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IMPACT ON ELECTRICITY PRICES

QUESTION 8

How high are Ontario electricity prices?

From 2006 to 2016, average home electricity bills in Ontario increased 19%.

In 2016, before the Fair Hydro Plan, Ontarians had the highest electricity rates in Canada (though lower than some U.S. states and most of Europe). As of 2017, with the Fair Hydro Plan in place, Ontario residents began paying less than many Canadians in Atlantic Canada and in Saskatchewan. But only about 80% of the costs of operating the electricity system are being paid by today’s electricity customers; the remainder is funded through taxes or borrowed to be paid by future customers.

Overall Ontario home energy costs (including natural gas, and other fuels), are middle of the Canadian pack. This is because Ontarians rely less on electricity for water and space heating, and more on low-cost natural gas, than many other provinces. However, customers using electric resistance heating face high winter electricity costs.

How high are Ontario electricity prices?

Note to reader: To provide a comparison of apples to apples, all costs in this section are in real 2016 dollars (unless otherwise noted). This means that all prices have been adjusted to their 2016 value, which includes the impact of inflation. For example, something worth \$1 in 2006, would be adjusted to \$1.17, its value in 2016 real dollars.

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The details...

Electricity costs had to rise, and did

As discussed in [Q5](#), Ontario's electricity supply was stretched to its limits by the mid-2000s. By 2006, Ontario began to make its electricity system cleaner and more reliable, by making significant investments in new generation of all forms and conservation. As a result, electricity prices began to rise. The causes of these increases are discussed in [Q9](#).

From 2006 to 2016, Ontario's average unit cost of electricity (per kilowatt-hour (kWh)) increased by 45% (see Figure 8.1), from about 10 to 15¢/kWh.¹ This includes costs for:

- **generation** (building, operating and decommissioning power generation facilities)
- **transmission** (building, operating and maintaining high-voltage power lines and associated infrastructure)
- **distribution** (building, operating and maintaining low-voltage power lines and associated infrastructure)
- **wholesale market charge** (the cost to administer the electricity market and maintain the reliability of the grid)
- **conservation** (delivering electricity conservation programs, including incentives to participants and administration costs), and
- **debt retirement** (the cost of paying down the debt that Ontario Hydro built up before 2006).

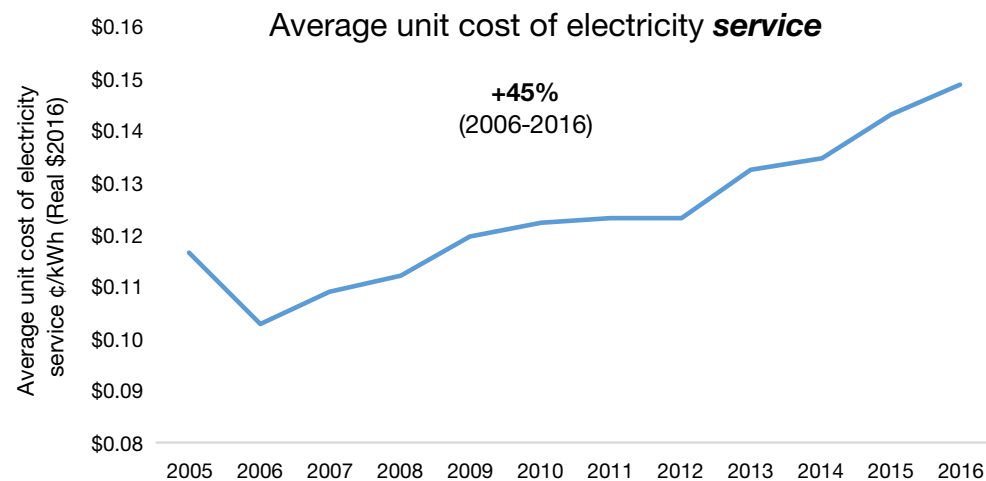


Figure 8.1. Average unit cost of Ontario's electricity system (2006-2016, real \$2016, ¢/kWh).

Note: Data represents true cost of service (total cost of electricity service divided by total Ontario electricity demand) and is not available prior to 2005. In 2005, unusual weather and tight supply conditions led to high demand and record market prices for electricity. Ontario demand peaked at 157 TWh, and Ontario was a net importer of electricity. By 2006, installed generation capacity had increased, and Ontario demand dropped by 6 TWh to 151 TWh. The cost of electricity declined and Ontario also returned to being a net exporter of electricity.

Source: Independent Electricity System Operator, information provided to the ECO in response to ECO inquiry (January 2018).

The rise in unit cost of electricity shown in Figure 8.1 (45% from 2006 to 2016) includes all costs of the system; however, residential bills have not increased at the same rate. Residential bills have declined both because of lower consumption (discussed below) and taxpayer subsidies (discussed later in the chapter). The bills paid by large businesses and industry are also different, and are discussed later in the chapter.

From 2006 to 2016 average Ontario home electricity bills increased by 19% (a rate of increase faster than the rest of Canada's).² As of 2017, primarily due to Ontario's Fair Hydro Plan, average Ontario home electricity bills were 13% lower than they were in 2006 (see Figure 8.2).

From 2006 to 2016, the rise in electricity costs was partly offset by a drop in average household electricity

The rise in electricity costs was partly offset by a drop in average household electricity use.

use,³ even though air conditioning use has grown.⁴ Conservation programs have helped, and buildings, equipment and appliances have become more energy efficient. Until 2009, the Ontario Energy Board defined the average Ontario household as using 1,000 kWh/month.⁵ In 2009, the board concluded that the average Ontario household used only 800 kWh/month. In 2016, the board decided that Ontario's typical residential electricity consumer now uses only 750 kWh/month.⁶ (For more on Ontario's changing electricity demand, see [Q3](#).)

