
Electricity Pricing in Ontario

Draft
2016-10-11

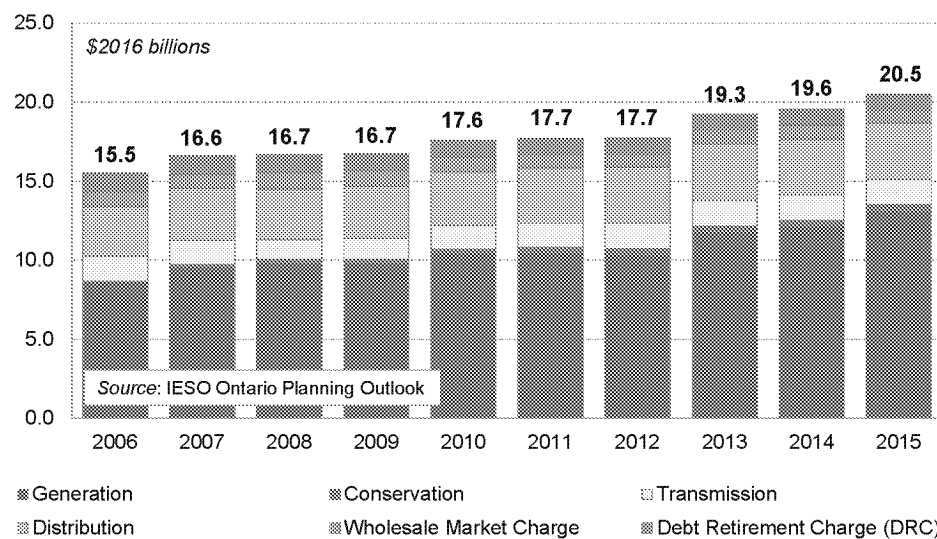
CONFIDENTIAL DRAFT

Investing in Ontario's Electricity System

- Since 2003, significant investments have been made in Ontario's electricity system.
 - About **\$35 billion has been invested** in modernizing and rebuilding **16,000 megawatts (MW)** of new, cleaner power for Ontario – that's **40% of our current supply**.
 - The province has approximately **15,800 MW** of wind, solar, bioenergy and hydroelectricity energy online, including more than **4,300 MW of wind capacity** from more than **2,000 wind turbines**.
 - Ontario has the most solar photovoltaic (PV) capacity of any jurisdiction in Canada with over **2,100 MW** online.
 - More than **\$13 billion** has been invested to enhance and renew Hydro One's systems, including upgrades to over **11,000 kilometres of power lines** (including both transmission and distribution lines).
 - In 2014, Ontario became the first jurisdiction in North America to eliminate coal as a source of electricity generation. Replacing coal-fired electricity generation is the single largest climate change initiative undertaken in North America – the equivalent to taking up to 7 million cars off the road.

Trends in Electricity Cost – Last 10 Years

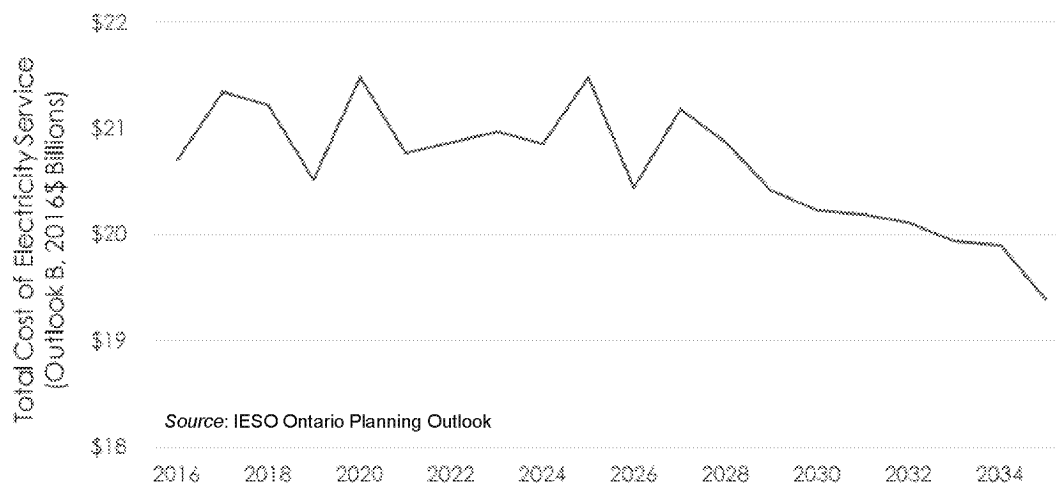
- Total cost of electricity grew 3.2% per year (on average) from 2006 to 2015 in real 2016\$.



