

Electricity Pricing in Ontario

Transition 2018

Foundation Briefing

CONFIDENTIAL

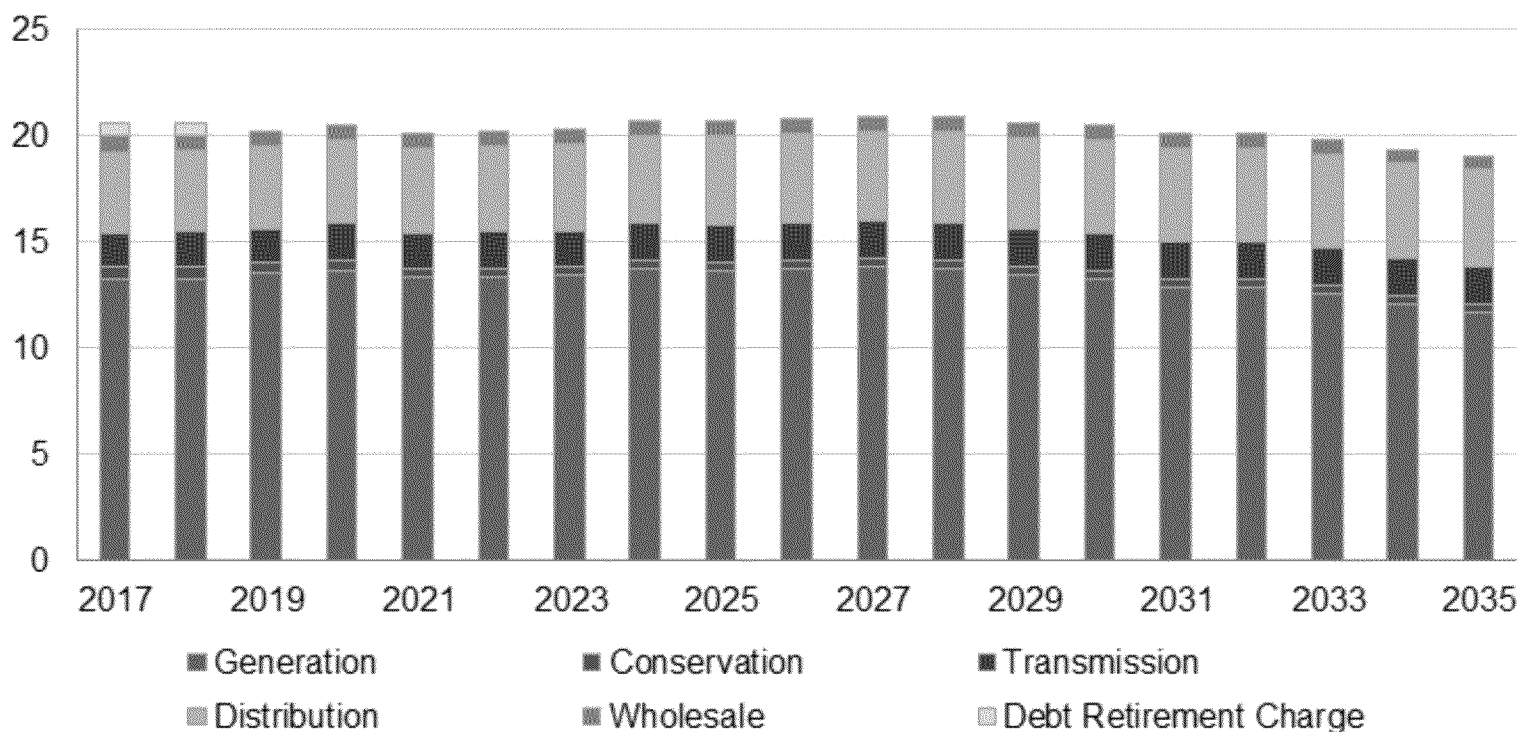
Electricity Pricing Overview

- Ontario's electricity system costs are recovered through a number of charges that cover the cost of generating electricity, transmitting electricity to where it is needed and maintaining a reliable system.
- These charges include:
 - Commodity: which has two components:
 - The wholesale market price, known as the Hourly Ontario Energy Price (HOEP); and
 - Global Adjustment (GA), a mechanism that accounts for the difference between HOEP and the regulated and contract prices that generators receive, along with the cost of conservation programs.
 - Delivery: which has two components:
 - Transmission, which reflects the cost to transport electricity from generators to distribution systems; and
 - Distribution, which reflects the cost to transport electricity to homes and businesses.
 - Regulatory: which has a number of relatively small components that cover the costs of administering the wholesale electricity system and maintaining the reliability of the provincial grid.

Projected Cost of Electricity Service 2017-2035

- Total electricity system costs are forecast to remain relatively flat in real terms over the planning horizon (2017-2035).

Total Cost for Electricity Service (Billions \$2017)