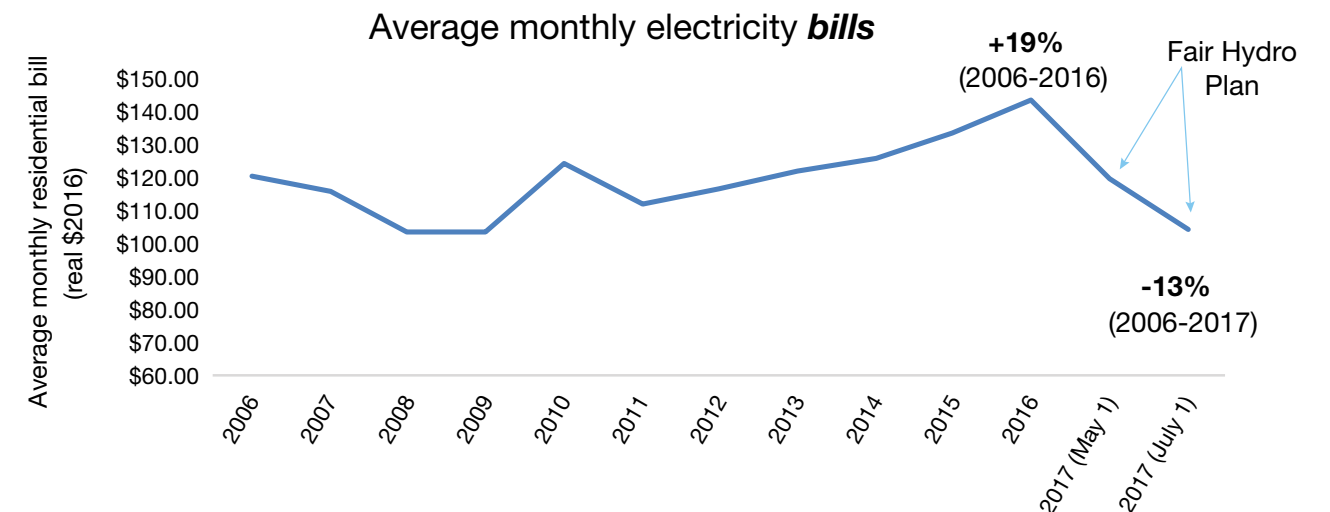


Figure 8.2. Changes in the average residential electricity bill (2006-2017, real \$2016, Ontario).

Note: Values are adjusted for inflation by the ECO via the Bank of Canada inflation calculator. The average electricity bill is based on average residential rate class consumption and the average of all local distribution company rates.⁷

Source: Ontario Energy Board, information provided to the ECO in response to ECO inquiry (January 2018).

Not everyone is “average”

Many consumers do not pay “average” bills, and many consumers do not have “average” electric consumption.

Different users may pay different rates. For example, distribution rates vary in different parts of the province. Many rural and on-reserve residents have historically paid higher than average delivery charges, but as of July 1, 2017, on-reserve First Nations customers receive a 100% credit to offset their delivery charges. As of July 1, 2017, many rural residents benefit from a lower maximum monthly base distribution charge.⁸

Some Ontario households use much more electricity than the “average” resident. For example, roughly 16% of homes rely on electric resistance heating, and some of those homes are in colder parts of the province where the need for heat is higher.⁹ Other residents may rely on electrically-powered medical equipment 24 hours a day.

Some Ontario households use much more electricity than the “average” resident.

Over the course of a year, a typical home heated by electric resistance (e.g., electric furnaces or baseboard heating) may use about three times more electricity than the same home using natural gas for space and water heating (see Figure 8.3).¹⁰ Since Ontario electricity is currently several times more expensive than natural gas for the equivalent amount of input energy (see Q15, Figure 15.6), electric resistance heating systems result in higher-than-average home energy bills during the coldest months of the year.¹¹ Electric heat pumps use only about half the electricity that electric resistance heating systems do, but still cost more for heating than natural gas at current prices.¹²

750 kWh (Natural gas heated)			2,400 kWh (Electric resistance heated)		
Your Electricity Charges			Your Electricity Charges		
Electricity			Electricity		
Off-Peak @ 6.5 ¢/kWh	31.69		Off-Peak @ 6.5 ¢/kWh	101.40	
Mid-Peak @ 9.5 ¢/kWh	12.11		Mid-Peak @ 9.5 ¢/kWh	38.76	
On-Peak @ 13.2 ¢/kWh	17.82		On-Peak @ 13.2 ¢/kWh	57.02	
Delivery	52.91		Delivery	95.66	
Regulatory Charges	3.28		Regulatory Charges	9.96	
Debt Retirement Charge	0.00		Debt Retirement Charge	0.00	
Debt Retirement Charge exemption saved you \$X.XX			Debt Retirement Charge exemption saved you \$X.XX		
Total Electricity Charges	\$117.81		Total Electricity Charges	\$302.80	
HST	15.32		HST	39.36	
8% Provincial Rebate*	(\$9.43)		8% Provincial Rebate*	(\$24.22)	
Total Amount	\$123.71		Total Amount	\$317.94	

Figure 8.3. Sample average monthly electricity bills for two types of urban residential consumers: (1) natural gas heated and (2) electric baseboard heated.

Note: The Ontario Energy Board uses 750 kWh to represent the average monthly residential Ontario electricity usage, while 2,400 kWh is an estimated monthly usage for an average size residence relying on electric resistance space and water heating. These bills incorporate rate reductions resulting from Ontario’s Fair Hydro Plan. Toronto Hydro Rates are used to represent typical urban delivery rates. The delivery charge does not reduce at the same rate as other line items because it includes both fixed and variable costs.

Source: Ontario Energy Board, Rate Calculator, online: <www.oeb.ca/consumer-protection/energy-contracts/bill-calculator> [Accessed 26 March 2018].

Energy poverty

For some consumers, high electricity consumption and high resulting costs can cause real hardship. Energy, or fuel, poverty is defined as residents who must spend more than 10% of their income on home energy.¹³ This ratio of energy costs to income can result in individuals having to make difficult decisions between energy and other life necessities (e.g., food, rent, clothing). Based on Ontario’s median income in 2015, average electricity and natural gas bills represent almost 3.5% of income.¹⁴ For a home heated by electric resistance, that would go up to

Low-income households are at greatest risk of energy poverty.

about 5%. According to 2015 data, Canada’s National Energy Board found 7% of Ontarians to be energy poor, compared to 13% in Atlantic Canada and 10% in Saskatchewan, and a Canadian-wide average of 8%.¹⁵

Low-income households are at greatest risk of energy poverty,¹⁶ often because they cannot afford to (or do not have the right to, if they are tenants) make their homes more energy efficient. As a result, these households are a priority for subsidized energy conservation programs. For this reason, low-income electricity and natural gas conservation programs do not need to meet as strict a cost-benefit test as most other conservation programs in Ontario. One example of a low-income electricity conservation program available to Ontario residents is the Home Assistance Program, which offers free basic energy efficiency upgrades for low-income residents, with deeper upgrades (such as home insulation) offered free of charge for electrically-heated homes. Gas utilities also offer conservation programs at no cost to low-income customers.¹⁷

Recommendation: To help people who are unduly affected by electricity rates, low-income and Aboriginal financial support programs should be supplemented with enhanced conservation programs to make electrically heated homes more efficient.

The province also provides rate relief to vulnerable electricity consumers through the Ontario Electricity

Support Program. Eligible applicants can receive monthly on-bill credits ranging from \$35 to \$75/ month. Households with greater electricity needs, such as electric heating, can receive an enhanced credit ranging from \$52 to \$113/month. This program was originally paid for through electricity rates, but is now being financed by taxpayers.¹⁸ For those residents that do not quite qualify for the Ontario Electricity Support Program, a \$100M Affordability Fund for free efficiency upgrades was set up as part of the Fair Hydro Plan.¹⁹

Where are we now? (2016-2017)

From 2015 to 2016, Ontario residents experienced a rate increase 2.5 times the national average.²⁰ In 2016, Ontario residential and large consumer costs per kWh were the highest in Canada.²¹

In 2017, Ontario introduced the Fair Hydro Plan, which reduced average electricity bills for residential and small business customers by 25%. This reduction was achieved in two stages. In January 2017, all electricity bills saw a rebate of 8%. In May 2017 and again in July 2017, further reductions as result of the Ontario Fair Hydro Plan combined with the 8% rebate, resulted in 25% lower bills for typical residential customers. Many small businesses and farms also benefitted.²² As of November 2017, based on a comparison of select cities, Ontario residents were no longer paying Canada’s most expensive electricity bills; Charlottetown, Regina and Halifax paid higher bills (see Figure 8.4). The Fair Hydro Plan is discussed further in Q13.