Bending the Cost Curve

- Ontario has taken action to reduce electricity costs for families, farms and businesses. Actions taken so far include:
 - Renegotiating the Green Energy Investment Agreement (GEIA) with Samsung, reducing contract costs by \$3.7 billion.
 - Deferring the construction of two new nuclear reactors at Darlington, avoiding an estimated \$15 billion in new construction costs.
 - Starting Bruce refurbishments in 2020, instead of 2016, thus helping to achieve \$1.7 billion in savings relative to the 2013 Long-Term Energy Plan (2013 LTEP) forecast and by continuing to operate Pickering up to 2024, pending regulatory approvals, which could save ratepayers as much as \$600 million.
 - Reducing Feed-In Tariff (FIT) prices through annual price reviews, saving ratepayers at least \$1.9 billion.
 - Introducing strong competition between developers of large renewable projects through the Large Renewable Procurement (LRP) process to drive down price. As a result of lower prices and revised procurement schedules, LRP I costs were approximately \$1.5 billion lower than the 2013 LTEP forecast.
 - Suspending the second round of the Large Renewable Procurement (LRP II) process and the Energy-from-Waste Standard Offer Program is expected to save up to \$3.8 billion in costs relative to the LTEP 2013 forecast.

Projected Cost of Electricity Service 2016-2034



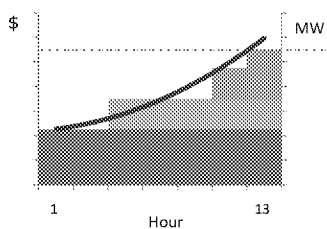
Overview of Electricity Pricing in Ontario

- Electricity pricing is generally based on a the principle of full cost recovery. Payments to the province's generation fleet are recovered as they are incurred.
- Prior to 2002, consumers were charged a fixed price per kilowatt hour (kWh) that bundled together generation, transmission and distribution costs.
- Today, bills break out the costs for generation, transmission and distribution; in general, prices reflect the cost to produce and deliver electricity.
- For the past several years, electricity prices have increased at a faster pace than the consumer price index as significant costs have been incurred to update generation, transmission and distribution infrastructure.
- Further price increases are expected in the short term as additional renewable projects come on-line and nuclear units are refurbished.
- In the medium to longer term, prices are expected to remain relatively flat.

Dispatching Generation

Step 1:

Generators, along with imports, offer quantities of power into the Ontario electricity market at prices that generally reflect their short-run operating costs (e.g., fuel).



Step 2:

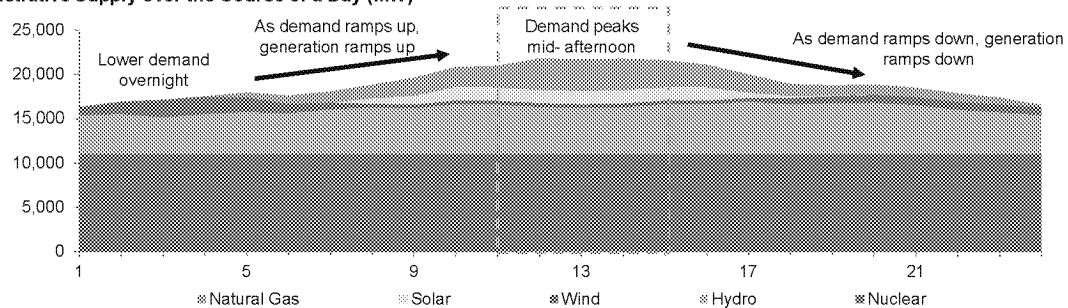
IESO arranges offers in order from least expensive to most expensive, forming an offer stack.