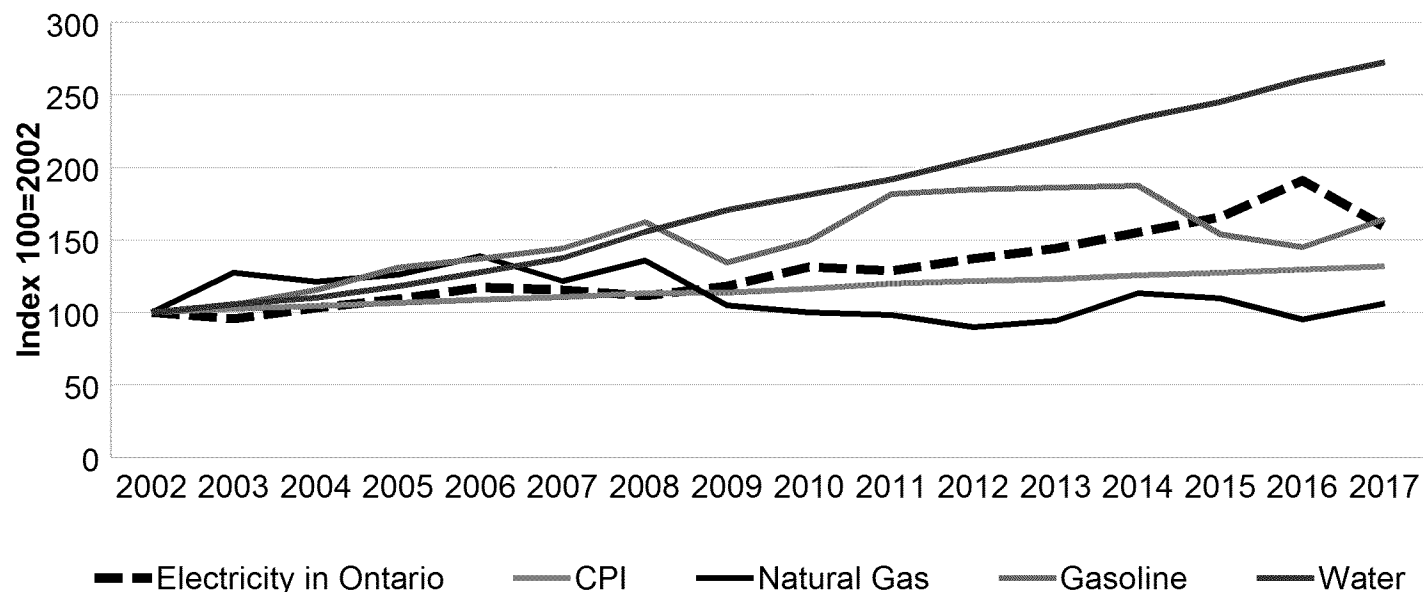
Source: IESO

Historical Residential Electricity Prices

- For more than a decade, electricity prices in Ontario increased more than in most other North American jurisdictions and outpaced the overall rate of inflation.
- 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.

Electricity Prices vs. Other Commodities

Ontario



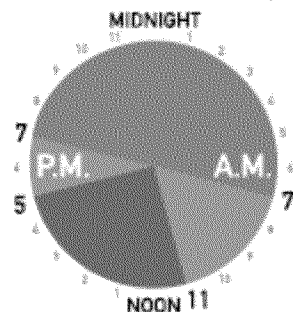
Source: Statistics Canada

Residential and Small Business Consumers Electricity Pricing

Regulated Price Plan (RPP)

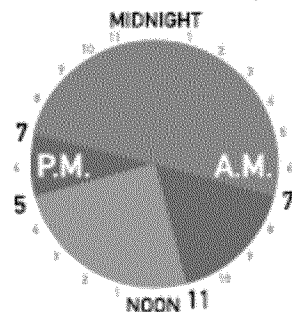
- There are about five million residential and small business consumers participating in the RPP. Most residential and small business consumers pay Time-of-Use (TOU) prices under the Ontario Energy Board's (OEB) RPP.
- RPP prices are adjusted by the OEB based on projected supply cost as well as the *Ontario Fair Hydro Act*.
- TOU prices are intended to provide an incentive to consumers to shift consumption away from high demand periods when the cost to meet province-wide demand is higher.

Summer-Weekdays



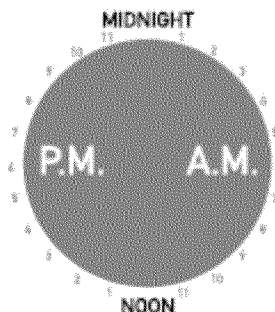
\$ Off-peak

Winter-Weekdays



\$\$ Mid-peak

Weekends & Holidays



\$\$\$ On-peak

**RPP Time of Use Prices
Effective May 1, 2018**

	Price (c/kWh)
Off-Peak	6.5
Mid-Peak	9.4
On-Peak	13.2

Source: Ministry of Energy, Ontario Energy Board (OEB)

Current Residential Electricity Bill

- The table below shows the make-up of a monthly electricity bill for a consumer using 750 kWh for May 2018.
 - Electricity bills can vary depending on consumption (i.e., electric heat) or LDC.
 - 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 (for a Toronto consumer)

Bill Components	Monthly Cost	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 per cent 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	

Source: Toronto Hydro, Ministry of Energy Note: Sum of components do not add to the Total due to rounding.

Electricity Prices as a Share of Household Spending

- The table below shows Ontario household spending on electricity and the total before-tax income of households in 2016 (prior to the *Ontario Fair Hydro Act*).

