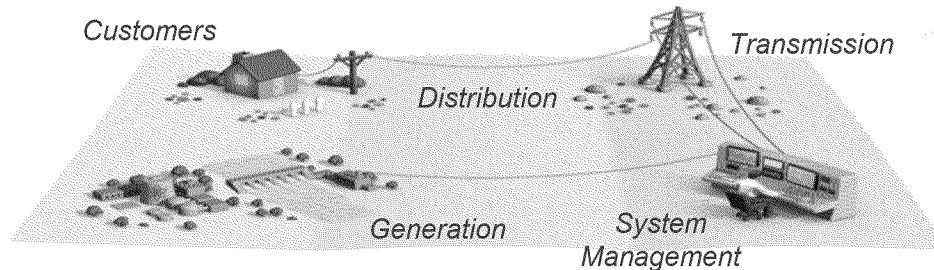
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Purpose

- To provide an overview of electricity prices and current pricing issues in Ontario, including:
 - Background on the current cost of electricity service and electricity prices by consumer class;
 - Recent cost mitigation / efficiency measures; and
 - Considerations for potential future efficiency and rate mitigation measures.

Cost of Electricity Service

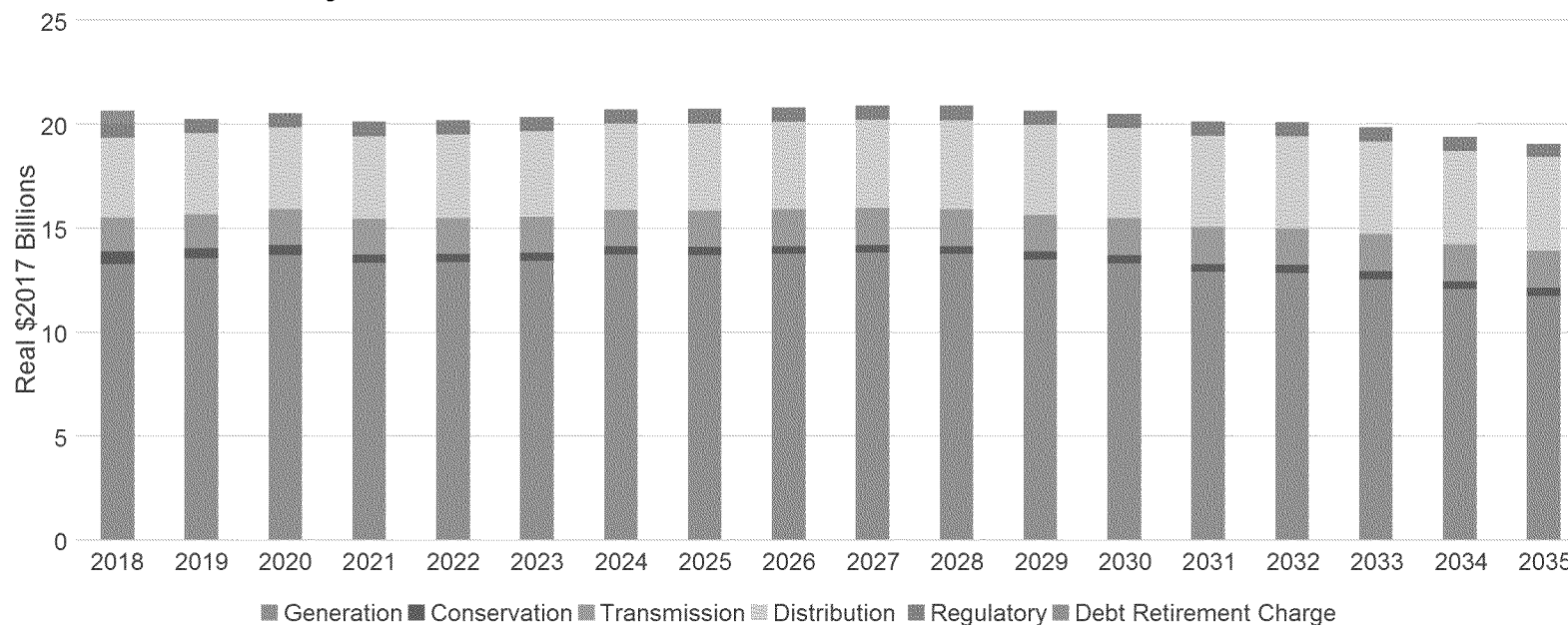
- The cost of providing electricity service is made up of the following:
 - **Generation:** The capital cost, fuel cost and operating cost of various forms of generation, such as nuclear, natural gas, hydroelectric, wind, solar and biomass.
 - **Conservation:** Programs undertaken by Independent Electricity System Operator (IESO) and Local Distribution Companies (LDCs) are recovered from customers as part of the commodity (generating) cost.
 - **Distribution:** The costs associated with building, operating and maintaining/managing the infrastructure to move electricity from the transmission system to the customer point-of-use, as well as customer billing and inquiry. Distribution rates are approved by the Ontario Energy Board (OEB).
 - **Transmission:** The costs of transmitters, such as Hydro One, to operate and maintain the high-voltage transmission system that carries electricity from generating stations to LDCs and large customers.
 - **Regulatory Charges:** The administrative cost of operating Ontario's electricity system, including the cost of running IESO.



Cost of Electricity Service (cont'd)

- In 2017, the total cost of running the electricity system was about \$21 billion. Under the 2017 Long-Term Energy Plan (2017 LTEP), the cost of electricity service is expected to remain relatively flat in real terms, (i.e., removing inflationary impacts) as shown in the below figure.
- The Debt Retirement Charge (DRC) was removed from residential users' electricity bills in January 2016 and from all other electricity consumers as of April 1, 2018.

Cost of Electricity Service



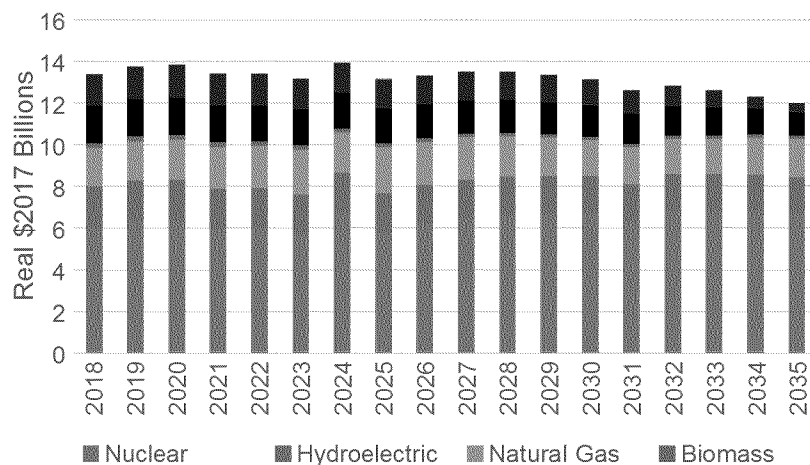
Source: IESO, 2017 Long-Term Energy Plan (2017 LTEP)

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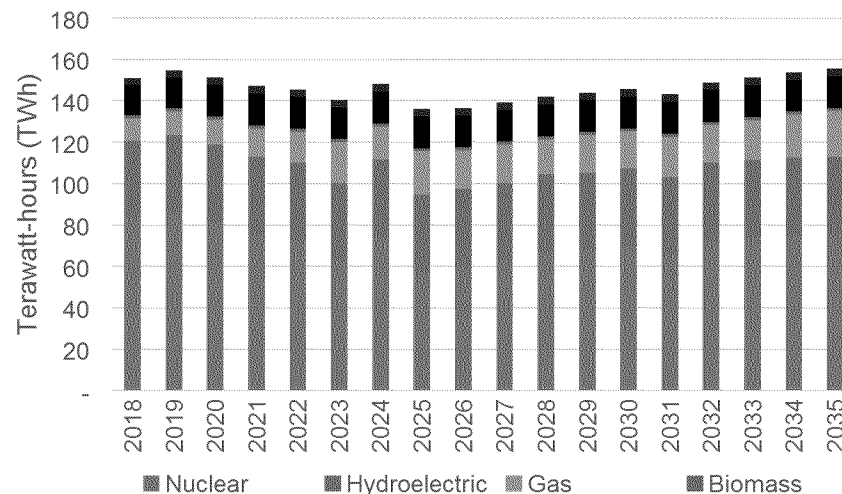
Cost of Electricity Service (cont'd)

- Electricity generation represents the largest portion of the total cost of electricity service. Nearly all of Ontario electricity generation is either contracted with IESO or regulated by the OEB.
 - Contracted and regulated generation help ensure that Ontario has sufficient capacity and energy to meet North American reliability requirements.
- Total cost and total generation by fuel type are shown below.