Step 3:

The offer corresponding to the generator in the stack that meets the last unit of demand sets the Market Clearing Price every 5 minutes. The average of the 12 hourly MCPs is the Hourly Ontario Energy Price, or HOEP.

Generators receive revenues from the market through HOEP based on each MWh of generation.

Illustrative Supply over the Course of a Day (MW)

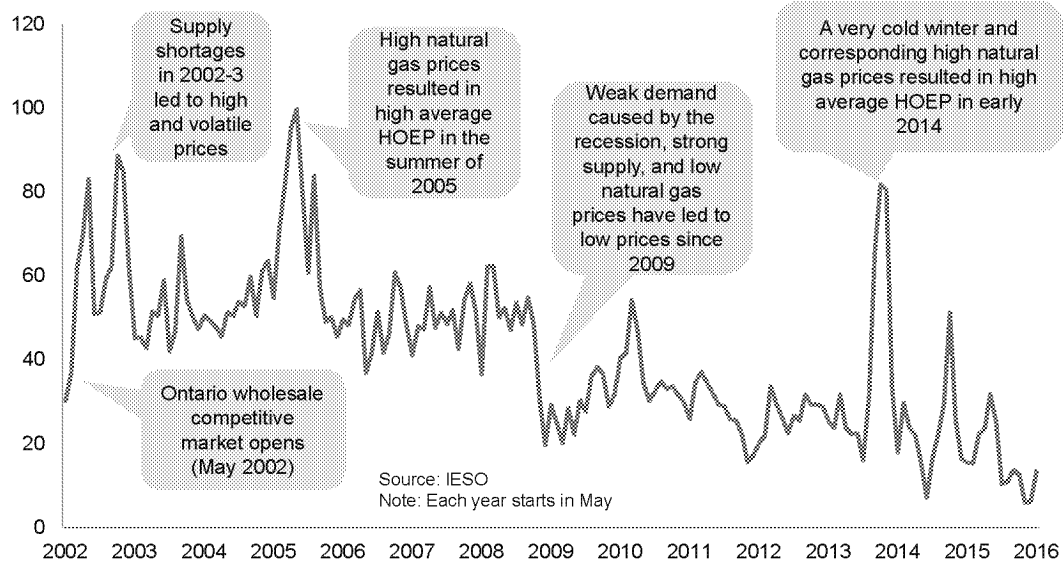


Hourly Ontario Energy Price (HOEP)

- HOEP is the hour-by hour market clearing price that reflects the short term cost of producing power.
 - HOEP generally reflects the marginal cost of electricity generation in the province.
- HOEP is determined by supply and demand conditions in the wholesale market.
- All generators receive HOEP for the electricity they supply.
- HOEP is included in the Electricity line on the bills of most residential and small business consumers. HOEP is a separate line on bills for larger commercial and industrial consumers.

Historical Market Prices

Weighted Monthly Average Hourly Ontario Energy Price (\$/MWh)

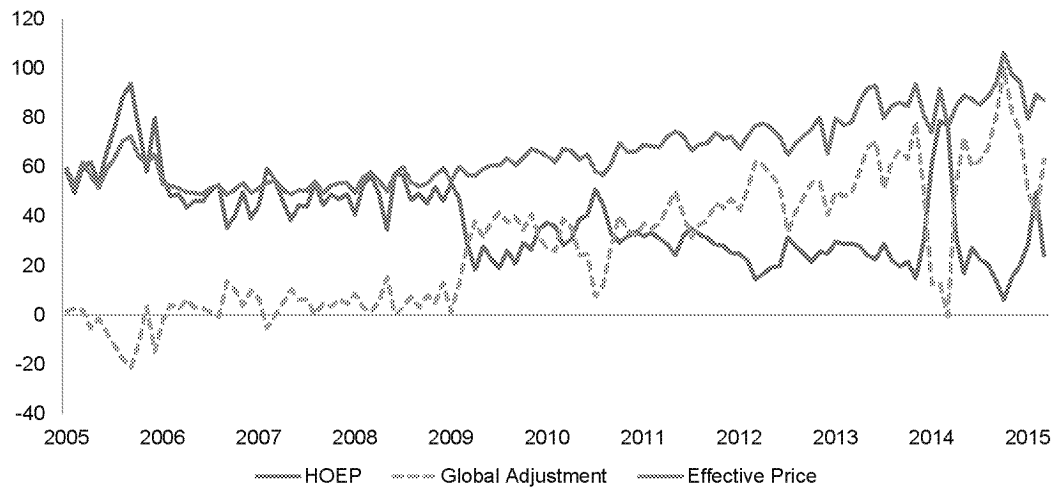


Global Adjustment (GA)