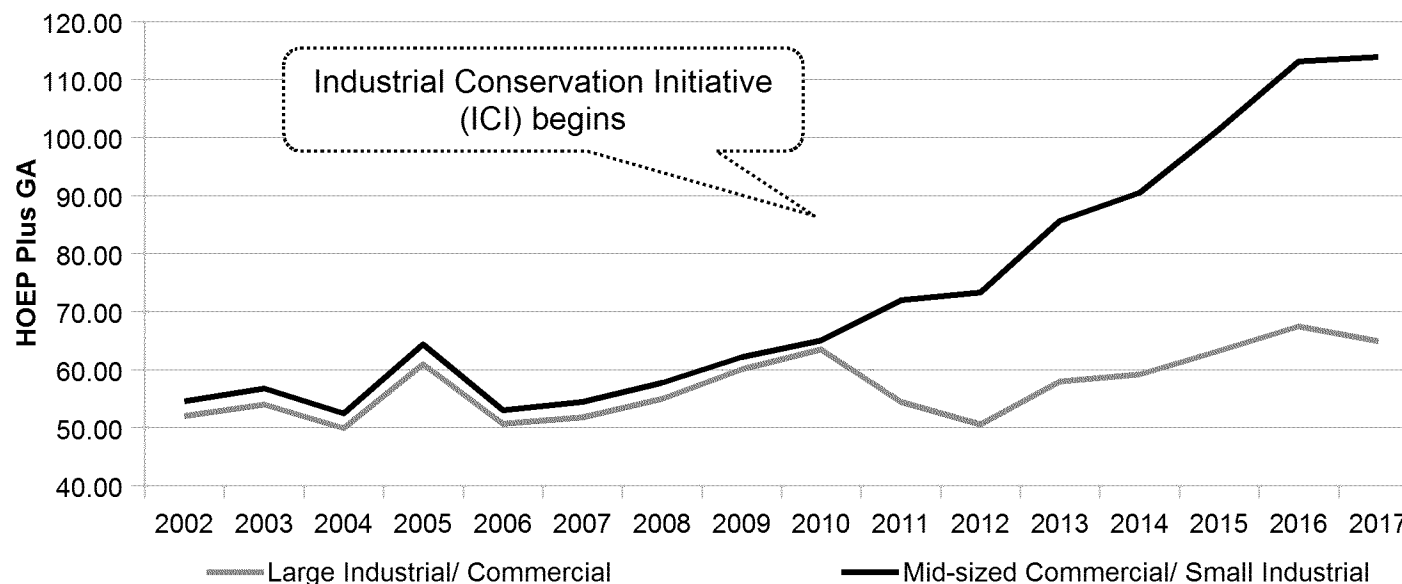
Households (2016)	Household Spending on Electricity (\$)	Total Household Spending (\$)	Electricity as a Share of Household Spending
Lowest 20%	885	35,628	2.5%
Highest 20%	2,235	175,436	1.3%
All	1,524	88,953	1.7%

- Within each category of households, there is wide variation in what individual households spend on electricity as a share of total household spending. Electricity expenditure may represent a much higher share of household spending for some lower-income households, households connected to certain rural local distribution companies, or those with electric heating.
- There are currently several rate assistance programs in place that target low-income households and rural consumers.

Historical Commercial/Industrial Electricity Prices

- 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

Current Commercial/Industrial 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 (\$/MWh)	Class A (\$/MWh)	Notes
Electricity	\$16	\$14	Covers the cost of generating electricity. Consumers with contracts with electricity retailers may pay a different rate than that listed
Global Adjustment	\$100	\$51	The Global Adjustment (GA) mechanism ensures recovery of long-term generation and conservation
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%; consists of a provincial portion of 8% and a federal portion of 5%
Total	\$168	\$79	

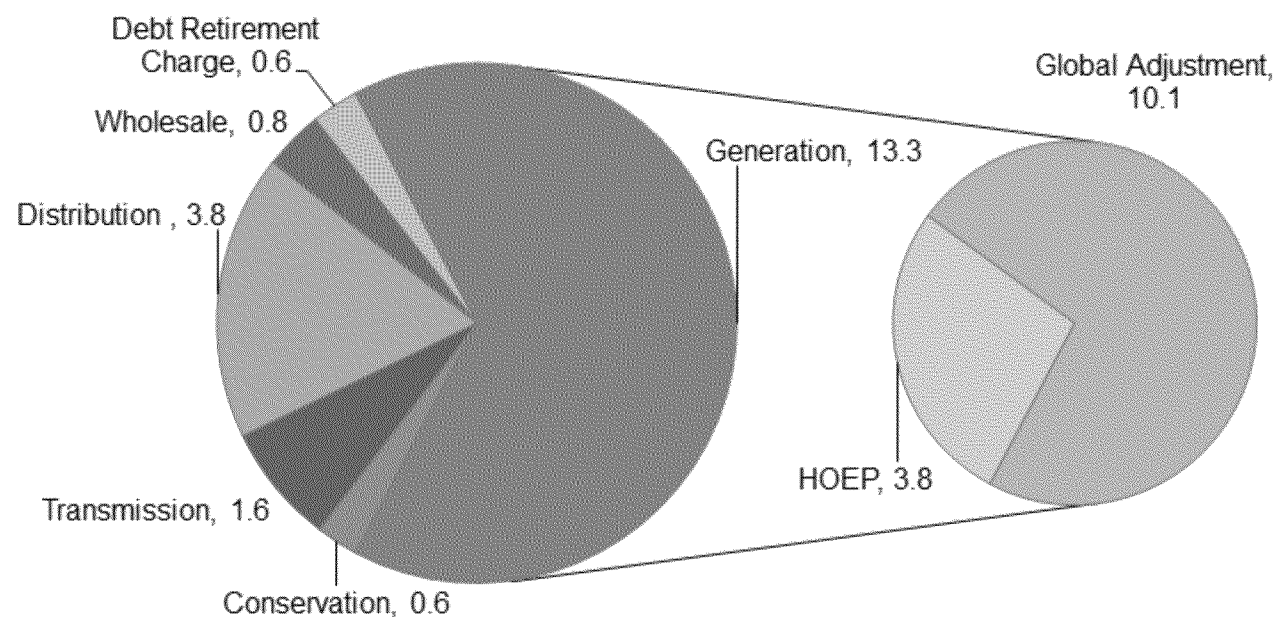
Note: Although Debt Retirement Charge (DRC) was in effect for non-residential consumers during 2017, it is not shown in order to more accurately reflect current conditions. Many industrial electricity consumers do not pay HST, as they receive tax credits equal to HST expenditures on electricity.

Source: IESO, Toronto Hydro

Ontario's Electricity System Costs

- In 2017, generation accounted for about two-thirds of total electricity system costs. Total system costs in 2017 were \$21 billion.