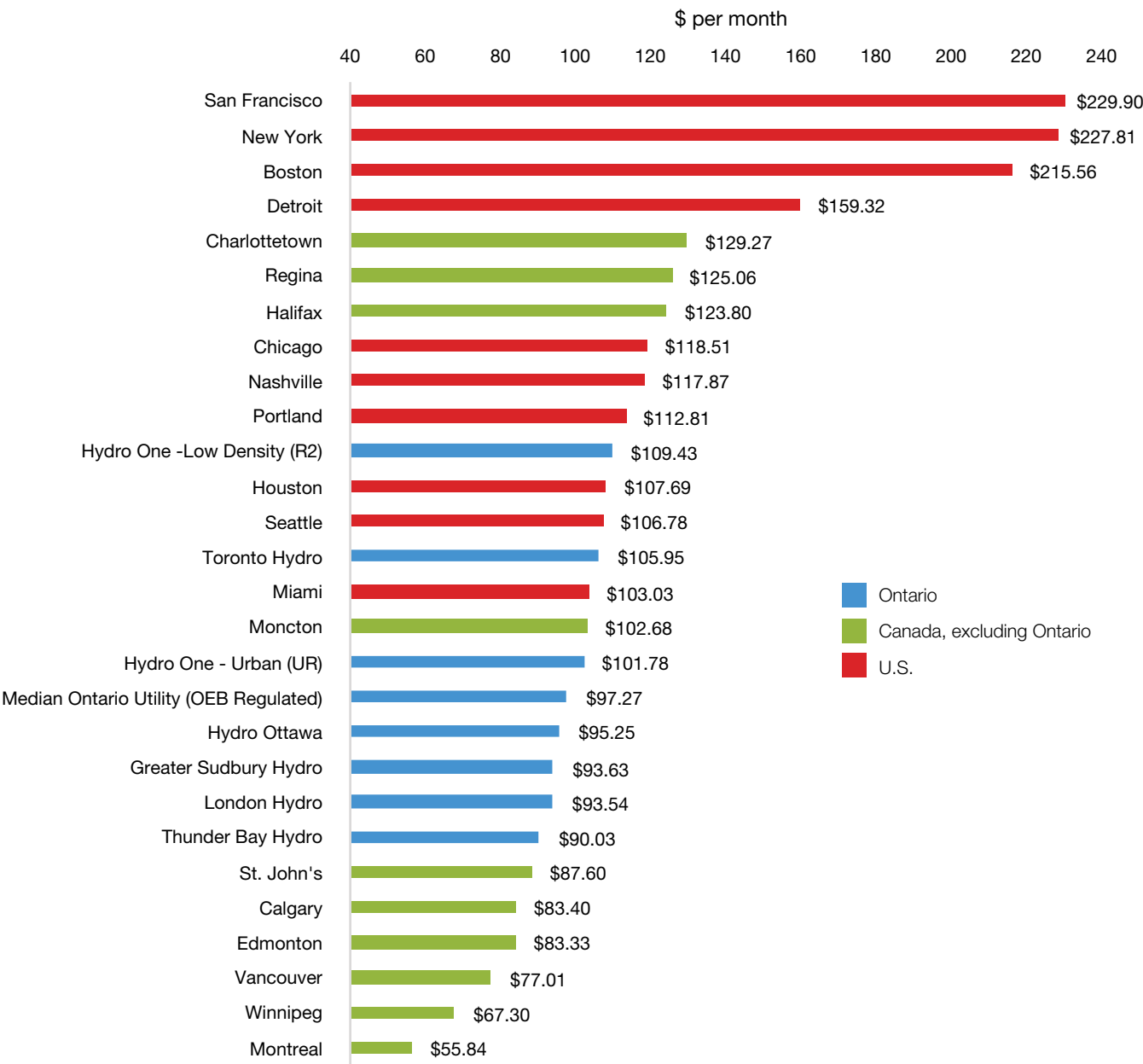


Figure 8.4. 2017 estimated total monthly residential bills (\$ before tax) in major North American cities (2017).

Note: The Ontario figures are based on electricity commodity prices (as of November 1, 2017) for the Regulated Price Plan, on time-of-use (TOU) rates, as well as the Ontario Energy Board rate database, while data for jurisdictions outside of Ontario is based on a 2017 Hydro-Quebec report. The Ontario figures in this chart assume a typical consumption pattern of 65% Off-Peak, 17% Mid-Peak and 18% On-Peak for each TOU period. 750 kWh is used as the monthly consumption of electricity in all selected jurisdictions.

Source: Electricity Rate Comparison", online: Ontario Energy Board <cf.oeb.ca/html/performance/rates_chart_US-CAN_totalbill.cfm>. [Accessed 26 March 2018]

Understanding your residential electricity bill

Figure 8.5 provides an example of the current format of a typical residential electricity bill in Ontario, including recent changes arising from the Ontario Fair Hydro Plan Act, 2017.²³ The bill calculation assumes monthly electricity use of 750 kWh and is for a customer on time-of-use (TOU) pricing.²⁴ Bills for users on tiered electricity rates or on contract with electricity retailers will look slightly different, as will bills for larger commercial and industrial customers.²⁵ Customers can visit the Ontario Energy Board's bill calculator (www.oeb.ca/consumer-protection/energy-contracts/bill-calculator) to generate a custom estimate based on where they live and the amount of electricity they use.

Electricity

The charge for resources used to supply electricity.²⁶ This charge is proportional to the amount of electricity used, and is the only part of the bill to which TOU pricing applies. TOU rates are regulated by the Ontario Energy Board and updated every 6 months on May 1 and November 1.²⁷ There are currently three TOU periods (on-peak, mid-peak, and off-peak) with different rates to reflect the fact that the cost to supply our electricity is higher at times of day when demand is high. The time slots change for summer and winter since consumption patterns are different in each season. TOU rates were reduced in July 2017 when the Fair Hydro Plan was implemented.

Delivery

The charge for delivering electricity from the generating station through high voltage (transmission) and low voltage (distribution) power lines to a customer.²⁸ Unlike electricity rates, which are identical across the province, delivery rates vary across local distribution companies depending on the age of a company's infrastructure, its service area's density and geography, and the ratio of residential to other customer classes.