Generation Cost by Fuel Type



Generation by Fuel Type



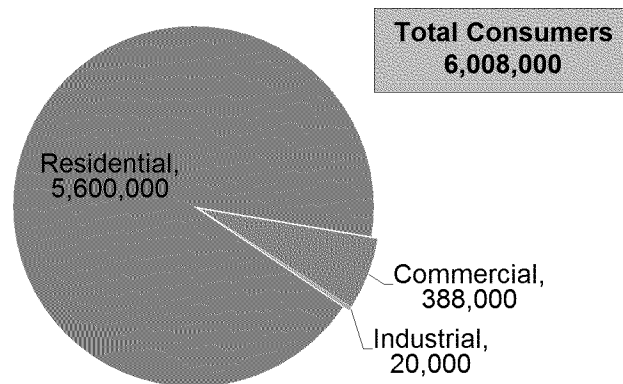
Source: IESO, 2017 LTEP

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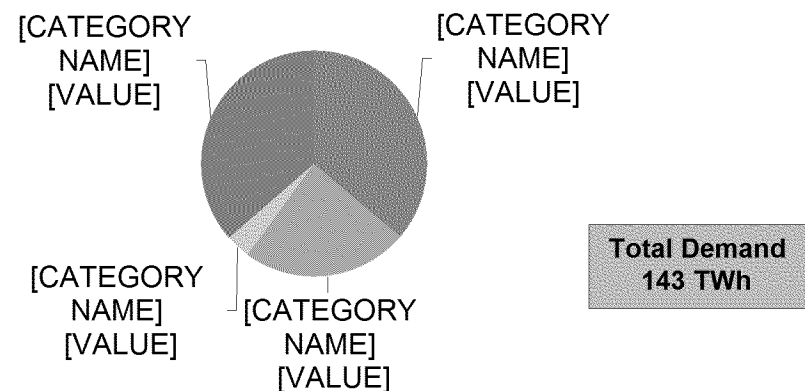
Electricity Consumers by Sector

- Ontario has roughly 5.6 million residential consumers, who are together responsible for just over one-third of the total electricity consumption in the province.
- There are nearly 400,000 commercial consumers, who consume a roughly equal amount as residential consumers.
- Ontario's ~20,000 industrial consumers represent about one-quarter of total electricity demand. This share has been reduced in recent years due to changing economic conditions (i.e., primarily in the resource and manufacturing sectors).

Electricity Consumers by Sector



Electricity Demand by Sector (TWh)



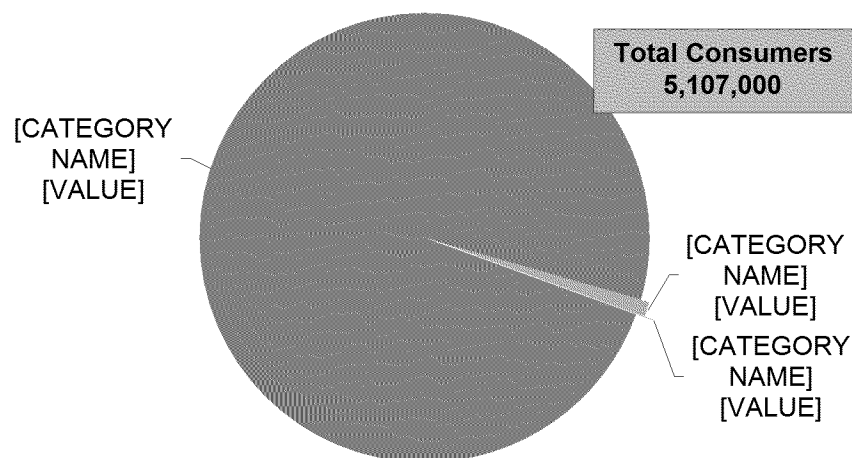
Note: The number of residential consumers is based on Statistics Canada data. Total demand by sector is a forecast from 2017 LTEP.

Source: Statistics Canada, Ministry of Energy

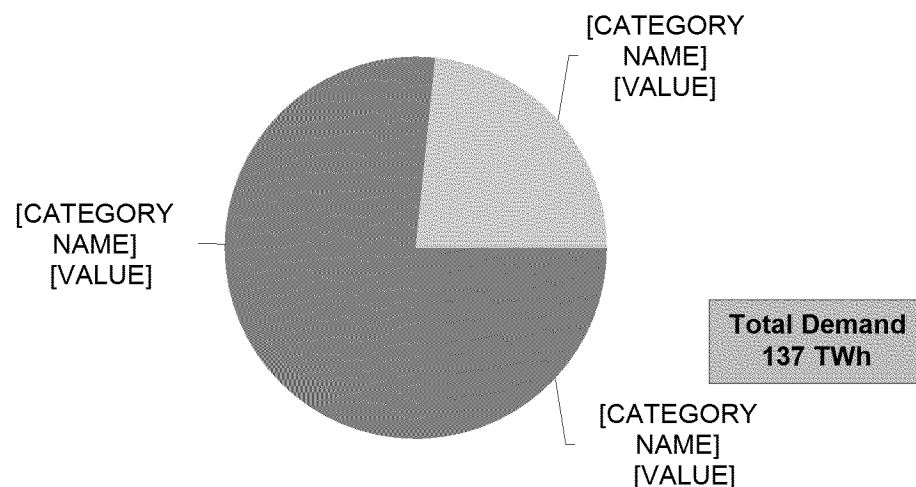
Electricity Consumers by Class

- For the purposes of billing, all electricity consumers in Ontario are considered either Class A or Class B:
 - Class A consumers are the largest consumers in the province. They are generally industrial consumers (i.e., manufacturers and mines) and large commercial (i.e., offices, large warehouses), with some large institutional consumers (i.e., hospitals and government offices).
 - The majority of Class B consumers are residential and small business consumers that pay Time-of-Use (TOU) prices under the OEB's Regulated Price Plan (RPP). All other Class B consumers are non-RPP, such as small manufacturers and restaurants.

Electricity Consumers by Class



Electricity Demand by Class (TWh)



Note: Total demand is based on 2017 actual data.

Source: OEB, Ministry of Energy

Demand by sector is only available on a forecast basis
and demand by class is only available on an actual basis

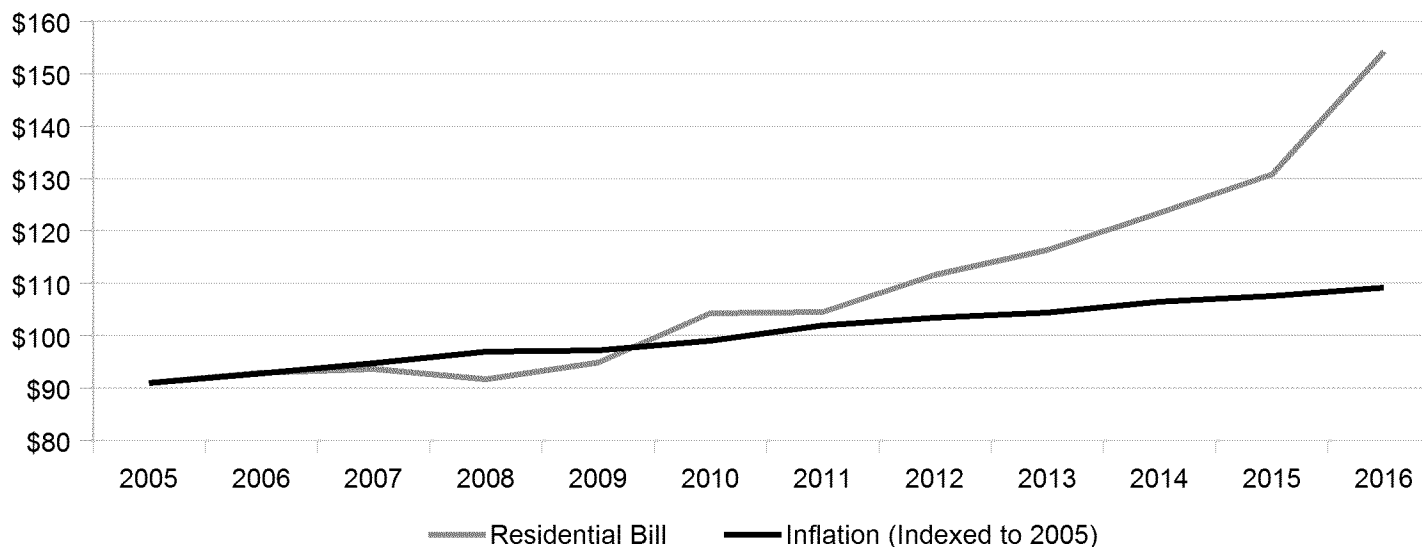
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Residential Electricity Prices

Historical Typical Residential Bills

- In Ontario, most residential electricity consumers pay commodity prices that are set by the OEB under the Regulated Price Plan (RPP).
 - In the last decade, residential electricity prices in Ontario have outpaced the rate of inflation.
- The 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), refurbished nuclear and the cost of upgrading and maintaining the province's distribution and transmission infrastructure.