2017 Electricity System Cost \$2017 billion



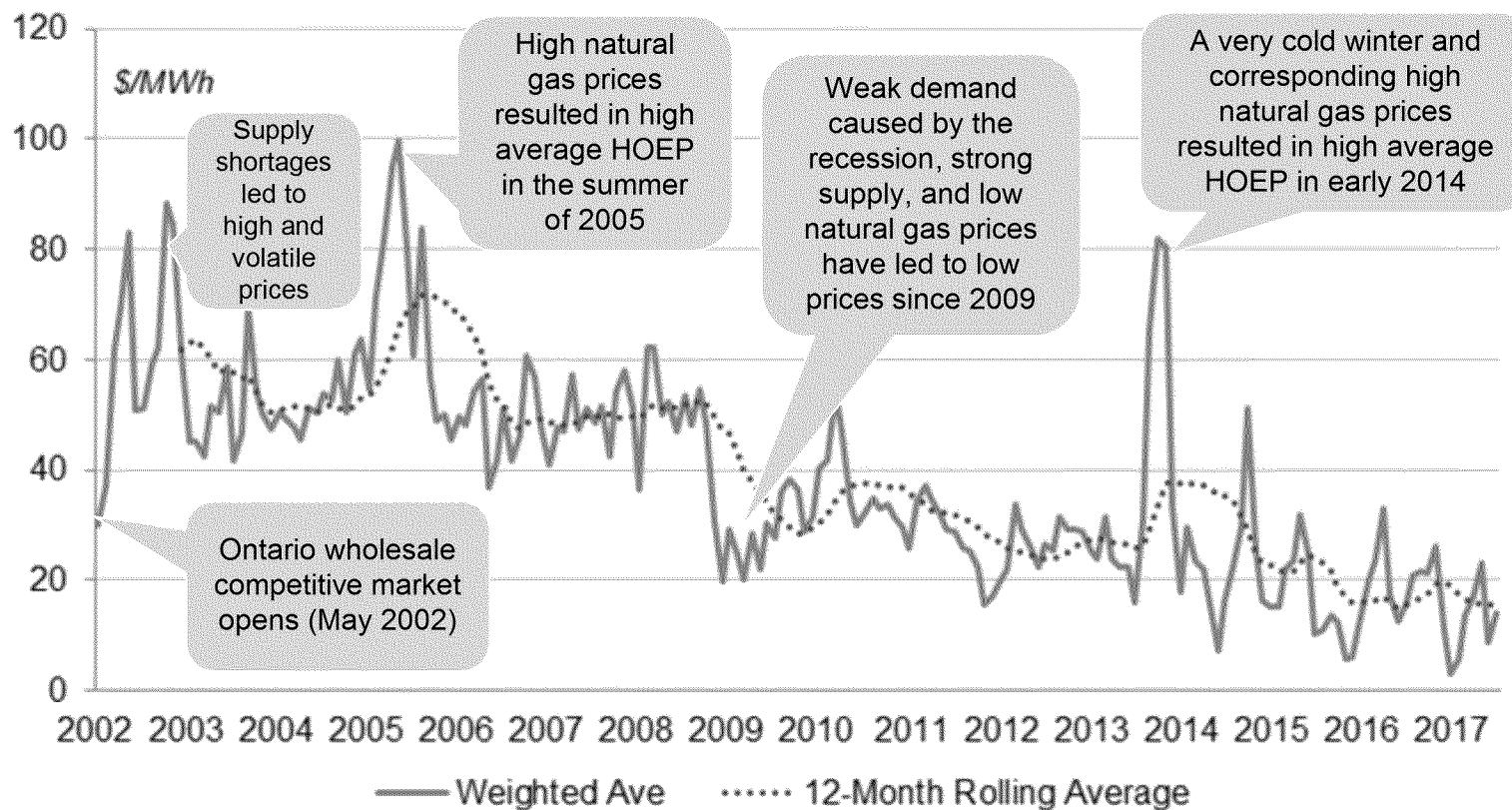
Source: 2017 LTEP Modules

Paying for Generation

- Payments to generators are made up of two components:
 1. Hourly Ontario Energy Price (HOEP)
 - All generators receive HOEP for the electricity they supply. HOEP is determined by supply and demand conditions in the wholesale market. It generally reflects the marginal cost of electricity generation in the province.
 2. Global Adjustment (GA)
 - Contracted/regulated generators receive additional payments to make up the difference between the revenue generated through the wholesale market and their required contracted or regulated revenue. This difference is recovered from or returned to Global Adjustment (GA).
 - Virtually all generators in Ontario receive a contracted or regulated rate.
 - Conservation costs and funding programs, such as the Indigenous Community Energy Plan program, are also paid for from GA.
- HOEP and GA are inversely related; as the market price increases, the GA payments decrease. HOEP is primarily influenced by supply, demand and fuel costs.