SAMPLE MONTHLY BILL STATEMENT
Toronto Hydro-Electric System Limited - Main

Account Number:	000 000 000 0000
Meter Number:	00000000
Your Electricity Charges	
Electricity	
Off-Peak @ 6.5 ¢/kWh	31.69
Mid-Peak @ 9.5 ¢/kWh	12.11
On-Peak @ 13.2 ¢/kWh	17.82
Delivery	50.26
Regulatory Charges	3.28
Debt Retirement Charge	0.00
Total Electricity Charges	\$115.16
HST	14.97
8% Provincial Rebate*	(-\$9.21)
Total Amount	\$120.92

Figure 8.5. Sample monthly residential electricity bill (Ontario, 2017).

Regulatory Charges

Regulatory charges include the cost of Ontario's Independent Electricity System Operator to administer Ontario's electricity system, and other minor charges.²⁹

Debt Retirement Charge

The Debt Retirement Charge was charged to residential electricity consumers to help service and pay down the liabilities of the old Ontario Hydro.³⁰ As of December 2015, this charge has been removed from residential bills.³¹ The province has committed to remove it for all other electricity consumers by April 1, 2018.

Harmonized Sales Tax and the 8% Provincial Rebate

Electricity is subject to the Harmonized Sales Tax (HST). As of January 1 2017, the Ontario government provides an 8% rebate, equal to the provincial portion of this tax, on electricity bills.³² This is part of the current government's Fair Hydro Plan.

How does the global adjustment fit in?

When electricity prices are discussed, the global adjustment (GA) is often referenced, usually in contrast to the wholesale electricity price or hourly Ontario energy price (HOEP). The GA is a widely misunderstood term that shows up as a line item on large electricity consumer bills, but not on residential bills (where it is included within the category: electricity.)

Together, the wholesale electricity price (i.e., the HOEP) and the GA add up to the true cost of our electricity generation (but not transmission, distribution or regulatory charges). The distinction between them is a confusing result of the interaction between the spot (short-term) market for electricity, and the long-term contracts (and regulatory rate approvals) that get electrical supplies built. In other words, the GA is a non-intuitive way of slicing and dicing, then paying, what our electricity system costs.

When wholesale electricity prices are low, the GA automatically rises to make up the difference, and vice versa.

The wholesale electricity price is determined by the highest marginal cost generator accepted into the market. The GA includes whatever generation costs must be paid but are not covered by the wholesale electricity price. These generation costs cover all aspects of electricity generation, including operations and maintenance, construction, and administration. Today, wholesale electricity prices are often low because nuclear, wind, and solar have very low marginal costs of production; gas plants can also bid into the spot market at little more than their fuel price. This means that the GA now recovers the majority of generation costs.

A small portion of the GA also funds conservation programs; this portion of the cost does not fluctuate according to the commodity price.

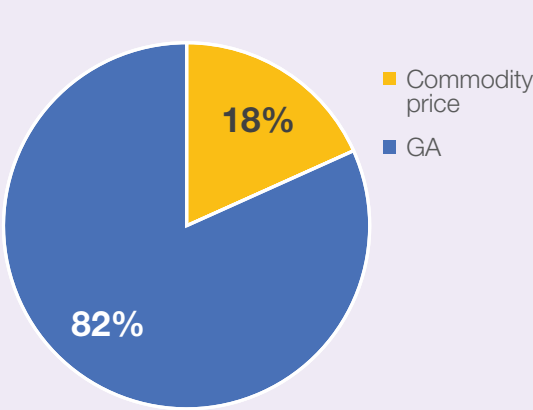


Figure 9.6. Share of electricity generation costs in Ontario (December 2017).

Source: "Global Adjustment", online: Independent Electricity System Operator <www.ieso.ca/power-data/price-overview/global-adjustment>. [Accessed 7 March 2018]

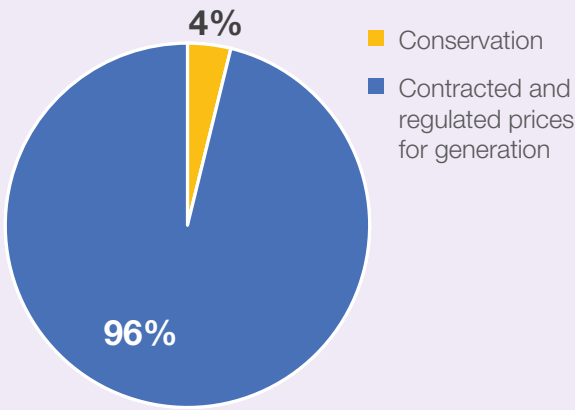


Figure 9.7. Elements of the global adjustment (December 2017).

Source: "Global Adjustment", online: Independent Electricity System Operator <www.ieso.ca/power-data/price-overview/global-adjustment>. [Accessed 7 March 2018]

For the sake of clarity and simplicity the term GA is avoided as much as possible throughout this report. For a more detailed explanation of the term, see section 2.7.4.2 of our 2014 Energy Conservation Report.

Overall home energy bills

Although Ontarians pay more for electricity than most of the rest of the country, average home energy bills (including electricity, natural gas, and other fuels) tell a somewhat different story. As the Financial Accountability Office of Ontario commented in 2016, "looking at how much households actually spend on energy in the home, rather than at prices alone, provides a clearer picture of how energy costs affect the cost of living of Ontarians."³³

Average Ontario home energy costs were in the middle of other Canadian provinces and territories.

As of 2015, average Ontario home energy costs were in the middle of other Canadian provinces and territories (see Figure 8.6).³⁴ This is partly due to the fact that Ontarians rely less on electricity for home heating and more on lower-cost natural gas than the Canadian average (see Figure 8.7).

In Q15 we discuss the relative price differential between electricity and natural gas, and how this affects fuel switching away from electricity and Ontario's climate change goals.

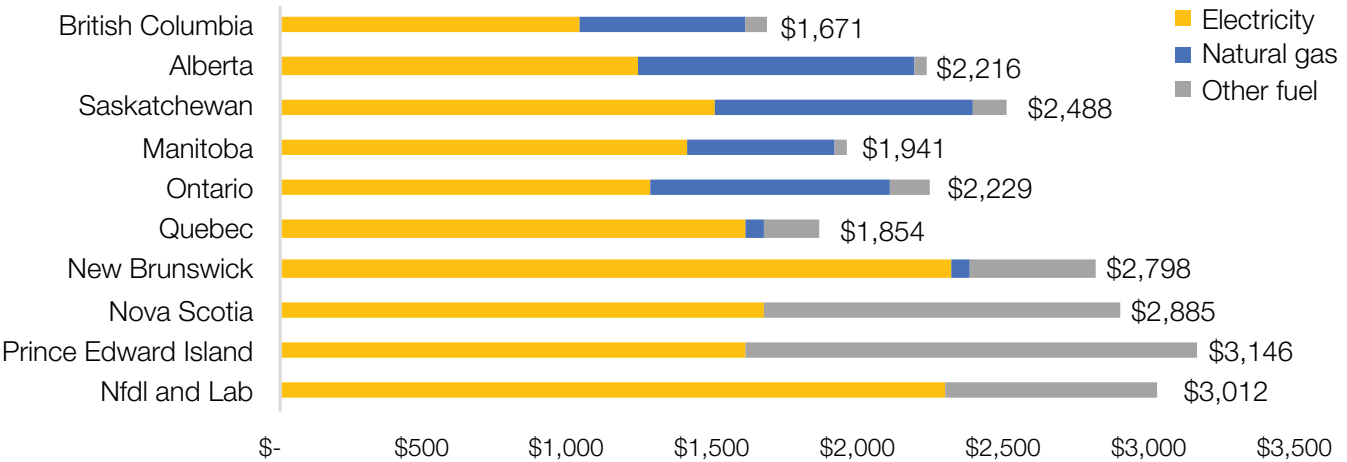


Figure 8.6. Provincial average annual home energy costs, by energy source (2015).