Typical Monthly Residential Bill 750 kWh



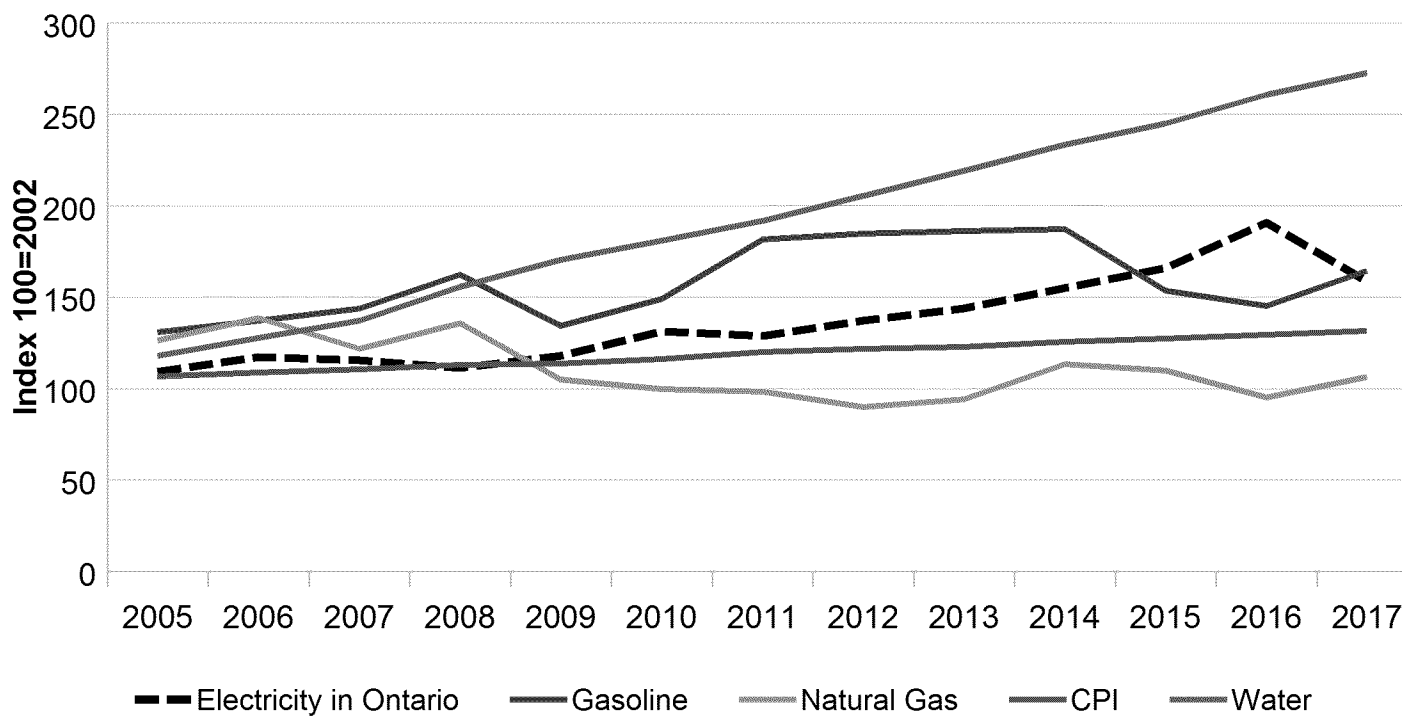
Source: Ministry of Energy, Statistics Canada

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Historical Residential Prices vs. Other Commodities

- Over the last decade, residential electricity prices have increased, while the price of natural gas has decreased.
 - For consumers with natural gas heating, the impact of increased electricity prices has been offset by decreasing gas costs, whereas consumers with electric heat have seen significant upward pressure on energy costs (i.e., especially for consumers in rural and northern Ontario that do not have access to natural gas).

Residential Electricity vs Other Commodities



Source: Statistics Canada

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Typical Residential Bill by Component

- The table below shows the make-up of a monthly residential electricity bill for a consumer using 750 kWh for May 2018.
 - It should be noted that electricity bills can vary depending on consumption (i.e., electric heat) or local distribution company.
 - In addition, some residential 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.

Components of a Typical Residential Electricity Bill

Bill Components	Monthly Cost (For a Typical Consumer in Toronto as of May 2018)	Notes
Electricity	\$61	Covers the cost of generating electricity and conservation and demand management programs. Consumers with contracts with electricity retailers pay a different rate than that listed
Delivery	\$52	Associated with the cost of delivering electricity from generators to customers
Regulatory	\$3	Recovers the costs of administering the wholesale electricity system and maintaining the reliability of the provincial grid
HST	\$15	Applied at a rate of 13%; consists of a provincial portion of 8% and a federal portion of 5%
Ontario Rebate for Electricity Consumers (OREC)	-\$9	An 8% reduction on pre-tax electricity charges equivalent to the provincial portion of HST
Total	\$123	

Note: Sum of components do not add to the Total due to rounding. The bill reflects Global Adjustment (GA) refinancing.

Source: Toronto Hydro, Ministry of Energy

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Other Residential Bill Examples

- The table below shows the make-up of a monthly residential electricity bill for two residential customer types other than the typical customer using 750 kWh per month.
 - A 2,500 square foot home in northern Ontario (Thunder Bay) with electric baseboard heat and
 - A 600 square foot apartment in southern Ontario (Waterloo).
 - Both customers have a four person household with a combined annual income of \$48,000

Residential Electricity Bills (\$/month) – Current Rates

Bill Components	2,500 Square Foot Detached House in Northern Ontario, Electric Heat	600 Square Foot Apartment in Southern Ontario
Electricity	\$171	\$24
Delivery	\$53	\$31
Regulatory	\$8	\$1
Ontario Electricity Support Program (OESP)	-\$60 (Customer is eligible for an energy intensive credit)	-\$40
Subtotal	\$172	\$16
HST	\$22	\$2
Ontario Rebate for Electricity Consumers (OREC)	-\$14	-\$1
Total	\$180	\$17

Note: Sum of components do not add to the total due to rounding. The bill reflects Global Adjustment (GA) refinancing.

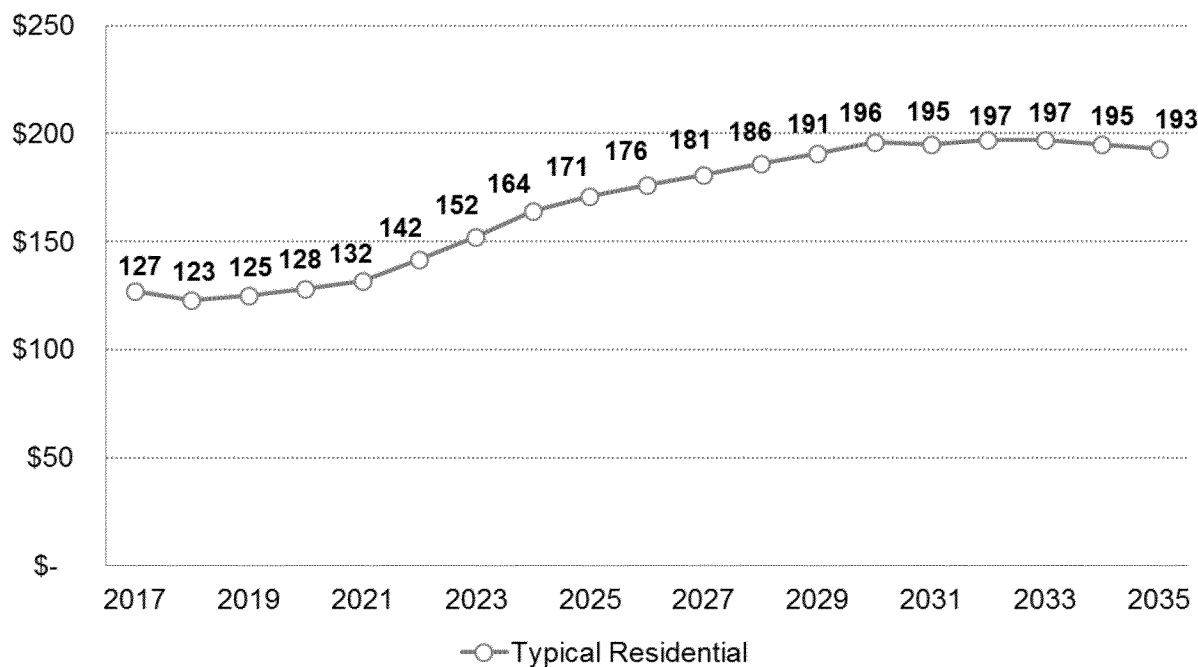
Source: OEB, Ministry of Energy

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Long-Term Typical Residential Bill Outlook

- After being held to the level of inflation in the near term under the *Fair Hydro Act, 2017*, prices are expected to increase at a faster rate than inflation beginning in 2021, primarily as a result of recovering deferred Global Adjustment (GA) charges. These increases will be more acute for residential consumers using electric heat.

Residential Monthly Bills



Source: 2017 LTEP, Ministry of Energy

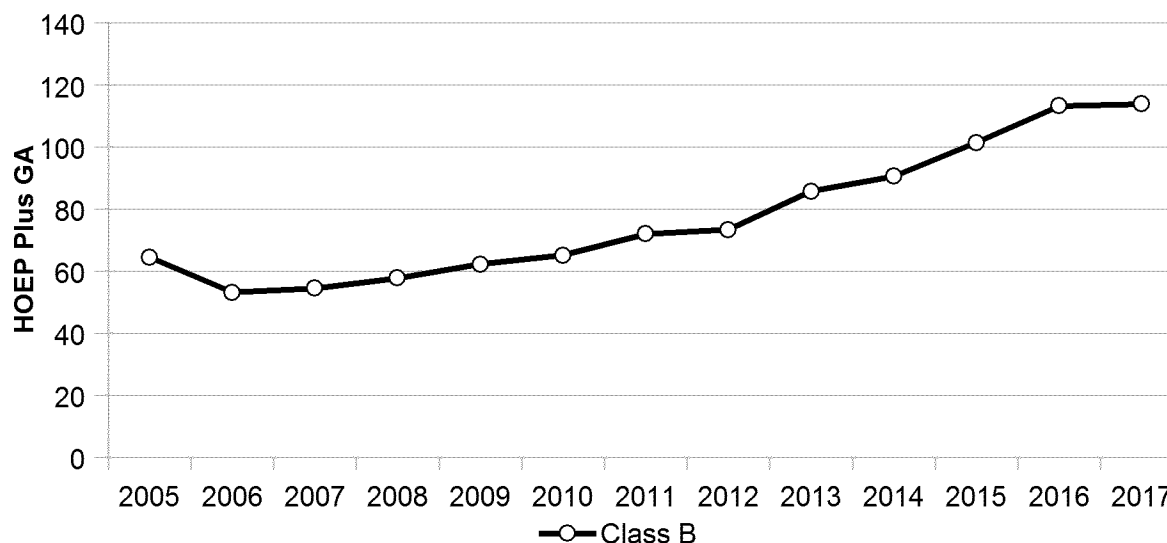
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Commercial Electricity Prices

Historical Commercial Electricity Prices

- Commercial electricity prices have increased steadily over the last decade, in large part due to an increase in the commodity portion of the bill, as shown in the chart below.