- The GA is a variable monthly charge and cost recovery mechanism used in Ontario's electricity market.
- The GA was introduced in 2005 to support the move to long-term contracting with generators. This was necessary in order to attract much needed investment in Ontario's electricity generation sector.
- All customers pay GA. Costs that go into GA include:
 - The Independent Electricity System Operator (IESO) contract costs: Clean Energy Supply contracts (i.e., natural gas), Renewable and Feed-In-Tariff (FIT) supply contracts (e.g., wind, solar etc.), Bruce Power contract and IESO conservation expenditures;
 - Regulated payments for Ontario Power Generation nuclear and hydro; and
 - Other contractual costs such as: Payments to Non-Utility Generators (NUGs) under contract to the Ontario Electricity Financial Corporation (OEFC).

Historical Global Adjustment

Commodity Cost of Electricity (\$/MWh)



- Global adjustment experienced significant growth beginning in early 2009 as HOEP declined and IESO-contracted energy production increased.



Source: IESO

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Global Adjustment in any given month is equal to the sum of:

The difference between the market price and the regulated price OPG is entitled to receive for the output from its regulated facilities;

The difference between the market price and the contract price IESO-contracted generators are entitled to receive;

The difference between the market price and the payments to Non Utility Generators (NUGs) who have long standing contracts with the OEFC; and

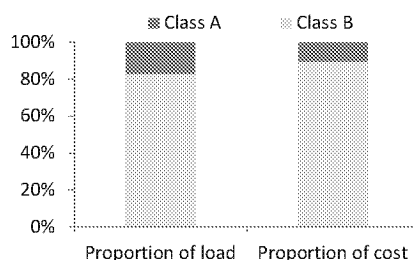
OPA conservation and demand management (CDM) spending.

Global Adjustment – Class A and Class B

- Global adjustment costs are charged differently depending on the size of the consumer.
- In January 2011, the province introduced the Industrial Conservation Initiative (ICI), establishing two classes of consumers: Class A and Class B.

Customer Type	Size	Current Consumers	GA Treatment
Class A	Monthly peak demand exceeding 1 MW	Nearly 300*	Charged GA on the basis of their contribution to system peak demand during the highest 5 system demand hours of the year.
Class B	All other consumers	About 5 million	Charged GA as a flat rate applied to their consumption.

*Following the September 15, 2016 announcement of the proposed ICI expansion, government forecasts over 1,000 additional businesses will be eligible to participate as Class A consumers.



- Class A is currently reserved for customers with monthly average peak demands greater than 3 MW.
- With the 2014 expansion of ICI, in July 2015, Class A includes consumers with monthly average peak demands greater than 3 MW in certain industries.**
- On September 15, 2016, the government proposed to reduce the Class A threshold to 1 MW. Sector restrictions would also be removed and smaller institutional and commercial businesses would be eligible to participate.



**3-5 MW consumers in the manufacturing, mining, refrigerated warehousing, data processing and greenhouse sectors

Delivery Charges

- The **delivery** charge portion of a consumers' electricity bill includes charges for **distribution** and **transmission**.
- Distribution and transmission rates must be approved by the Ontario Energy Board (OEB).
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- Distribution charges cover LDC costs of distributing electricity to consumers within a given LDC and rate class.
 - These charges include a fixed component that covers such things as meter reading, billing and general utility operations, as well as a variable component that is determined by the amount of electricity consumed.
 - The OEB recently approved a policy that will see all of the distribution charge move to a fixed monthly charge over the next few years.