Note: Does not account for regional differences in after-tax income, or normalize for weather. Natural gas spending data for Newfoundland and Labrador, Prince Edward Island, and Nova Scotia was considered too unreliable to be published by Statistics Canada.

Source: Statistics Canada, Survey of Household Spending, Table 203-0021.

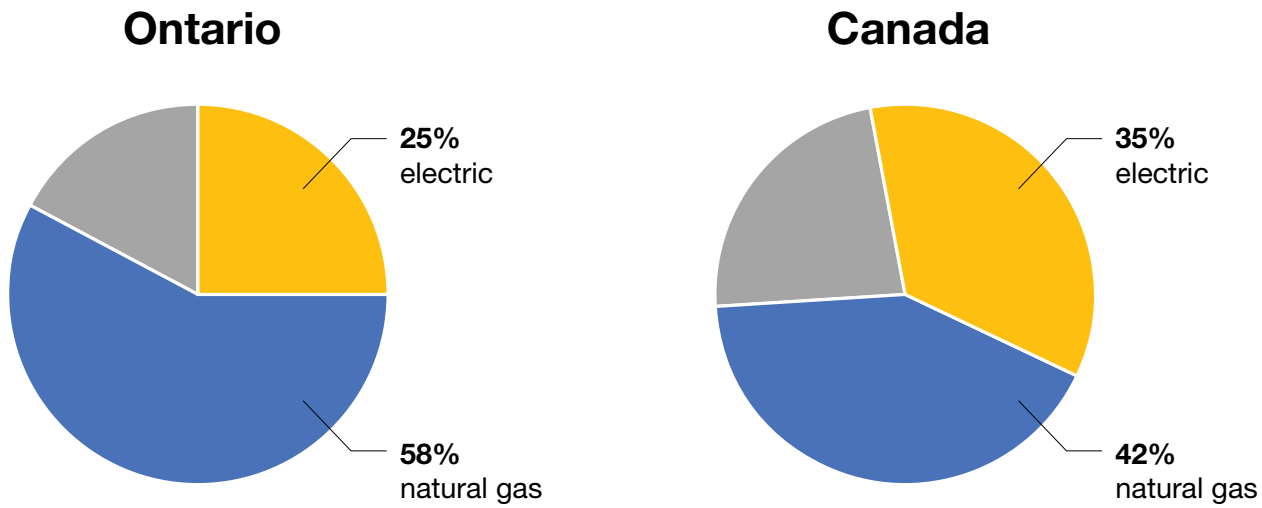


Figure 8.7. Share of space heating energy use supplied by natural gas, electricity and other fuels (including propane, oil and wood), Ontario vs. Canada, 2015.

Note: Canadian average does not exclude Ontario. Data does not normalize for weather.

Source: Natural Resources Canada, Comprehensive Energy Use Database, Residential Sector, Table 5: Space Heating Secondary Energy Use and GHG Emissions by Energy Source.

Businesses

Large power consumers are generally charged less for electricity than residential customers³⁵ (see Figure 8.8), and this is also true in Ontario. In some jurisdictions, industrial consumers have lower base electricity rates; in Ontario, they have preferential access to peak demand reduction and conservation programs that reduce their share of supply costs.³⁶

For those businesses that cannot benefit from the Industrial Conservation Initiative (ICI) program (the government estimates bill savings from this program to be about 33%³⁷), Ontario’s large-power consumers³⁸ pay more than their counterparts in any other Canadian

province. However, for those who participate in the ICI, Ontario industrial electricity rates are competitive.³⁹ By this metric, as of September 2017, Ontario’s northern industrial electricity rates were lower than in four other provinces, and Ontario’s southern industrial electricity rates were lower than in two provinces.⁴⁰

Several American states (e.g., Massachusetts and California) have higher prices per kWh for both residential and large customers (see Figure 8.8).⁴¹

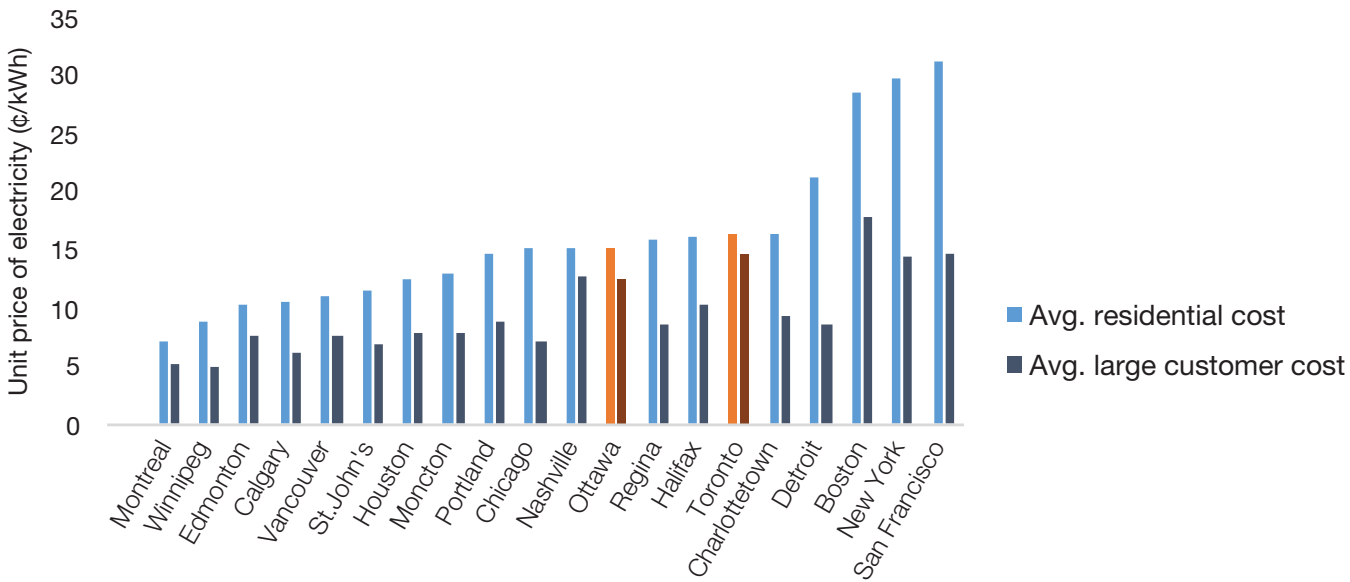


Figure 8.8. Average prices for residential and large power customers in major North American cities – not including any applicable discount programs (¢/kWh, rates in effect April 1, 2017).