Historical Commodity Cost in Ontario for Commercial Consumers



Note: Above costs do not include delivery, regulatory or DRC charges.

Source: Ministry of Energy

Commercial Electricity Prices

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

Component	Non-RPP Class B Price in 2017 (\$/MWh)	Notes
Electricity	\$16	Covers the cost of generating electricity. Consumers with contracts with electricity retailers may pay a different rate than that listed
Global Adjustment	\$100	GA mechanism ensures recovery of long-term generation costs and conservation and demand management programs costs
Distribution	\$18	Associated with the cost of delivering electricity from distributors to customers
Transmission	\$11	Associated with the cost of delivering electricity from generators to distributors
Regulatory	\$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%; consists of a provincial portion of 8% and a federal portion of 5%
Total	\$168	

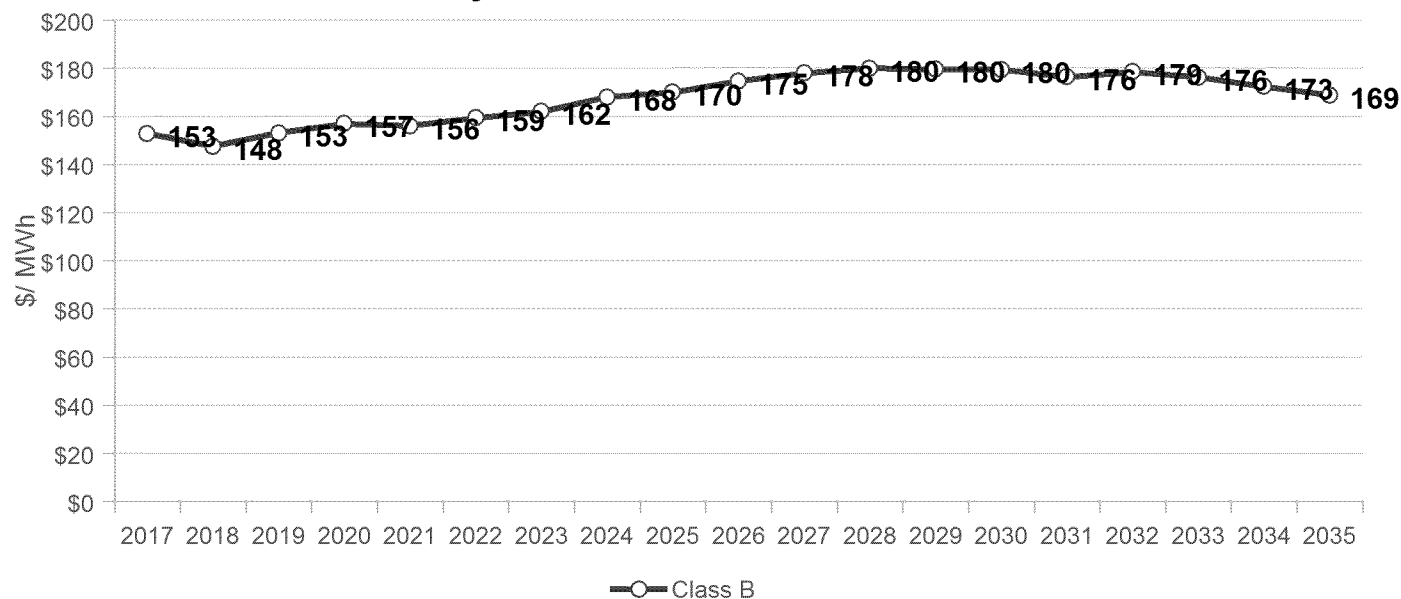
Note: Although DRC was in effect for non-residential consumers during all of 2017, in order to more accurately reflect current conditions it is not shown in the table .

Source: IESO, Toronto Hydro

Long-Term Commercial Electricity Price Outlook

- In the long-term, non-RPP Class B rates are expected to increase roughly in line with inflation. Unlike the forecasted electricity prices of other sectors, commercial electricity prices show a small decrease in later years.

Forecasted All-in Electricity Prices



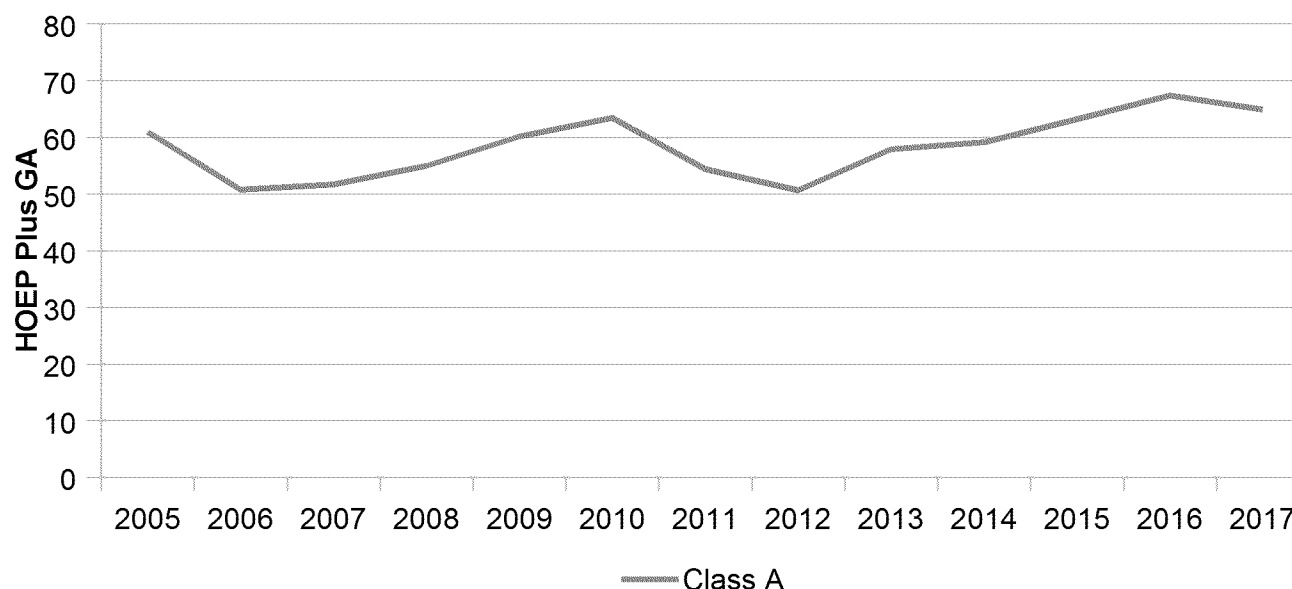
Source: 2017 LTEP

Industrial Electricity Prices

Historical Industrial Electricity Price

- The commodity cost of electricity for industrial consumers has remained relatively flat over the last decade.
 - There has been some fluctuation in the Class A GA cost from year to year related to changes in supply cost and the ability of Class A Consumers to avoid peak demand periods under the Industrial Conservation Initiative (ICI).

Historical Commodity Cost in Ontario for Industrial Consumers



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

Source: Ministry of Energy

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Industrial Electricity Prices

- The table below shows the components of a typical Class A (i.e., industrial) electricity rates for 2017.

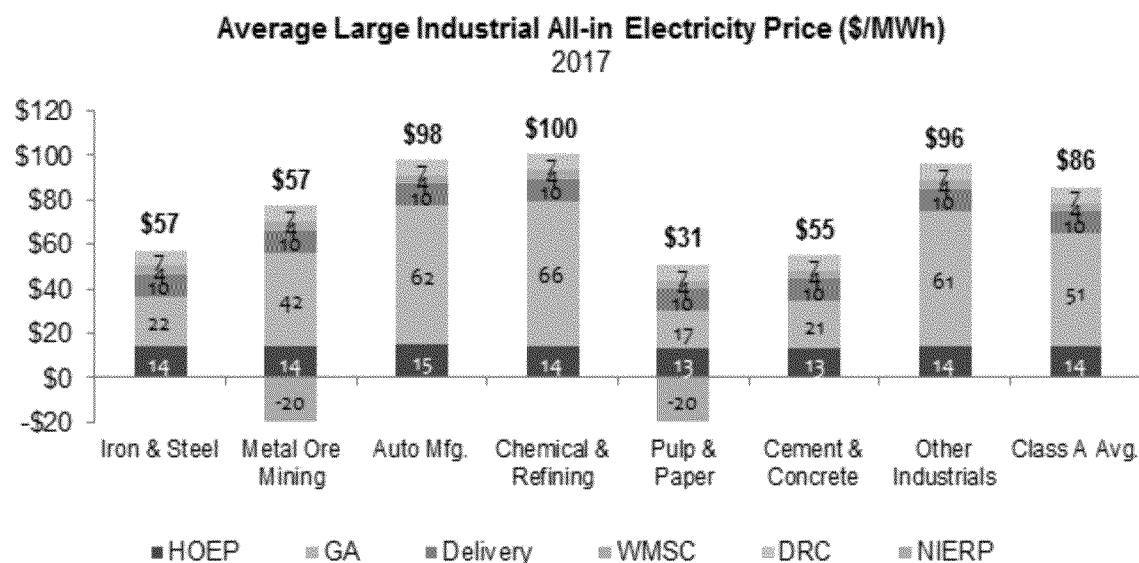
Bill Component	Class A Price in 2017 (\$/MWh)	Notes
Electricity	\$14	Covers the cost of generating electricity. Consumers with contracts with electricity retailers may pay a different rate than that listed
Global Adjustment	\$51	GA mechanism ensures recovery of long-term generation costs and conservation and demand management programs costs
Distribution	-	Associated with the cost of delivering electricity from distributors to customers
Transmission	\$10	Associated with the cost of delivering electricity from generators to distributors
Regulatory	\$4	Recovers the costs of administering the wholesale electricity system and maintaining the reliability of the provincial grid
HST	-	Applied at a rate of 13%; consists of a provincial portion of 8% and a federal portion of 5%
Total	\$79	

Note: Although the 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.