Historical Market Prices

Weighted Monthly Average Hourly Ontario Energy Price

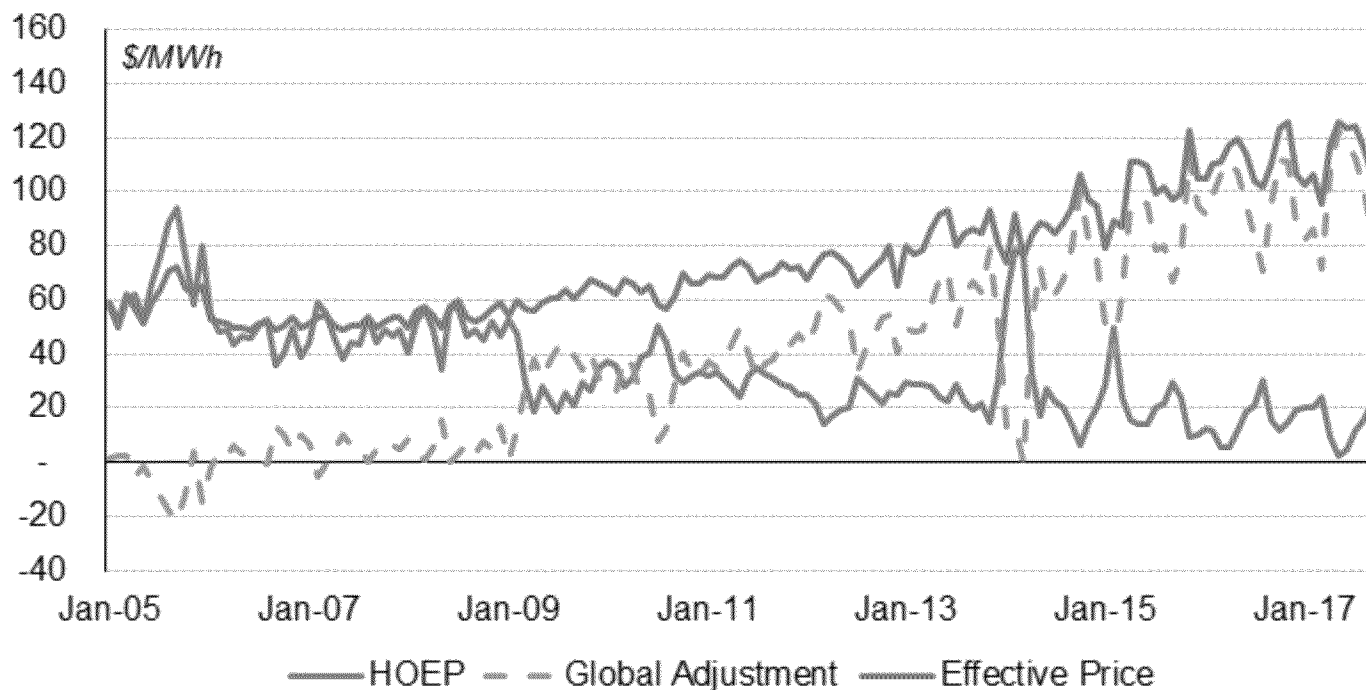


Source: IESO

Historical Global Adjustment

Global Adjustment (GA) experienced significant growth beginning in early 2009 as HOEP declined and IESO-contracted energy production increased.

Commodity Cost of Electricity 2005-2017

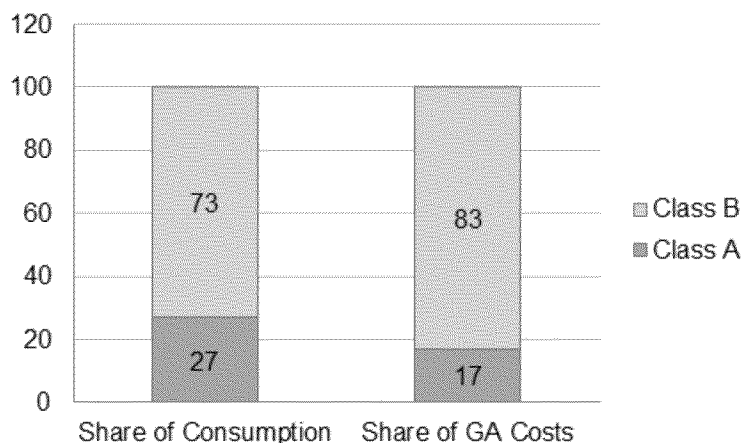


Source: IESO

How Global Adjustment is Applied to Consumers

- Global Adjustment (GA) costs are charged differently depending on the consumer group. The table below shows a breakout of all electricity consumers in Ontario by type:

Customer Type	Current Consumers	GA Paid in 2017 (\$)	GA Treatment
RPP Class B	About 5 million	6.7 billion	Charged GA as a flat rate applied to their consumption. GA varies with time-of-use and tiered for consumers participating in RPP.
Non-RPP Class B	50,000	3.5 billion	Charged GA as a flat rate applied to their consumption. For these consumers, GA is the same in each hour of the month.
Class A	About 1,100	1.7 billion	Charged GA on the basis of their contribution to system peak demand during the highest five system demand hours of the year.
Total	5.05 million	11.9 billion	



- Currently, 1,100 Class A consumers use about 27% of Ontario's electricity, and pay 17% of total GA costs each month.

Global Adjustment Refinancing Impact on Cost Recovery

- The *Fair Hydro Act, 2017* and associated regulations created a group of consumers eligible for the GA refinancing program, called “specified consumers.”
- GA refinancing provides a GA reduction for specified consumers by debt financing the shortfall between the reduced GA collected from ratepayers and payments to generators.
- The definition of “specified consumers” is aligned with the *Ontario Rebate for Electricity Consumers Act, 2016*, which means consumers who are eligible for the 8% rebate are also specified consumers. This includes:
 - All residential consumers, including multi-unit residential buildings and long-term care homes;
 - All consumers eligible for the Ontario Energy Board (OEB)’s Regulated Price Plan (RPP), including small businesses and farms in addition to residences, and;
 - Consumers who are eligible for the RPP, but have opted out to sign a contract with an electricity retailer.
- The vast majority of specified consumers are Class B RPP-eligible consumers, however some Class A consumers could also be specified consumers, such as a large farming business.
- Under the legislation, deferred GA and the cost of refinancing will be recovered from specified consumers in later years through “Clean Energy Adjustments” (CEAs).

Delivery Costs

- Delivery costs includes many different charges to ensure the delivery of electricity from generating stations across the province to homes and businesses through transmission and distribution lines.
- This charge varies from utility to utility due to such factors as: the age and condition of the equipment; the size of the service territory; customer density; and, the geographic location of the service territory.
- Charges include:
 - **Distribution Charge:** A charge by consumption for the costs of maintaining the distribution system. The charge is currently comprised of fixed and variable components. The variable component will be eliminated for most distributors by 2019, and for all distributors by 2023.
 - **Transmission Charge:** A variable charge by consumption for the costs of transmitters to operate and maintain the high voltage transmission system
 - **Line Loss Adjustment:** As electricity travels across the lines there is a slight loss of power. This charge pays for the cost of that loss.