Note: Residential prices are based on average bill for consumption levels of 1,000 kWh, not including taxes. Large customer prices are based on a monthly consumption of 3,060,000 kWh and a power demand of 5,000 kW. (For further details on methodology, see page 9 of the Hydro Quebec report). Prices do not include applicable discount programs, such as Ontario’s Industrial Conservation Initiative that can save large-power customers about 33% on their bills.

Source: Hydro Quebec, Comparison of Electricity Prices in Major North American Cities (Montreal: HQ, 2017) at 4-5.

Ontario’s economy grew steadily from 2006 to 2015⁴³ but shifted away from energy-intensive industrial and manufacturing sectors towards less energy-intensive industries, such as the service industry.⁴⁴ This shift in Ontario’s economy has been attributed to many factors, including the 2008 financial crisis, the cost and rigidity impacts of unionized workplaces⁴⁵ and increased competition from emerging markets.⁴⁶ Several studies have attempted to assess whether electricity rates have had an impact on Ontario’s industrial competitiveness, but have reached differing conclusions.⁴⁷

As of April 1, 2017, Ontario’s Fair Hydro Plan expanded coverage of the Industrial Conservation Initiative. This change enables smaller businesses to potentially reduce their electricity costs by reducing electricity consumption during peak times, an option which had previously only been available for larger businesses.⁴⁸

Electricity bills do not pay the whole cost

Although Ontario electricity bills are high, they are not high enough to pay the full cost of today’s electricity system. The unit cost of electricity shown in Figure 8.1 includes all costs of the system, but not all of these costs show up in customer bills. Some are paid for by taxes (i.e., subsidized by government funding).

The following electricity costs are paid for out of taxes (i.e., not through electricity rates):

- a rebate equivalent to the provincial portion of the HST for all residential, farm, small business and other eligible customers

Almost 20% of the current cost of electricity service is not paid by today’s electricity customers.

- subsidies for distribution rates for about 800,000 customers in rural and remote areas
- the Ontario Electricity Support program which provides rate relief to vulnerable customers
- an Affordability Fund for conservation measures for customers who are slightly above the low-income threshold, and
- the Northern Industrial Electricity Rate Program which reduces electricity rates for large industrial customers in northern Ontario.

Ontario’s 2017 budget includes an estimate of \$1.438 billion in 2017-18 spending on “electricity cost relief programs” (i.e., the first four items above), as well as \$120 million for the Northern Industrial Electricity Rate Program.⁴⁹

In addition, the province is borrowing an average of \$2.5 billion per year (to 2027) to reduce current electricity bills, to be repaid in future years.⁵⁰ Over the full period of the Fair Hydro Plan (through 2045), this borrowing will add roughly \$21 billion in extra interest charges to the cost of Ontario electricity (🔥 Q13).⁵¹

Putting these numbers together, we can estimate that almost 20% (\$4 billion out of \$21 billion) of the current cost of electricity service is not paid by today’s electricity customers through their electricity rates.

Conclusion

Ontario’s electricity rates have risen sharply since 2005. They dropped again following the introduction of the Fair Hydro Plan, partly because some electrical system costs are paid for through taxes, and some have been deferred until later. Rates are higher than in many Canadian and U.S. jurisdictions, but below several higher-cost North American locations, and most of Europe.

Average Ontario home energy costs are middle of the pack. This is due to higher than average use of low-cost natural gas for home heating; a trend that has steadily increased since 2006. It is important to note an important exception to this average: Ontarians dependent on electric resistance for home heating.

High electricity costs provide an incentive to reduce the use of electricity (especially during peak hours). But, such reductions may not be possible for the most vulnerable members of the population without government assistance. High electricity costs can also drive a switch to less expensive (but more carbon intensive) natural gas, where possible.

The next question will attempt to explain what has driven up electricity costs.

Endnotes

1. Values adjust for inflation (i.e., they are in 2016 real dollars). Were the year 2005 selected as a starting point rather than 2006, the increase would have been much smaller (only about 25%). Part of the reason for this unusual drop in electricity service cost between 2005 and 2006, is due to the fact that “unusual weather and tight supply conditions led to very high demand and record market prices for power, adding about \$3B to the cost of electricity.” (Independent Electricity System Operator, “Module 1: State of the Electricity System: 10-Year Review” (presentation, August 2016) slide 40.)
2. Ontario’s CPI for residential electricity bills increased at a similar rate to the rest of Canada between 2000 and 2009, after which it accelerated so that by 2016 it was 45% higher. As a general rule, Ontario and the rest of Canada experience similar increases in their CPI for a representative basket of goods and services, of which electricity is only one of several dozen items. (Statistics Canada, Consumer Price Index, Table 326-0020; Statistics Canada, Gross Domestic Product, Expenditure-Based, Provincial and Territorial, Table 384-0038.)
3. Independent Electricity System Operator, “Module 1: State of the Electricity System: 10-Year Review” (presentation, August 2016) slide 9.
4. Ontario Power Authority, “Ontario Electricity Demand 2012 Annual Long Term Outlook” (presentation, 2012) slides 14-15, 21, 22, online: <cms.powerauthority.on.ca/sites/default/files/news/Q2-2012LoadForecast.pdf>.
5. Ontario Energy Board, Defining Ontario’s Typical Electricity Consumer, EB-2016-0153 (Toronto: OEB, 14 April 2016) at 2.
6. Ibid, at 1.
7. As set at the beginning of the rate year (Jan 1 or May 1, depending on each distribution company’s rate year). The percentage of consumption during time-of-use periods is assumed to be as follows:

	2012-2016	2017
off peak	64%	65%
mid peak	18%	17%
on peak	18%	18%
8. Ontario Energy Board, News Release, “The Fair Hydro Act, 2017” (15 June 2017), online: <www.oeb.ca/newsroom/2017/fair-hydro-act-2017>.
9. Across Canada 38% of households are heated by electricity, and 43% by natural gas, compared to Ontario where 16% of households are heated by electricity and 66% by natural gas (Natural Resources Canada, Survey of Household Energy Use 2011 (Ottawa: NRCAN, 2014) at Table 6.1); The general trend of this survey data is supported by more current data which states that in 2015, residential sector space heating in Ontario was provided by 25.5% electricity and 58.1% natural

gas, and in Canada was 35% electricity and 42% natural gas (Natural Resources Canada, Comprehensive Energy Use Database, Residential sector: Ontario, Table 5: Space Heating Secondary Energy Use and GHG Emissions by Energy Source); The Toronto Atmospheric Fund estimates that almost 24% of multi-unit residential buildings (MURBS) in Ontario are heated with electricity, and that MURBs have the highest portion of electric heating of the residential sector. (Toronto Atmospheric Fund, Pumping Energy Savings: Ontario EMURB Market Characterization Study (Toronto: TAF, February 2016) at ii).