Source: IESO, Toronto Hydro

Industrial Electricity Consumers

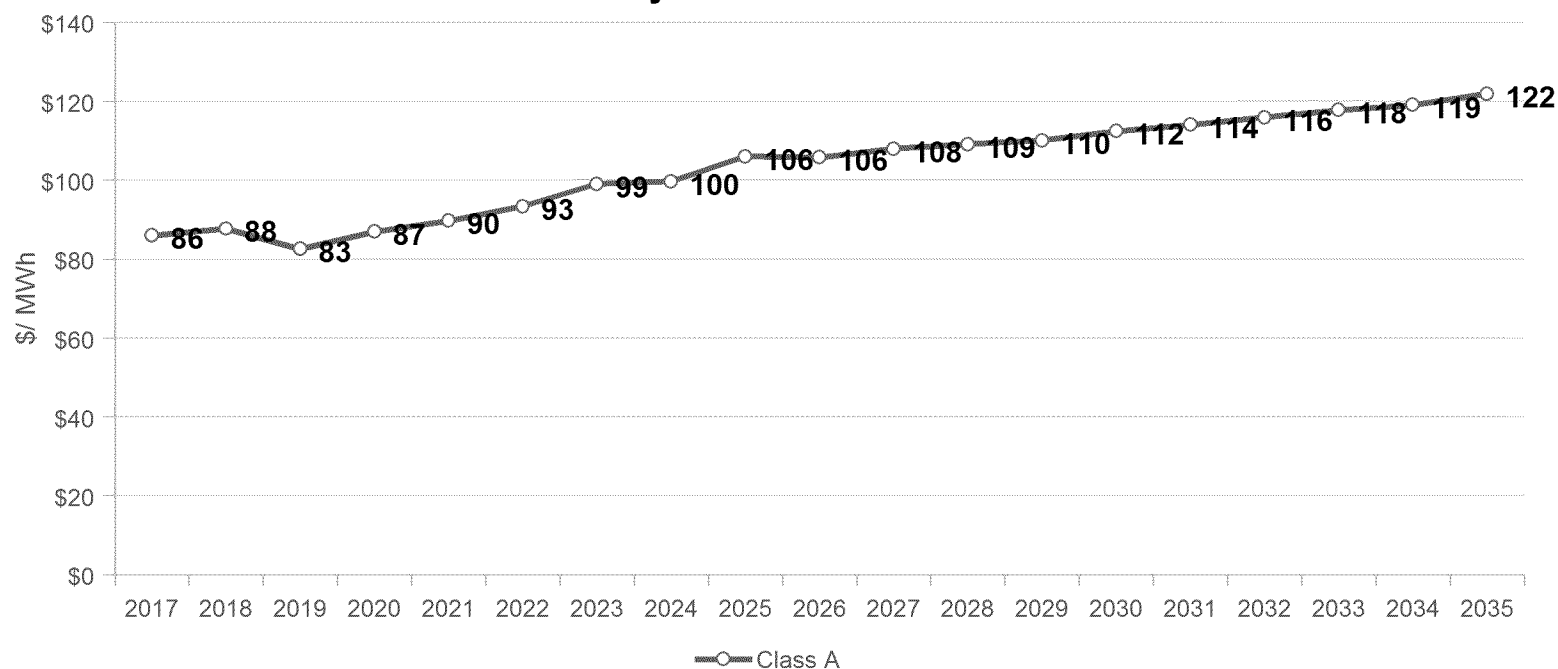
- Industrial electricity consumers range in size from small to very large and pay different prices on average by sector as a result of their relatively flat demand profile and the way that GA costs are recovered.
 - Most of the 1,100 Class A consumers are industrial (e.g., smelters, heavy manufacturing, chemistry sector).
- 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. The 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 chemical sector paid the highest. This is primarily due to the nature of their operations.



Long-Term Electricity Price Outlook – Industrial

- Class A consumers' electricity prices are expected to increase at roughly the rate of inflation to 2035.

Forecasted All-in Industrial Electricity Prices



Source: 2017 LTEP

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Current Rate Mitigation Activities

Current Rate Mitigation Activities – Residential

Global Adjustment Refinancing

- In June 2017, the *Fair Hydro Act, 2017* received Royal Assent. Under the Act, a portion of the GA is being refinanced, allowing for an immediate reduction in the amount of GA payable by eligible consumers (i.e., specified consumers under the Act).
 - Ontario Regulation 195/17, made under the Act requires the OEB to calculate Regulated Price Plan (RPP) rates for the period from May 1, 2018 – April 30, 2019 such that the typical bill increases by the rate of inflation.
- Specified consumers include all consumers eligible for the OEB's RPP, including all residents and most small businesses, as well as farms and long-term care homes.
- On July 1, 2017, the OEB set prices to reflect full implementation, reducing bills from \$162 to \$121 for a typical consumer when combined with other initiatives.
 - In April 2018, the OEB announced new RPP prices that are in effect May 1, 2018 until April 30, 2019 that have the effect of increasing a typical residential consumer's bill by 1.6% (i.e., the rate of inflation) relative to July 1, 2017. New RPP prices are:

	Price (cents / kWh)	Change from Previous Prices
Off-Peak	6.5	No change
Mid-Peak	9.4	Down 0.1 cents / kWh
On-Peak	13.2	No change

Source: OEB

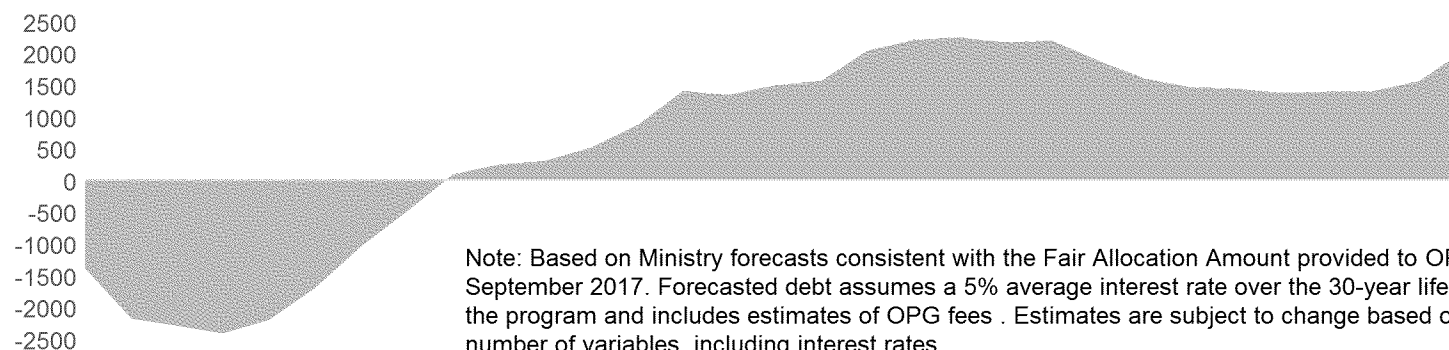
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Current Rate Mitigation Activities – Residential (cont'd)

GA Refinancing (cont'd)

- Debt is being issued in order to finance the deferred GA (i.e. the shortfall between reduced GA collected from ratepayers and IESO settlement obligations to generators). Under the program, deferred GA and the cost of refinancing will be recovered from ratepayers in later years through Clean Energy Adjustments (CEAs).
 - Ontario Power Generation (OPG) is appointed as the Financial Services Manager under the Act, and is responsible for developing a Financing Plan and establishing a financing entity (i.e., the Fair Hydro Trust) through which debt obligations are incurred and managed.
- OPG concluded its first two offerings of long-term debt on February 6, 2018 and April 24, 2018 with weighted average interest rates of 3.53% and 3.71%, respectively. The weighted average interest rate for all long term debt, including both issuances, is currently 3.6%.
 - According to OFA, the current provincial borrowing rate is 3.20%.
- Current estimates forecast peak debt at approximately \$20 billion and total interest costs of less than \$19 billion over the 30-year life of the program.

Borrowing and Repayment (\$M)



Note: Based on Ministry forecasts consistent with the Fair Allocation Amount provided to OPG in September 2017. Forecasted debt assumes a 5% average interest rate over the 30-year life of the program and includes estimates of OPG fees. Estimates are subject to change based on a number of variables, including interest rates.