Wholesale Market Service Charges

- Customers cover the cost of operating and administering the electricity system in the form of regulatory charges on the electricity bill.
- Wholesale market service charges covers the cost of operating the wholesale electricity market and maintaining the reliability of the power grid, including administration costs of the Independent Electricity System Operator (IESO), as well as costs associated with connecting renewable generation.
- The Rural and Remote Electricity Rate Protection (RRRP) charge, is collected to offset the higher costs of providing service to consumers in remote and rural areas (partially offset by the tax base).
- Over the 2017 to 2035 period, wholesale market costs are expected to average approximately \$677 million (\$2017) per year. On a typical residential bill, this represents an average monthly charge of approximately \$3.

Residential Rate Mitigation – Existing Programs

Program	Description
Ontario Rebate for Electricity Consumers (OREC)	Provides a rebate equivalent to the provincial portion of HST, or 8%. The rebate saves a typical residential consumer approximately \$9 per month.
Ontario Electricity Support Program (OESP)	The Ontario Electricity Support Program (OESP) is an income-tested, application-based program that lowers electricity costs of the most vulnerable consumers with a rebate directly on bills. This program is tax-funded.
Distribution Rate Protection	Distribution Rate Protection provides tax-funded rate protection to approximately 800,000 full-time residential customers of 8 Local Distribution Companies (LDCs) with some of the highest distribution rates.
Rural or Remote Rate Protection	Available to very rural customers of Hydro One to provide a fixed credit of \$60.50/month off their distribution costs. (RRRP is also provided to Algoma Power and Hydro One Remote Communities Inc., but this funding is sourced from the ratebase).
First Nations Delivery Credit (FNDC)	A 100% rebate of all delivery charges for First Nation residential customers living on reserve.

Residential Rate Mitigation – Existing Programs, cont'd.

Program	Description
Ontario Energy and Property Tax Credit (OPETC)	Provides low- to moderate- income Ontarians, including seniors, who own or rent a home with help paying both their energy costs and property tax. Qualifying individuals can receive up to \$1,043 in tax relief for 2018, and seniors can receive up to \$1,187.
Northern Ontario Energy Credit (NOEC)	Provides assistance to low- to moderate income individuals and families living in northern Ontario who can be exposed to higher energy costs due to more severe winters and heavier reliance on more expensive home heating fuels. Qualifying individuals can receive up to \$151 for 2018 and families (including single parents) can receive up to \$232.
Low-Income Energy Assistance Program (LEAP)	Offers emergency financial assistance as on-bill assistance up to \$600 annually, special customer service rules, and energy conservation programs to qualifying electricity and natural gas consumers.

Residential Rate Mitigation – Existing Programs (cont'd)

Program	Description
Affordability Fund	Provides energy efficiency improvements to homes of Ontarians who do not qualify for low-income conservation programs, and who are unable to undertake energy efficiency improvements without support.
Save On Energy Home Assistance Program	Developed to help income-eligible consumers manage their electricity costs by providing home energy efficiency assessments and electricity savings measures at no cost. Measures include energy efficient appliances like refrigerators and window air-conditioners, programmable thermostats, weather-stripping services and insulation services.
Save on Energy for Home programs	Offered by local distribution companies and IESO, provide incentives and rebates for a variety of measures to help households become more energy efficient (e.g. Heating and Cooling Incentive for furnace and air conditioning rebates, Deal Days for instant discounts on a wide range of energy-efficient products like LEDs, power bars, dimmers and more).
Green Ontario Fund	The Green Ontario Fund, administered by MOECC, offers residential programs, such as GreenON Installations and GreenON Rebates, which help households increase the efficiency of their homes and reduce greenhouse gas emissions.

Commercial/Institutional Rate Mitigation – Existing Programs

Program	Description
Ontario Rebate for Electricity Consumers (OREC)	Provides a rebate equivalent to the provincial portion of HST, or 8%. Small businesses, farms and institutional consumers that are eligible for the OEB's RPP are eligible for OREC. Larger commercial consumers are not eligible for OREC.
Process and Systems Upgrade Initiative (PSUI)	Provides funding, tools, and resources to help organizations identify, implement, and validate energy efficiency projects from start to finish.
Save on Energy for Business	Offered by local distribution companies and IESO – offer distribution-connected customers financial incentives for audits, retrofits and process and systems improvements to help businesses manage their electricity use. Also provide incentives on-site energy managers, and energy management training.

Industrial Rate Mitigation – Existing Programs (cont'd)

Program	Description
Industrial Conservation Initiative (ICI)	Lowers costs for eligible large electricity consumers (i.e., those with monthly peak demand exceeding 1 MW, and manufacturers between 500 kW and 1 MW) that reduce consumption during peak periods. ICI consumers can reduce their electricity bills by up to one-third. ICI provides an electricity system benefit by reducing Ontario peak demand, which reduces the need for additional generation in the longer term.
Industrial Electricity Incentive (IEI)	Offers reduced electricity rates for companies starting or expanding operations in Ontario. To date, IESO has awarded 22 contracts to energy-intensive companies across the province through the program.
Northern Industrial Electricity Rate Program (NIERP)	Participants receive a rebate of two cents per kilowatt hour. On average, industrial electricity prices can be reduced by over 20% through the program.
Industrial Accelerator Program (IAP)	Assists eligible transmission-connected companies to fast track capital investment in major energy conservation projects. The program provides financial incentives to encourage investment in innovative process changes and equipment retrofits to reduce electricity consumption on the provincial system and to help companies become more competitive. Also provides incentives on-site energy managers. Distribution-connected sites of transmission-connected customers can also elect to participate in IAP.