Monthly Bill Statement

Account Number
000 000 000 000 000 0

Meter Number
00000000

Your Electricity Charges

Electricity	
488 kWh Off-peak (lowest price) @ 0.0 ¢/kWh	\$0.00
127 kWh Mid-peak (mid price) @ 0.0 ¢/kWh	\$0.00
135 kWh On-peak (highest price) @ 0.0 ¢/kWh	\$0.00
Delivery	\$0.00
Regulatory Charges	\$0.00
Debt Retirement Charge	\$0.00
Your Total Electricity Charges	\$0.00
HST	\$0.00

Total Amount **\$0.00**

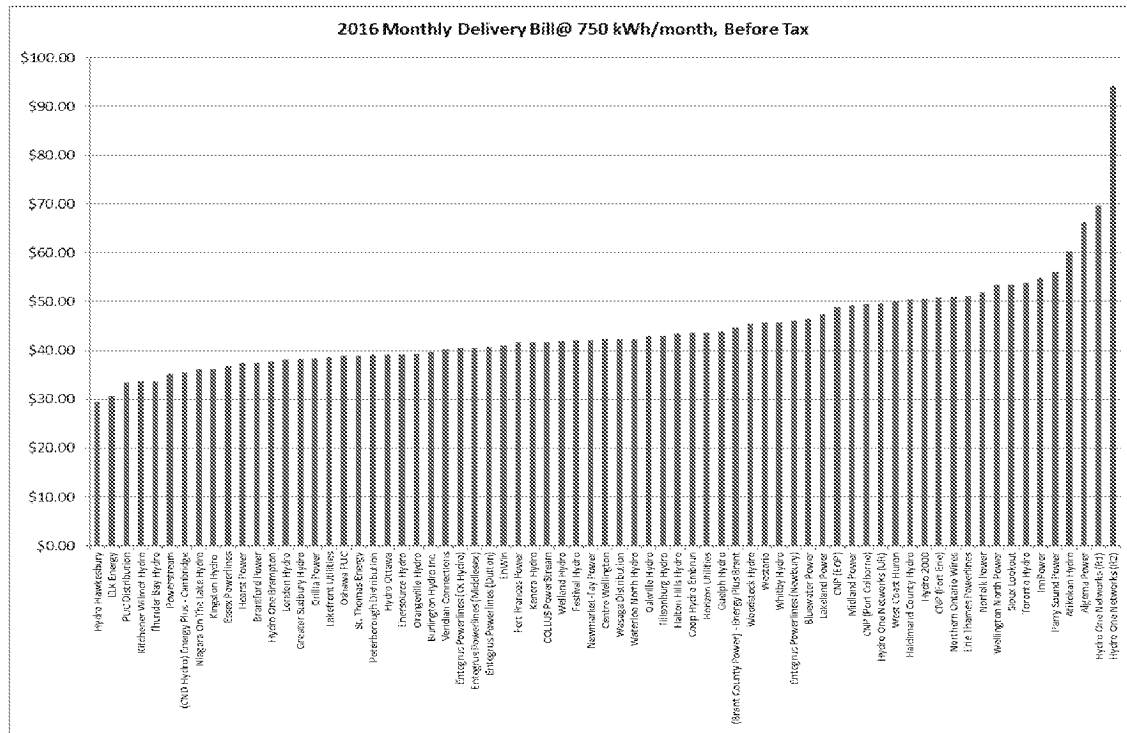
- Transmission charges cover the cost of transporting electricity over long distances at high voltage from generation sources to LDCs. These charges vary based on the consumption during a billing period
- The cost of serving customers who are in more rural or remote locations can be more expensive and may result in higher distribution rates for those customers.
- Also included within the Delivery line is a charge that reflects distribution system losses. This is a small amount of power that is consumed in the process of distributing electricity.



OEB Rate-setting Process

- The Ontario Energy Board (OEB) is the independent regulator of Ontario's electricity and natural gas distributors, which has a mandate to protect the interests of consumers, among other things.
 - Among its other legislative responsibilities, the OEB has the legislative responsibility to *"make orders approving or fixing just and reasonable rates for the transmitting or distributing of electricity"*
- No distributor can change its rates without the approval of the OEB. This means that when any distributor or transmitter wants to change its rates due to increased capital spending and/or increased OM&A costs, it must "apply" to the OEB.
 - The application is the company's evidence, which can be questioned by other parties that have an interest and can formally intervene in the process, including consumer and rate payer groups, industry groups, environmental groups, other utilities, other special interest groups, and the OEB's own staff.
 - When a company files an application that requires a hearing, the OEB requires the company to provide "notice" to all parties that could be materially affected, including its rate payers.
 - Typically, during a rate hearing, the OEB and intervenors will examine all the proposed capital expenditures and operations, maintenance and administration (OM&A) costs put forward for approval.
 - The OEB may not, and often does not, approve rate applications as filed, and may reduce the amounts requested.