Current Rate Mitigation Activities – Residential (cont'd)

Rural or Remote Rate Protection

- The Rural or Remote Rate Protection (RRRP) has existed since 2001, replacing earlier rural rate protection of Ontario Hydro. It provides for a reduction in distribution system rates for customers living in low-density or remote areas where the cost to distribute electricity is considerably higher.
- Currently RRRP provides support in the following ways:
 - Customers of Hydro One's R2 (low density) residential rate class, approximately 330,000 customers, receive a fixed credit of \$60.50/month. Since July 1, 2017, this is funded through the tax-base.
 - Most customers of Algoma Power and Hydro One Remote Communities also receive RRRP to help reduce their bills. Three small James Bay LDCs (Attawapiskat, Fort Albany, Kashechewan) also receive RRRP. This is funded by a small charge on all Ontario rate-payers. The average residential customer in Ontario pays \$0.23/month towards RRRP.
 - The annual cost of the tax-based funding for RRRP for Hydro One's R2 (low-density) customers in fiscal 2017-18 is \$166.5 million. Note: This cost reflects only 8 months of a full fiscal year (July-March).

Current Rate Mitigation Activities – Residential (cont'd)

Distribution Rate Protection

- In 2017, a new Distribution Rate Protection (DRP) program was created to provide distribution charge relief to eligible residential customers served by LDCs with the highest distribution costs.
 - Roughly 750,000 residential customers, served by the following LDCs, receive benefits from the broadened program: Hydro One (R1 and R2 rate classes), Algoma Power (R1), Atikokan Hydro, InnPower, Chapleau Public Utilities Commission, Sioux Lookout Hydro, Lakeland Power (Parry Sound) and Northern Ontario Wires Inc.
 - The program requires the OEB to set a maximum monthly base distribution charge that customers of these LDCs pay. The charge is currently set at \$36.43/month.
- This program is funded through the provincial tax base. The annual cost of the program in fiscal 2017-18 is \$146.6 million. Note: This cost reflects only 8 months of a full fiscal year (July-March).

Current Rate Mitigation Activities – Residential (cont'd)

Ontario Electricity Support Program

- The Ontario Electricity Support Program (OESP) was launched on January 1, 2016.
 - The OESP provides an ongoing rate reduction directly on the bills of low-income electricity consumers who have applied and meet the eligibility requirements.
- New eligibility categories and rates came into effect on May 1, 2017:
 - The fixed monthly credit eligible electricity consumers receive is determined based on household after-tax income and household size. Credit amounts range between \$35 and \$75 per month.
 - Consumers who face unique challenges with respect to electricity affordability and outreach receive higher credit amounts ranging from \$52 to \$113 per month. This includes Indigenous consumers, consumers who use electric heating as the primary source of heating and households using certain electricity-intensive medical devices.
 - The standard eligibility period for recipients is 2 years, and 5 years for a recipient that is 65 years of age or older, or is receiving a disability benefit under CPP.
- In April 2018, 227,375 households received OESP.
- This program is funded through the provincial tax base and administered by the OEB. The tax-based costs for the program in fiscal 2017-18 were \$31.4 million. Total program costs in fiscal 2017-18 were \$144.6 million.

Current Rate Mitigation Activities – Residential (cont'd)

Ontario Rebate for Electricity Consumers

- The Ontario Rebate for Electricity Consumers (OREC) provides an 8% reduction on pre-tax electricity charges equivalent to the provincial portion of HST.
 - OREC was effective as of January 1, 2017 and is provided for under the *Ontario Rebate for Electricity Consumers Act, 2016*. Consumers that are eligible for the rebate include residential consumers, multi-unit residential complexes, long-term care homes, small businesses, and farms.
- This program is funded through the provincial tax base. The annual cost of the program in fiscal 2017-18 is approximately \$810 million.
- **Affordability Fund**
 - Launched with \$100 million in provincial funding from fiscal 2016-17, the program provides energy efficiency improvements to homes of Ontarians who do not qualify for low-income conservation programs and who could not undertake these improvements without support.
 - The Affordability Fund website and online application were launched in October 2017 and the program is now in market.
 - Upgrades include:
 - Energy efficient power bars, block heater timers, efficient shower heads, LEDs or aerators;
 - A refrigerator, freezer, window air conditioner, dehumidifier or programmable thermostat;
 - A heat pump, comprehensive draft proofing, attic insulation, wall insulation and/or basement insulation (with an in-home visit).

Current Rate Mitigation Activities – Residential (cont'd)

Residential Electricity Tax Credits

- The table below details other electricity rate mitigation programs available to residential consumers.

Program	Description
Northern Ontario Electricity Credit	A tax credit that can save a single person up to \$151 per year, and a family up to \$232 per year.
Energy and Property Tax Credit	A tax credit that saves qualifying individuals up to \$1,043 per year, with a maximum of \$1,187 per year for qualifying seniors.

First Nation Delivery Credit

- The First Nation Delivery Credit (FNDC) was implemented in July 2017. It provides First Nation on-reserve residential customers with a credit equal to 100% of the electricity delivery charge on their electricity bills.

Current Rate Mitigation Activities – Residential (cont'd)

First Nation Delivery Credit (cont'd)

- Legislative and regulatory amendments were made to enable the successful implementation of this program.
 - Section 79.4 of the OEB Act provides for a delivery credit to offset the costs that make up the delivery line for on-reserve consumers, paid for through funds appropriated by the Legislature. It also provides for regulation making authority to define who is an on-reserve consumer and what areas constitute a reserve.
 - O. Reg. 197/17 outlines the eligibility criteria, which is limited to all First Nation residential on-reserve customers of a licensed electricity utility, regardless of whether the customer is seasonal or permanent. The definition of key terms, such as “reserve” and “member of a band”, are taken directly from the traditional meaning provided in the Indian Act.
- Since implementation in July 2017 the FNDC has been provided to over 22,000 households.
- The FNDC program is funded 100% through the provincial tax-base. The cost of the program in fiscal 2017-18 is \$13.4 million.

Current Rate Mitigation Activities – Commercial and Industrial

Removal of the Debt Retirement Charge

- As of April 2018, the Debt Retirement Charge (DRC) no longer applies and does not appear on electricity bills of non-residential consumers. The result has been a saving for all non-residential consumers of \$7/MWh (about 4% of a typical non-RPP Class B consumer's bill):
 - This is saving a 750 kW industrial customer who consumes 300,000 kilowatt hours (kWh) per month about \$25,000 per year.
 - This is saving a 5 MW industrial customer who consumes 2.4 million kilowatt hours (kWh) per month about \$200,000 per year.
 - This is saving a 50 MW industrial customer who consumes 31 million kilowatt hours (kWh) per month about \$2.6 million per year.
- In total, removal of DRC will save Ontario businesses about \$600 million annually.

Current Rate Mitigation Activities – Industrial

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 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% 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.

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Current Rate Mitigation Activities – Industrial (cont'd)

Industrial Electricity Incentive

- The Industrial Electricity Incentive (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

- This economic development program is funded by Ministry of Northern Development and Mines and administered by IESO . Currently, the Northern Industrial Electricity Rate Program (NIERP) is fully subscribed (i.e., with 19 participants representing 26 facilities at an annual cost of \$120 million).
Note: The 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% 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 – Industrial (cont'd)

Industrial Accelerator Program

- The Industrial Accelerator Program (IAP) is designed to assist transmission-connected companies, and their distribution-connected sites, to fast track capital investment in major energy conservation projects.
- There are four streams under the Industrial Accelerator Program:
 - Retrofit;
 - Process and Systems, including small capital projects;
 - High Performance New Construction; and
 - Energy Managers.

Current Rate Mitigation Activities – All Consumers

Shifting of Electricity Support Program Costs to the Tax-Base

- Beginning in 2017, the cost recovery for two electricity support programs – RRRP and OESP – was shifted from electricity bills to provincial revenues, lowering regulatory charges by approximately \$3/MWh.
 - RRRP mitigates some of the high costs of electricity distribution in rural or remote areas of the Province and is a legacy program of the old Ontario Hydro.
 - OESP is an income-tested, application-based program that lowers electricity costs for the most vulnerable consumers through a direct rebate.

Suspending Existing Generation Procurements

- Suspending the second round of the large renewable procurement process (LRP II) and the Energy-from-Waste Standard Offer Program is expected to save up to \$3.8 billion compared to the forecast in the 2013 Long-Term Energy Plan (2013 LTEP).
- The results of the final Feed-in-Tariff (FIT) 5 procurement were announced in September 2017. A highlight of procurement was that prices paid for new projects have been reduced by 50-75% since 2009, reflecting the decreasing costs of equipment and ensuring value to ratepayers.

Current Rate Mitigation Activities – All Consumers (cont'd)

IESO's Market Renewal Initiative

- The IESO is currently undertaking Market Renewal as an opportunity to improve the efficiency and operation of the electricity system and prepare for future changes.
- The IESO is actively engaging with sector stakeholders on the three work initiatives for market renewal, which include:
 1. **A Single Schedule Market:** To enhance real-time unit commitment program and a day-ahead market to reduce cost and gain efficiency;
 2. **Incremental Capacity Auction:** To reduce the cost of resource procurement; and
 3. **A Non-Emitting Resources Subcommittee:** To ensure that the unique characteristics of non-emitting resources are addressed.
- The IESO has established a variety of stakeholder forums under market renewal to enable participation.
 - The IESO is also working toward developing high-level design documents for individual market renewal initiatives. By mid-2018, IESO is expected to initiate the third phase of stakeholder engagement.
- According to the report prepared for IESO, market renewal is expected to save up to \$5.2 billion between 2021 and 2030.