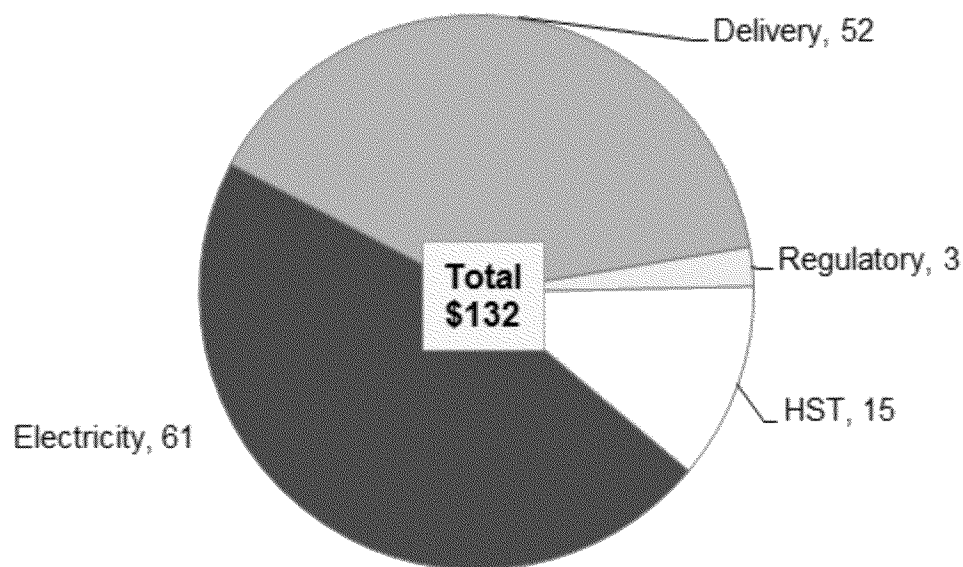
Appendix

Typical Residential Bill

- The following chart shows a typical residential bill as of May 1 2018.

Typical Residential Bill

750 kWh/month Consumption



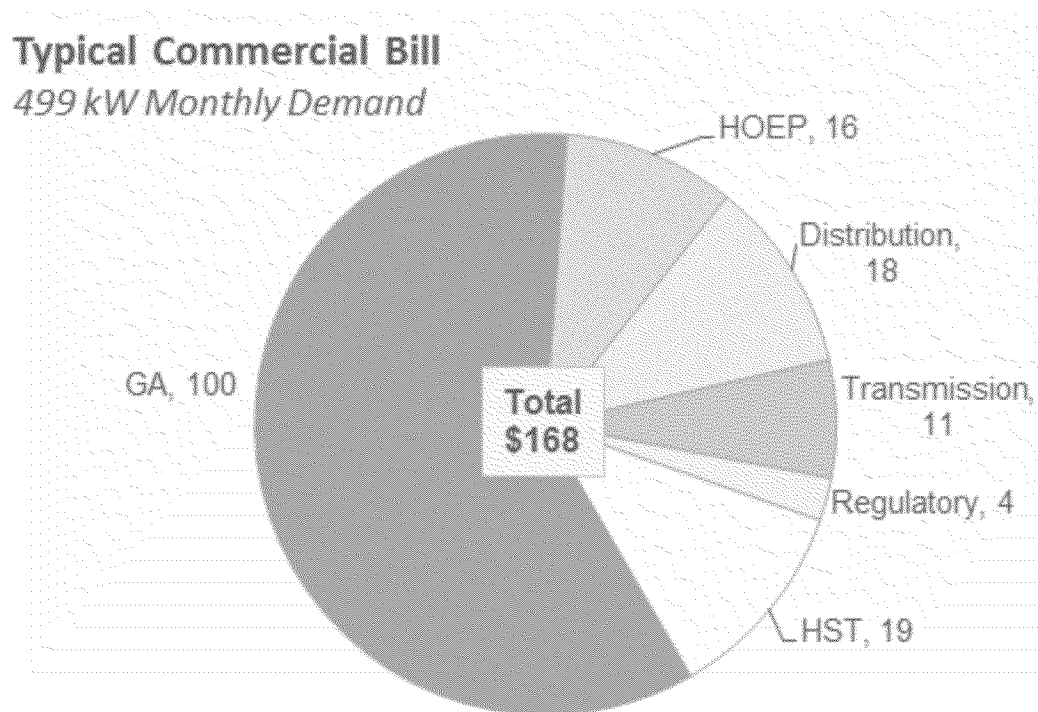
Note: The 8% OREC rebate further reduces the monthly bill by \$9 to \$123. Based on Toronto Hydro delivery rates. Delivery charges vary across Ontario.

Source: Toronto Hydro

Note: Sum of components do not add to the Total due to rounding.

Typical Commercial Bill (2017)

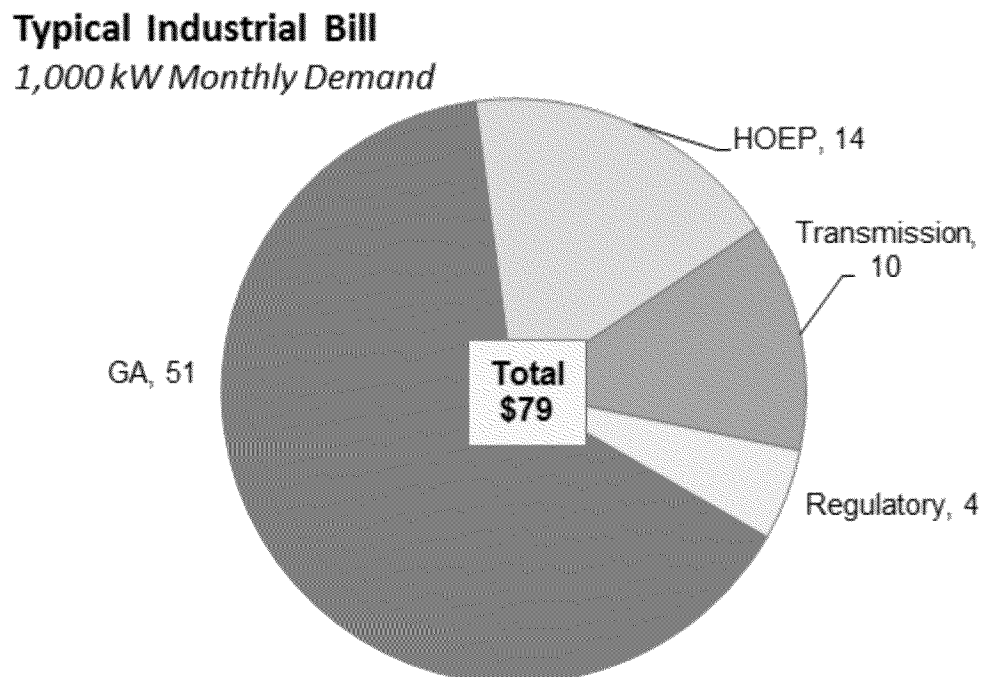
- The following chart shows a typical commercial consumer bill for 2017.