10. The Ontario Energy Board uses 750 kWh to represent the average monthly residential Ontario electricity usage for all homes. Enbridge reports that a typical residential customer uses about 2,400 cubic metres of natural gas a year for home and water heating. Assuming gas space and water heating efficiency of about 80%, it would take about 1,650 kWh/month to heat the same typical home using electric heat. By adding this heating load to the average OEB monthly electricity usage, this results in a total electricity bill of approximately 2,400 kWh. This is about 3.2 times as much electricity as the OEB average. (Enbridge, “Your Energy Dollars Go Further with Natural Gas”, online: <www.enbridgegas.com/homes/accounts-billing/residential-gas-rates/natural-gas-provides-great-value.aspx>.)
11. A customer heating with natural gas would use roughly 200 m3 of natural gas and 750 kWh of electricity per month, averaged over the year. According to the OEB’s rate calculator, this customer’s average Enbridge natural gas bill would be \$89.78, and their average Toronto Hydro electricity bill would be \$123.71 (as of 28 March 2018), for a total of \$213.49. A customer heating with electric resistance heating would use roughly 2,400 kWh of electricity per month, averaged over the year, which would cost \$317.94 (49% more than the combined energy bill for the customer heating with natural gas). Of course, this extra cost would not be spread evenly over the course of the year, but would be concentrated in the winter months.
12. Ontario Energy Board, Marginal Abatement Cost Curve for Assessment of Natural Gas Utilities’ Cap and Trade Activities by ICF (EB 2016-0359) (Toronto: OEB, 20 July 2017) at A-3.
13. Government of Canada, National Energy Board, Market Snapshot: Fuel poverty across Canada – lower energy efficiency in lower income households (30 August 2017), online: <www.neb-one.gc.ca/nrg/ntgrtd/mrkt/snpshst/2017/08-05flpvt-eng.html?=&wbdisable=true>; Contra, the Fraser Institute, which uses 10% of total expenditures as its definition for energy poverty, on the basis that total expenditure is more accurately reported than income (Energy Costs and Canadian Households (Fraser Institute, 2016) at 13, online: <www.fraserinstitute.org/sites/default/files/energy-costs-and-canadian-households.pdf>).
14. Statistics Canada, 2016 Census of Population. Statistics Canada. 2017. Various geographies. Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released September 13, 2017.

Ontario median annual income	Ontario median monthly income	Avg. monthly residential electricity bill (750 kWh, Toronto Hydro)	Avg. monthly residential natural gas bill (200 m³, Enbridge)	Avg. monthly electricity & natural gas bill
\$74,287	\$6,191	\$123.71	\$89.78	\$213.49
(per Stats Can, 2015)		(per OEB Bill Calculator, March 2018)		3.5% of \$6,191

15. Government of Canada, National Energy Board, Market Snapshot: Fuel poverty across Canada – lower energy efficiency in lower income households (30 August 2017), online: <www.neb-one.gc.ca/nrg/ntgrtd/mrkt/snpst/2017/08-05flpvt-eng.html?=&wbdisable=true>.

16. Ibid; Energy Costs and Canadian Households (Fraser Institute, 2016) at 19, online: <www.fraserinstitute.org/sites/default/files/energy-costs-and-canadian-households.pdf>.

17. The Ministry of Energy has recently directed the Independent Electricity System Operator to improve access to low-income electricity conservation programs across the province. (Directive from Ontario Minister of Energy to the Independent Electricity System Operator, Re: 2015-2020 Conservation First Framework (4 August 2017), online: <www.ieso.ca/-/media/files/ieso/document-library/ministerial-directives/2017/directive-cff-partnering-green-ontario-fund-cdm-programs-20170804.pdf?la=en>.)

18. Ontario Energy Board, Ontario Electricity Support Program, Questions and Answers, online: <ontarioelectricitysupport.ca/FAQ?lang=en>. [Accessed 22 November 2017]

19. Ontario government, News Release, “Ontario Launches New Program to Help Reduce Electricity Costs” (24 October 2017), online: <news.ontario.ca/mei/en/2017/10/ontario-launches-new-program-to-help-reduce-electricity-costs.html>.

20. Fraser Institute, Evaluating Electricity Price Growth in Ontario (Toronto: Fraser Institute, 2017) at 3.

21. Hydro Quebec, Comparison of Electricity Prices in Major North American Cities, Rates in effect April 1, 2016 (Montreal: HQ, 2016) at 4 (average price for residential customers assuming a monthly consumption of 1,000 kWh), at 5 (large-power customers are those that have a power demand of 5,000 kW or more, and are assumed to consumer 3,060,000 kWh/month).

22. Ontario Energy Board, News Release, “The Fair Hydro Act, 2017” (15 June 2017), online: <www.oeb.ca/newsroom/2017/fair-hydro-act-2017>.

23. The format of Ontario electricity bills is specified by regulation (Information on Invoices to Low-Volume Consumers of Electricity, O Reg 275/04). This regulation sets up the different headings that appear on an electricity bill and explains what charges/costs will be included under those headings.

24. Roughly 91% of eligible customers. (Ontario Energy Board, Monitoring Report: Smart Meter Deployment and TOU Pricing – August 2012 (Toronto: OEB, 17 October 2012), online: <www.oeb.ca/oeb/Documents/SMdeployment/Monthly_Monitoring_Report_August2012.pdf>.)

25. Instead of the three different electricity rates based on time-of-use periods (“off-peak”, “mid-peak”, “on-peak”), the small number of customers on tiered rates will see two rates, one for electricity use below a threshold (600 kWh in the summer, 1000 kWh in the winter), and a second (higher) rate for electricity use above this threshold. Customers on retail contracts will see the “Electricity” portion of their bill split into two items - the electricity rate set as per their contract, plus a line for “Global Adjustment” costs that account for many of the costs.

All customers pay the Global Adjustment, but for residential and small business customers on tiered or time-of-use rates, the Global Adjustment is already embedded in these rates and not displayed separately. Medium and large customers such as commercial,

institutional and industrial facilities will also see the Global Adjustment as a separate line item on the bill. These costs now account for the majority of the “Electricity” portion of the bill.

26. This charge also includes the cost of conservation programs, which make up a very small share of the charge.

27. Tiered rates are also regulated. Retailer rates, on the other hand, are not regulated by the OEB and are set out in the energy contract signed between the customer and the retailer, although the OEB provides consumer protection oversight.

28. The delivery charge includes:

- a customer service charge from LDCs to operate meter readings and customer service
- transmission charges from Hydro One to operate and maintain their transmission lines, and
- a line loss charge to account for the electricity lost during transmission and distribution.

All these charges require OEB approval.