Efficiencies and Rate Mitigation – Considerations

Considerations – Reducing System Costs

- In 2017, the total cost of running the electricity system was about \$21 billion. Generation accounts for nearly two-thirds (more than \$13 billion) of those costs, many of which are fixed costs recovered through GA.
- Reducing electricity system costs can lead to long-term savings that can benefit all consumers. Savings that are the result of improving efficiencies or developing more cost competitive procurements, as examples, can achieve lasting reductions in system costs. Opportunities for efficiencies and cost savings include:
 - **Suspending LRP I:** Although further legal analysis would be required, suspending LRP I would reduce electricity system costs and provide a corresponding decrease in the costs eligible to be amortized under GA refinancing.
 - **Eliminate DR Auction:** In a 2017 report, the OEB's Market Surveillance Panel (MSP) recommended that IESO reassess the value of DR. Eliminating the DR auction would reduce the regulatory component of bills for all consumers.
 - **LDC Efficiencies:** ~~In the fall of 2017, the OEB released its Strategic Blueprint that sets out its commitment to modernize the OEB's approach to regulation to keep pace with an evolving sector. In it, the OEB concludes that the Renewed Regulatory Framework for Electricity (RRFE) warrants a relook, particularly to drive a stronger focus by utilities on long-term value for consumers.~~
 - **Shifting Conservation to the Tax-Base:** Conservation programs such as the 2015-2020 Conservation First Framework (CFF) initiative are funded through GA, representing 3.1% of GA over 2018-2026. All costs related to these initiatives could be recovered from the tax-base.
- Generally, pursuing options to reduce electricity system costs would result in longer term benefits, and provide only limited near-term relief.

Considerations – Shifting Costs Within the Sector

- Shifting costs within the electricity sector can help to allocate system costs to the consumers that are responsible for those costs and create a direct incentive for those consumers to respond to price signals.
- However, when costs are shifted from one group of consumers to another, it can have large rate impacts on certain consumers.
- For example, under current market conditions, the Industrial Conservation Initiative (ICI) shifts approximately \$1 billion annually from Class A consumers to Class B consumers relative to charging all consumers GA volumetrically.
 - ICI's largest impact since its inception has been to improve or maintain industrial competitiveness for the most energy-intensive consumers.
 - While ICI provides system benefits in the form of reduced need to procure generation in the longer term, the recent expansions of ICI have not necessarily yielded the same system demand reductions as previous expansions. Recent program entrants have smaller demand and are less responsive to reducing peak demand.
- Another example of a significant cost shift...Between 2014 and 2016, a low-density rural residential customer using 750 kWh per month saw a distribution charge increase of almost \$13 per month, or 20%. In the same period, an urban customer using 750 kWh per month saw a distribution charge decrease of about \$1.40 per month, or -3.8%.
- Another example of a significant cost shift occurred when Hydro One reallocated distribution costs from its urban customers to its rural customers as part of a service allocation study. In some cases, rural rates went up by as much as \$x per month or x%.

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Considerations – Class B Electricity Consumers

- While Class B consumers have benefited from the recent removal of the Debt Retirement Charge (DRC) and the shifting of cost recovery of social programs from electricity bills to provincial revenues, Class B rates are considerably higher than both residential and industrial rates.
- Non-RPP Class B electricity consumers are experiencing significant increases in rates and have little ability to mitigate these increases. Electricity rate mitigation activities to date have focused largely on residential and large industrial consumers.
 - Residential consumers have experienced some targeted relief in addition to the broad relief provided by GA refinancing and the Ontario Rebate for Electricity Consumers (OREC), but will experience increases in the coming years.
 - Some large industrial consumers have experienced some targeted relief from geographic-industry specific type programs like NIERP (i.e., a tax-based program for electricity consumers in the forestry, steel and mining sectors in northern Ontario). Note: 1,100 large consumers benefit from ICI.
- ~~In its RPP Roadmap report, the OEB referenced the potential to use a similar cost allocation to time-of-use (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.~~

Considerations – Rate Relief Delivered Broadly

- The Ontario Rebate for Electricity Consumer (OREC) is the single largest electricity mitigation program and it is available to all households and small businesses regardless of their ability to pay.
 - Consideration could be given to targeting OREC or replacing it with a broader Ontario Electricity Support Program (OESP).
- OREC provides a rebate equivalent to the provincial portion of HST, or 8%. The rebate saves a typical residential consumer approximately \$9 per month.
 - The cost of the program in fiscal 2017-18 is projected to be approximately \$810 million.
- The table below summarizes the ratepayer benefit and fiscal impact of OREC.

Program	Ratepayer Benefit	Fiscal Cost
OREC (existing program)	\$9/month	\$810 million

Considerations – Economic Development / Environment

- Renewable electricity capacity procured under the *Green Energy Act*, notably the Feed-in-Tariff (FIT) program, as well as refurbished nuclear generation, has played a role in economic development.
- Changes to Ontario's electricity system have led to a number of environmental benefits. For example, the majority of the province's GHG reductions are due to coal closure.
- Despite the above-noted economic development and environmental benefits, electricity consumers continue to pay the related costs of investments in the electricity system even though the benefits extend beyond the sector.
 - In particular, the Auditor General of Ontario (AGO) has been critical of the FIT program, which offered renewable energy producers well above market price for their power, claiming that ratepayers will pay \$9.2 billion more for new renewable energy generation than if the government had continued with its previous competitive procurement policy.

Considerations – Adequate Near-Term Supply

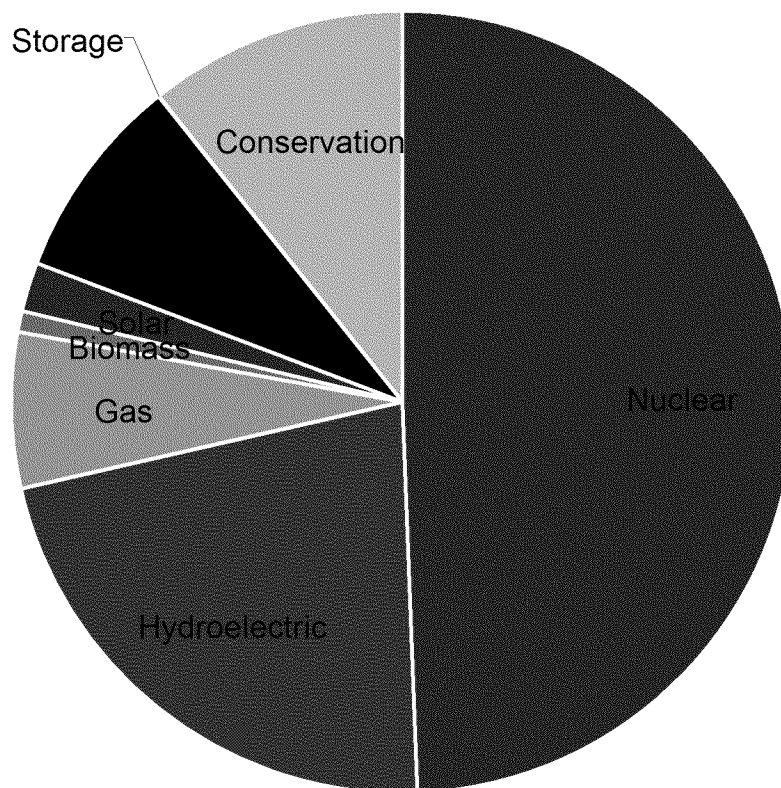
- Based on the supply and demand outlook in the 2017 LTEP, the province's current resources will provide sufficient supply for the near term.
- It is not until the early-to-mid 2020s that a shortfall in capacity is expected, as the Pickering Generating Station reaches its end of life and nuclear units at Darlington and Bruce are temporarily removed from service for refurbishment.
- This adequate supply of electricity in the short to medium-term provides the opportunity to make adjustments to the system (e.g., suspending LRP I, reducing or eliminating DR) while not having to commit to new supply.

Appendix

Ontario's Electricity Generation and Conservation

- In 2018, Ontario is expected to meet more than 90% of its electricity energy needs from emission-free resources (e.g., nuclear and renewables), conservation and storage.