2016 Monthly Delivery Bills



Regulatory Charges

- The regulatory charge includes charges related to the operation of the wholesale market, including charges such as:
 - **Physical Limitations and Losses:** When electricity is delivered over a transmission line, it is normal for a small amount of power to be consumed, or lost, as heat.
 - **Energy Reliability:** Sometimes the balance between generation and demand is affected by an unanticipated event, such as equipment failure or a surge in consumption. The IESO purchases reserve electricity that is available on short notice to restore the balance.
 - **IESO Administration Fee:** The IESO charges an administrative fee to manage the high voltage power system and operate the wholesale electricity market in Ontario.
- The regulatory charge also includes:
 - **Renewable Connections:** Some of the costs incurred by a utility to connect renewable generation facilities (e.g. solar, wind) can be recovered from consumers throughout the province.
 - **Rural and Remote Electricity Rate Protection:** This charge is collected by the IESO to pay certain electricity distributors who provide electricity service in rural and remote areas. It helps to offset the higher cost of providing service to consumers in those areas.
 - **Ontario Electricity Support Program (OESP) Charge:** This charge is collected to pay for the costs of the OESP. The program provides eligible low-income customers with a monthly credit on their electricity bills.
 - **Standard Supply Service Charge:** Customers who purchase electricity directly from their local utility, rather than a retailer, pay an administrative fee to their utility to cover these costs. This charge is the same for all utilities in the province and is set by the OEB.
- Other than the first two charges (which are market-based), the OEB sets these charges. A typical customer using 750 kWh/month pays a monthly regulatory charge of roughly \$5.00.

Debt Retirement Charge (DRC)

- The DRC is a consumption based charge of 0.7 cents/kWh, as set by the Ministry of Finance. All DRC revenue goes to the Ontario Electricity Financial Corporation (OEFC) to service and pay down the residual stranded debt and liabilities of the former Ontario Hydro.
- To help ease pressure on residential ratepayers, the government removed the cost of the DRC from residential electricity bills as of January 1, 2016. This will save a typical residential electricity ratepayer that uses 750 kWh per month about \$65 per year.
- Bill 144, the Budget Measures Act 2015, sets a fixed date for removing the DRC from commercial, industrial and other non-residential electricity users on April 1, 2018, nine months earlier than previously estimated.

Residential Bill Components

<i>Component</i>	<i>Sub-components</i>	<i>Notes</i>	<i>Monthly Cost for a Typical RPP TOU Consumer in Toronto (May 1, 2016)*</i>
Electricity	Hourly Ontario Energy Price (HOEP) + Global Adjustment (GA)	The Electricity line reflects the cost of generation and conservation initiatives in Ontario. HOEP is the hour-by hour market clearing price that reflects the short term cost of producing power. Global Adjustment ensures recovery of long-term generation, conservation and demand management costs.	\$84
Delivery	Transmission + Distribution	Costs to build and maintain the high-voltage transmission grid and distribution lines, towers and poles. A portion of these charges are fixed, while others are variable and increase with the amount of electricity usage.	\$54
Regulatory	IESO fees, rural/remote rate protection	The costs of administering the wholesale electricity system, maintaining the reliability of the provincial grid and providing financial assistance to consumers in rural and remote areas of the province, and low income assistance.	\$5
HST	n/a	Applied at a rate of 13%	\$19
Total:			\$161