29. The regulatory charge also covers renewable connection costs from LDCs and the Standard Supply Service Charge which is an administrative charge approved by the OEB for customers that buy electricity directly from LDCs. As of June 1, 2017, some of the Rural and Remote Electricity Rate Protection (RRRP) and all of the Ontario Electricity Support (OESP) charges were removed from this line item and moved to the tax base.

30. As of March 31, 2017, total debt and liabilities that still have to be repaid were \$21.1 billion. However, unfunded liabilities were only \$3.2 billion. The Ontario Electricity Financial Corporation will use other revenue sources to pay down the remaining debt once the Debt Retirement Charge is removed from all electricity bills. (Ontario Electricity Financial Corporation, Debt Management, online: <www.oefc.on.ca/debtmanage.html>.)

31. Ontario Ministry of Finance, Debt Retirement Charge – General Information, online: <www.fin.gov.on.ca/en/guides/drc/101.html>.

32. Ontario Government, News Release, “Ontario Passes Legislation to Reduce Electricity Costs for Families and Businesses” (19 October 2016) online: <news.ontario.ca/mei/en/2016/10/ontario-passes-legislation-to-reduce-electricity-costs-for-families-and-businesses.html>.

33. Financial Accountability Office of Ontario, Home Energy Costs (Toronto: FAO, 25 August 2016) at 1, online: <www.fao-on.org/en/Blog/Publications/home_energy>.

34. Although the results of this survey are only *indicative* of actual costs due to methodological limitations (i.e., sample size and accuracy of responses), the results do reflect the home space heating profiles of average Ontarians.

35. Most jurisdictions are strongly motivated to attract and keep large businesses for employment and tax reasons, and they can be proportionately less expensive to serve than households.

36. Specifically, their share of the “global adjustment”, a portion of electricity costs which covers the costs for contracted generating resources that are not recovered from the commodity price alone, as well as a very small amount for conservation programs.

37. Ministry of Energy, News Release, “Backgrounder: Ontario’s Industrial Conservation Initiative (ICI)” (15 September 2016) online: <news.ontario.ca/mei/en/2016/09/ontarios-industrial-conservation-initiative-ici.html>.

38. Here ‘large power consumers’ is a term borrowed from the referenced Hydro Quebec report, where it is defined as consumption over of 3,060,000 kWh and a power demand of 5,000 kW. In Ontario, residential customers are those with a peak demand of less than 50 kW, any peak demand above that is considered to be a Class B customer, and any commercial or institutional customer with a peak demand above 1,000 kW, or industrial customer with a peak demand of 5,000 kW or greater is eligible to register as a class A consumer under the Industrial Conservation Initiative (ICI).

39. Ministry of Energy, Ontario Energy Report, Q3 2017 at 15, online: <www.ontarioenergyreport.ca/pdfs/6188_IESO_Q3OER2017_Electricity_EN.pdf>.

40. Ontario Energy Report, Q3 2017 (Toronto: IESO, 2017) at 15, online: <www.ontarioenergyreport.ca/pdfs/6188_IESO_Q3OER2017_Electricity_EN.pdf>.

41. Hydro Quebec, Comparison of Electricity Prices in Major North American Cities (rates in effect April 2017) (Montreal: HQ, 2017) at 4, 26.

42. Many large-power customers in Ontario participate in the Industrial Conservation Initiative (ICI) conservation program, which substantially lowers their electricity bills. These cost reductions (and any cost reductions from optional programs) are not reflected in the chart.

43. As evidenced by total expenditure based GDP:

Provincial and Territorial Gross Domestic Product by Income and by Expenditure Accounts – 1902 (Final consumption expenditure)										
ONTARIO Chained (2007) dollars	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
	\$438,080	\$450,039	\$464,401	\$466,543	\$482,061	\$489,514	\$495,041	\$501,462	\$513,272	\$526,388

(Statistics Canada: Table 384-0038 Gross domestic product, expenditure-based).

44. Ontario’s service industry went from represent 74% of the province’s GDP in 2007 to 77% of the GDP in 2015, whereas Ontario’s industrial sector went from 20% to 15%, the manufacturing sector went from 16% to 12%, and its goods producing sector went from 26% to 22.5%. (Statistics Canada, CANSIM table 379-0028: Gross Domestic Product (GDP) at basic prices, by North American Industry Classification System (NAICS).)

45. Ontario Ministry of Finance, Ontario’s Long-Term Report on the Economy (Toronto: Ministry of Finance, 2017) at 103-105.

46. Emily Capeluck, Explanations of the Decline in Manufacturing Employment in Canada (Centre for the Study of Living Standards, October 2015) at 31, online: <www.csls.ca/reports/csls2015-17.pdf>.

47. A 2017 Fraser Institute study argued that high electricity prices may be to blame (at least in the electricity-intensive steel and paper manufacturing sectors) for the fact that manufacturing jobs in Ontario did not recover after the 2008 recession at the same pace as neighbouring jurisdictions. The study’s findings are based on two key assumptions: (1) applicable industrial electricity rates, and (2) applicability of findings from a 2013 American study (regarding the elasticity of employment in certain U.S. industries to energy prices). The latter does not account for Ontario-

specific and more recent socio-political trends that may have affected job losses in these sectors. It is also unclear whether the assumption made about applicable industrial electricity rates is appropriate for Ontario’s steel and paper industries. The study assumes an average between class A and class B industrial rates. However, companies in these industries are likely to fall primarily in class A, which has lower rates. (Ross McKittrick and Elmira Aliakbari, Rising Electricity Costs and Declining Employment in Ontario’s Manufacturing Sector (Toronto: Fraser Institute, October 2017) at 25-27); Another report published in 2017 by McMaster University’s Automotive Policy Research Centre concluded that Ontario’s automotive industry has not seen its competitiveness with North America’s top 10 leading car-manufacturing jurisdictions impacted by the rising cost of electricity. (Greig Mordeu and Kelly White, Electricity Pricing in Ontario and its Effect on Competitiveness: an Automotive Manufacturing Case Study (Hamilton: Automotive Policy Research Centre, March 2017) at 14).

48. The ICI was extended to consumers with a peak demand of 1 MW to 500 kW in targeted manufacturing and industrial sectors (including greenhouses). (Independent Electricity System Operator, Conservation E-Blasts: Industrial Conservation Initiative (3 May 2017) online: <www.ieso.ca/sector-participants/conservation-delivery-and-tools/conservation-e-blasts/2017/05/industrial-conservation-initiative-update>.)

49. Ministry of Finance, 2017 Ontario Budget: Budget Papers (Toronto: Ministry of Finance, 2017) at 23, 240, online: <www.fin.gov.on.ca/en/budget/ontariobudgets/2017/budget2017.pdf>.

50. Financial Accountability Office of Ontario, An Assessment of the Fiscal Impact of the Province’s Fair Hydro Plan (Toronto: FAO, Spring 2017) at 4, online: <www.fao-on.org/web/default/files/publications/Fair%20Hydro/Fair%20Hydro%20Plan.pdf>.

51. Ibid, at 1.