2018 Generation and Conservation



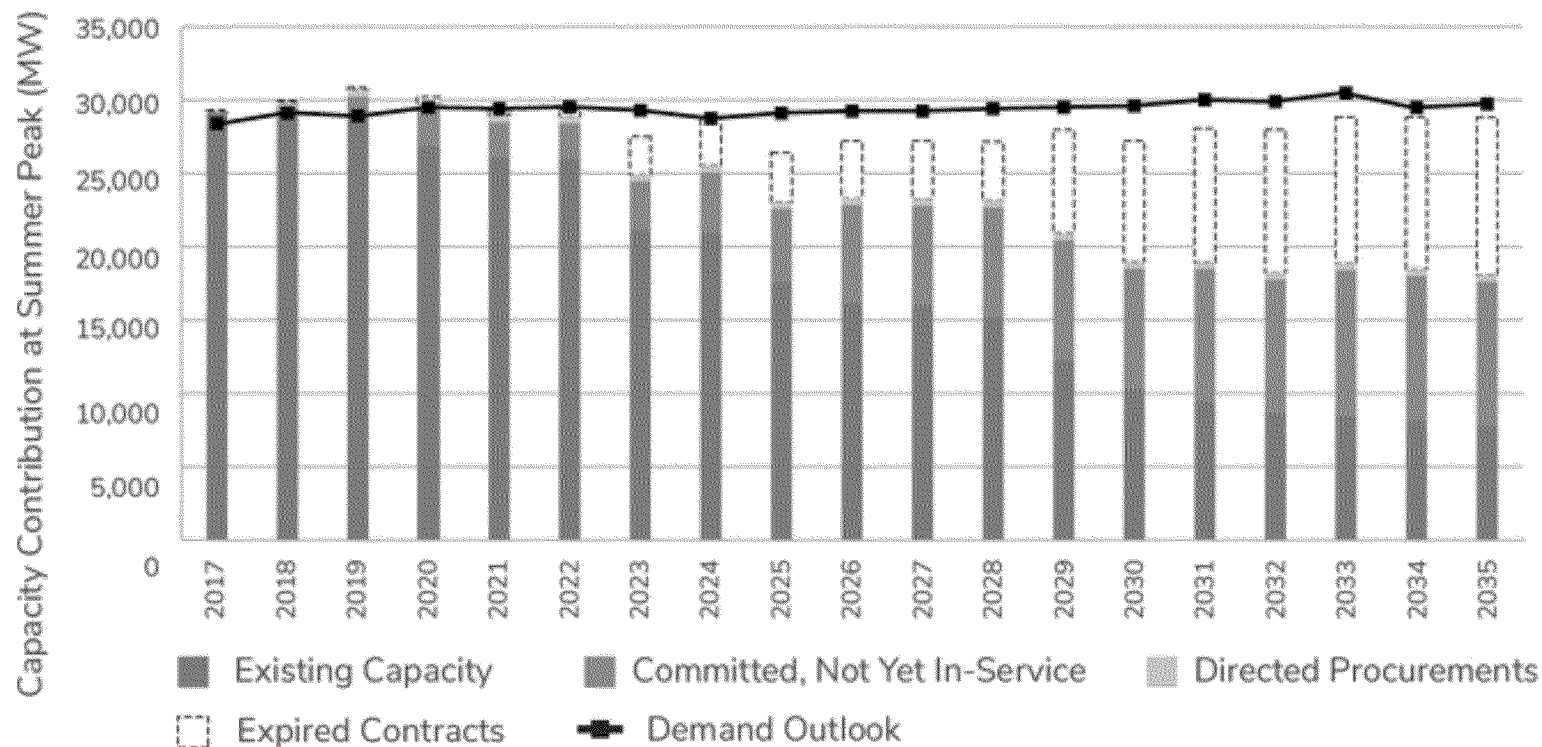
	TWh	%
Nuclear	83	49.4%
Hydroelectric	37	22.0%
Gas	11	6.4%
Biomass	1	0.9%
Solar	3	2.0%
Wind	14	8.5%
Storage	0.04	0.02%
Conservation	18.1	10.7%
Total	169	100%

Source: Ministry of Energy

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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

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GA Refinancing Impacts on Bills

- Under *Ontario Regulation 195/17*, made under the *Ontario Fair Hydro Plan Act*, the impacts of Global Adjustment (GA) refinancing are calculated based on a typical consumer with the following characteristics:
 - Customer of Toronto Hydro, consistent with previous ministry forecasts;
 - 750 kWh monthly consumption, the average used by the Ontario Energy Board (OEB); and
 - Time-of-use customers that consumes 65% off-peak, 17% mid-peak, and 18% on-peak, the average profile used by the OEB.
- Under the act, in 2017 the OEB was required to calculate Regulated Price Plan (RPP) rates that would result in a 25% reduction for the typical consumer relative to what they would have paid in the absence of the act.
 - The 25% reduction includes the 8% rebate and shifting of cost recovery for electricity support programs from electricity bills to provincial revenues.
 - The OEB also calculates a “GA Modifier”, or credit, to be applied to the bills of specified consumers who are not RPP customers, such as residents who have signed a contract with an electricity retailer.
- Actual impacts on consumer bills vary depending on their consumption, the rates charged by the local utility, and cost of retail contract where applicable.

Jurisdictional Comparison – Residential

- The following table compares published residential electricity prices in Canadian provinces and U.S. states for 2017.

2017 Residential Electricity Prices (Canadian c/kWh)					
Jurisdiction	Cost	Jurisdiction	Cost	Jurisdiction	Cost
1 Quebec	7.45	18 Missouri	14.61	35 Saskatchewan	16.67
2 Manitoba	8.97	19 Montana	14.65	36 Arizona	16.74
3 British Columbia	10.27	20 Texas	15.10	37 Ohio	16.78
4 Alberta	11.11	21 North Carolina	15.32	38 Indiana	16.84
5 Newfoundland	11.68	22 Ontario - July	15.35	39 New Mexico	16.92
6 Louisiana	12.53	23 Wyoming	15.38	40 Alabama	17.03
7 Washington	12.64	24 Georgia	15.40	41 Prince Edward Island	17.24
8 Canadian Average	12.77	25 Virginia	15.41	42 Minnesota	17.46
9 Idaho	13.08	26 Florida	15.52	43 District of Columbia	17.55
10 New Brunswick	13.69	27 Mississippi	15.60	44 South Carolina	17.59
11 North Dakota	13.92	28 South Dakota	15.62	45 Illinois	17.69
12 Arkansas	13.94	29 Oklahoma	15.85	46 Kansas	18.20
13 Tennessee	14.31	30 West Virginia	15.91	48 Delaware	18.25
14 Oregon	14.32	31 Colorado	16.01	49 U.S. Average	18.30
15 Nebraska	14.32	32 Iowa	16.33	50 California	18.88
16 Utah	14.39	33 Nevada	16.51	51 California	18.88
17 Kentucky	14.42	34 Nova Scotia	16.51	52 Pennsylvania	19.38
				53 Wisconsin	19.97
				54 Michigan	20.64
				55 New Jersey	21.11
				56 Maine	21.51
				57 New York	23.20
				58 Vermont	23.75
				59 New Hampshire	25.47
				60 Rhode Island	26.32
				61 New England	26.36
				62 Connecticut	26.96
				63 Massachusetts	27.74
				64 Alaska	28.70
				65 Hawaii	40.64

Note: The Ontario residential prices are based on a Toronto Hydro time-of-use Regulated Price Plan (RPP) customer with a monthly consumption of 750 kWh, with 65% of consumption occurring off-peak, 17% occurring mid-peak, and 18% occurring on-peak.

Ontario - July illustrates typical residential prices as of July 1 2017, without the 8% rebate equivalent to HST.

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. 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 residential 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 = 1.34 CAD.

Source: Hydro Quebec; U.S. Energy Information Administration

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Jurisdictional Comparison – Commercial (cont'd)

- 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 % 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

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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	Jurisdiction	Cost
1 Manitoba	4.32	18 Kentucky	7.44	35 Ohio	8.81	52 North Dakota	11.41
2 Newfoundland	4.90	19 New Brunswick	7.50	36 U.S. Average	8.81	53 Maryland	11.48
3 Quebec	4.91	20 New York	7.54	37 West Virginia	8.99	54 Maine	12.58
4 Alberta	5.67	21 Utah	7.57	38 Pennsylvania	9.19	55 New Jersey	13.12
5 Washington	6.08	22 Idaho	7.77	39 Wyoming	9.26	56 Vermont	13.44
6 British Columbia	6.29	23 South Carolina	7.82	40 Prince Edward Island	9.31	57 California	14.13
7 Montana	6.41	24 Arizona	7.85	41 Colorado	9.43	58 New Hampshire	16.51
8 Ontario - North	6.56	25 North Carolina	7.92	42 Michigan	9.75	59 Connecticut	17.52
9 Nevada	6.68	26 Tennessee	7.93	43 Indiana	9.83	60 Massachusetts	17.81
10 Louisiana	6.69	27 Alabama	7.97	44 Kansas	9.89	61 Rhode Island	18.95
11 Oklahoma	6.87	28 Oregon	8.01	45 Nebraska	9.91	62 Alaska	22.42
12 Canadian Average	6.89	29 New Mexico	8.02	46 Minnesota	10.04	63 Hawaii	29.87
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		

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 50 MW with monthly consumption of 30,600 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

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Considerations – Jurisdictional Comparison (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:
 - **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. Note: Delivery charges vary by local distribution company.
 - **Consumption Profiles:** Published prices are constructed based on typical consumers. To the extent that not all consumers are typical, prices will differ. For example, a consumer with electric heating would have a much different consumption profile than a typical consumer, leading to a difference in prices paid.
 - **Support programs:** Posted prices generally do not reflect government programs, such as the Ontario Electricity Support program (OESP).
 - **Exchange Rates:** Prices for U.S. states are reported in U.S. dollars. If converted to Canadian dollars, the comparison may not be totally meaningful, as exchange rates often reflect macroeconomic conditions that are unrelated to electricity prices.
- There are a handful of public sources that report on electricity prices in Canadian provinces and U.S. states, such as the U.S. Energy Information Administration (EIA).
 - These price comparisons can be helpful in order to better understand how Ontario’s residential electricity prices compare to other North American jurisdictions.
 - Supply mix is the largest determinant of electricity prices. Jurisdictions with significant hydroelectricity tend to have the lowest electricity prices. Note: Higher proportions of renewables can result in higher prices.