*Source: Ontario Energy Report 2016 Q2

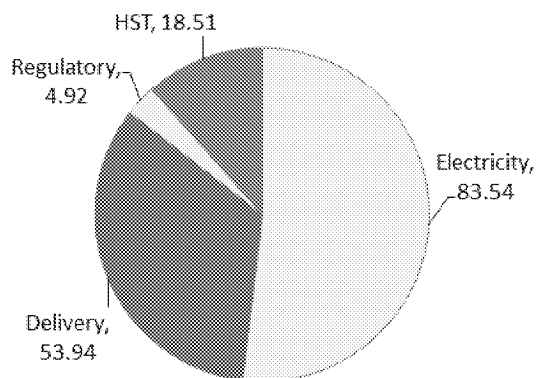
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Typical Residential Bill

Typical Residential Monthly Bill

As of May 1, 2016



Source: Ontario Energy Report 2016 Q2

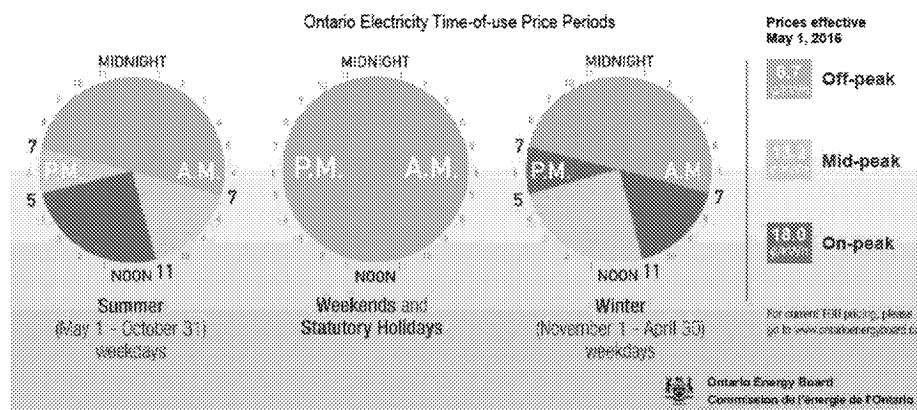
*Delivery charges vary across Ontario.

- For RPP consumers, the electricity charge accounts for about half of the bill.
- Delivery – transmission and distribution – are another 30%.*
- A typical residential consumer uses about 9,000 kWh per year, or 750 kWh per month.

Residential and Small Business Consumer Electricity Pricing

Regulated Price Plan (RPP):

- There are a total of about 4.8 million residential and small business consumers participating in the RPP. About 4.5 million residential and small business consumers pay Time-of-Use (TOU) prices under the RPP. RPP prices are adjusted every six months (in May and November) by the Ontario Energy Board based on projected supply cost over the next 12 months and true-up to actual costs incurred to date.
- 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.



Setting RPP Prices

- The Ontario Energy Board sets Regulated Price Plan (RPP) prices every six months.
- RPP prices are based on a projection of the cost to supply electricity and a forecast of electricity consumption over a 12 month period.
- Due to a number of factors, including a milder than forecast winter, there was a shortfall between the amount collected from consumers and the cost of electricity during the November 1, 2015 – April 30, 2016 RPP period.
- May 1, 2016 RPP prices increased to recover this shortfall from the previous period.
- Over the years, there have also been instances where the difference between forecast and actual costs has had the effect of decreasing RPP prices (e.g., November 2011).

Residential Rate Mitigation – Existing Programs

- The **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 \$1,008 in tax relief annually, and seniors can receive up to \$1,148 annually.
- The **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 \$146 annually and families (including single parents) can receive up to \$224 annually.
- The **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.
- The **saveONenergy Home Assistance Program** was developed to help income-eligible consumers manage their energy costs by providing home energy efficiency assessments and energy savings measures at no cost. Eligible participants can receive energy efficient appliances like refrigerators and window air-conditioners. Eligible participants in electricity heated homes can also receive a programmable thermostat, weather-stripping services and insulation services.
- The **Ontario Electricity Support Program (OESP)**, developed and implemented by the Ontario Energy Board (OEB) provides an ongoing rate reduction directly on the bills of low-income electricity consumers who have applied and meet the eligibility requirements. The OESP started January 1, 2016, when the OCEB ended. The OESP provides a fixed monthly credit directly on eligible customers' bills, the amount of which will be based on a consumer's household income and household size. This allows the program to provide the greatest benefit to low-income consumers in need of assistance.
- To help ease pressure on residential ratepayers, the government **removed the cost of the Debt Retirement Charge (DRC) from residential electricity bills** as of January 1, 2016.