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. Based on Toronto Hydro delivery rates. Delivery charges vary across Ontario.

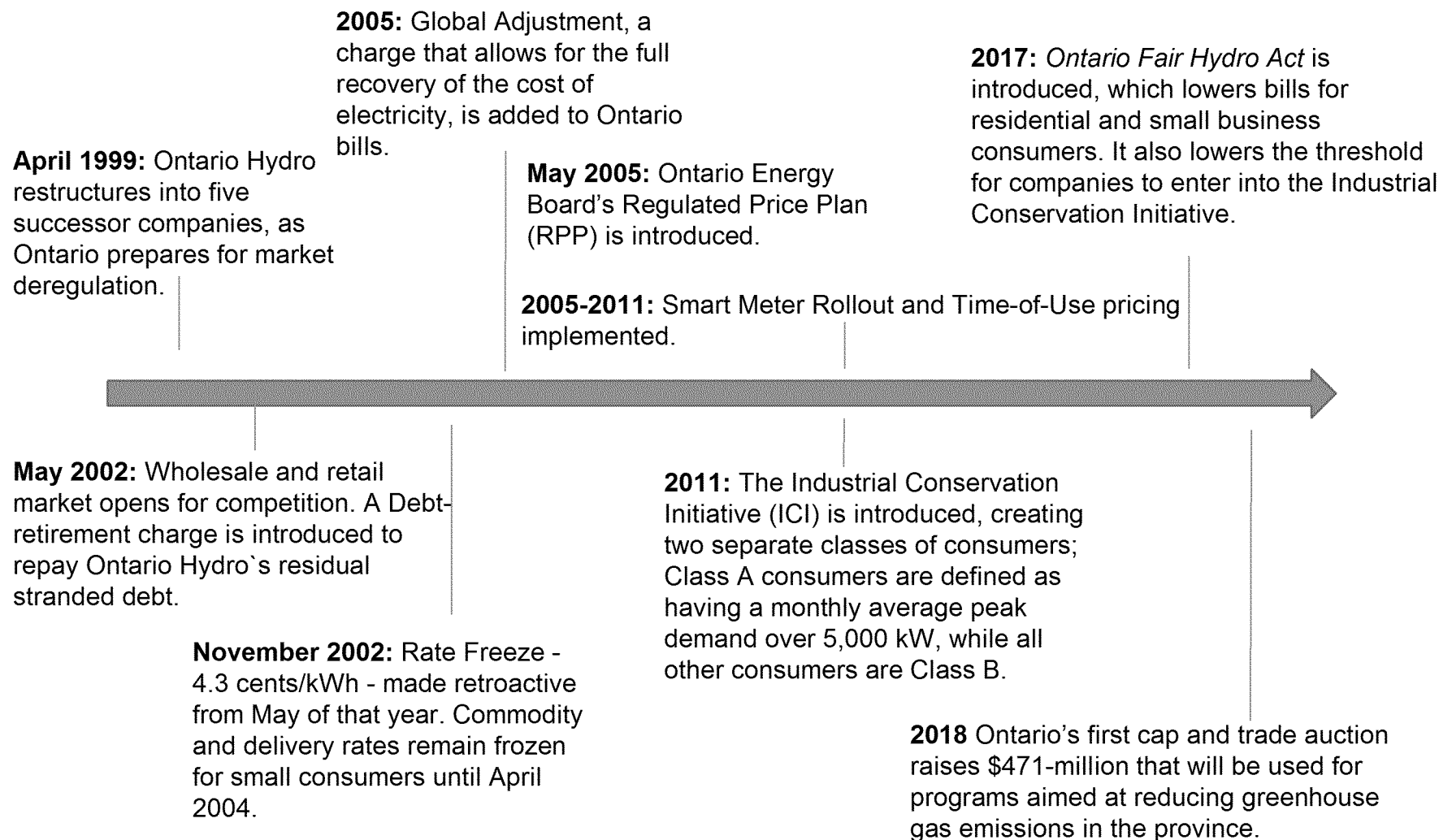
Typical Industrial Bill (2017)

- The following chart shows a typical industrial consumer bill for 2017.



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.

Historical Background – Key Events



Recent Trends

Behind-the-Meter Energy Storage in ICI

- Since 2017, three known ICI participants have installed electricity storage systems, or batteries, behind-the-meter (BTM) in order to save on electricity charges.
- Consumers in the ICI with a battery installed BTM can potentially avoid incurring global adjustment charges, as well as peak wholesale electricity charges, by withdrawing electricity stored in the battery during peak instead of from the grid.
- The total number of consumers in the ICI that have installed batteries BTM is not known, but widespread adoption amongst ICI consumers could potentially reduce system peak demand and shift global adjustment costs to other consumers.
- The ministry is monitoring battery adoption amongst ICI consumers, as well as its potential cost implications to consumers.