Industrial Bill Components

Component	Notes	Year-To-Date May 2015
Electricity	Industrial users pay HOEP, this is the hour-by hour market clearing price that reflects the short term cost of producing power.	\$26/MWh
Global Adjustment	Large industrial users (over 3 MW** average monthly peak demand) pay GA based on their share of demand during the five highest demand hours of the year. All other industrials pay GA as a flat rate, based on their monthly consumption.	\$37/MWh*
Delivery	Includes transmission and distribution charges where applicable. Grid-connected industrial users pay only for the cost of transmission and avoid distribution costs.	\$10/MWh
Wholesale Market Service Charges	The costs of administering the wholesale electricity system and maintaining the reliability of the provincial grid.	\$4/MWh
Debt Retirement Charge	Electricity distributors collect this charge from consumers on behalf of the Ontario Electricity Financial Corporation. DRC services pays down the stranded debt and liabilities of the former Ontario Hydro.	\$7/MWh
Total:		\$84/MWh

*Includes Industrial Conservation Initiative benefit based on average for all eligible customers

**Eligibility expanded to 3 MW for certain industries, effective 2015. Government's proposed expansion of ICI, announced in September 2016, would extend eligibility to all consumers over 1 MW.



Industrial Rate Mitigation – Existing Programs

- The **Industrial Conservation Initiative** lowers costs for eligible large electricity consumers (i.e., those with monthly peak demand exceeding 3 MW) that reduce consumption during peak periods. ICI consumers reduce their electricity rates by 25 per cent on average. Effective July 2015, Class A includes energy-intensive consumers with an average monthly peak demand between 3 and 5 MW, whose primary business is manufacturing, mining, refrigerated warehousing, greenhouses and data processing. The expansion of the ICI allows consumers in specific electricity-intensive sectors to reduce their electricity costs by reducing their demand during peak hours. This initiative will also lower total system costs by deferring the need to build new peaking generation.
- The **Industrial Electricity Incentive** 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.
- Participants in the **Northern Industrial Electricity Rate Program** receive a rebate of two cents per kilowatt hour. On average, industrial electricity prices can be reduced by over 20% through the program. In 2015, the Ontario government announced the commitment to an ongoing NIERP beyond March 2016.
- The **Industrial Accelerator Program** 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 by positively impacting their bottom line.
- The **saveONenergy** for Business electricity conservation program offered by local distribution companies – offers distribution-connected customers financial incentives for audits, retrofits and process and systems improvements to help businesses better manage their electricity use.
- The IESO holds annual **demand response** auctions which provide availability and utilization payments to successful participants that commit to reducing their consumption when called upon to do so.

Rate Mitigation – New Initiatives

- The government is introducing legislation that, if passed, would provide an eight per cent rebate to five million electricity consumers, including:
 - Residential consumers;
 - Multi-unit residential buildings and other facilities used as residential rental units such as long-term care homes and school residences;
 - Small businesses; and
 - Farms.
- The eight per cent saving would go into effect as of January 1, 2017 and would result in savings of about \$130 per year or \$11 per month for a typical Ontario residential consumer.
- The Rural or Remote Rate Protection (RRRP) program reduces electricity delivery costs for approximately 330,000 customers located in rural areas. Ontario intends to increase funding to the RRRP, which, combined with the eight per cent rebate, would result in electricity relief for eligible consumers of approximately \$45 per month or \$540 per year.

2017 Long Term Energy Plan

- This year, the Ministry of Energy is beginning to develop its next Long-Term Energy Plan (LTEP).
- Developing the LTEP is a highly collaborative process. The Ministry works closely with its agencies and stakeholders during LTEP consultations and development.
- LTEP consultations are expected to take place in fall 2016. The consultations will be supported by an electricity technical report prepared by the IESO and a fuels sector technical report prepared by an independent third party.
- The electricity technical report – called the Ontario Planning Outlook – and the Fuels Technical report are available on the IESO and Ministry websites respectively.
- Building off of the 2013 LTEP process, Indigenous engagement will be an important part of the 2016 LTEP. The Ministry of Energy will hold Indigenous engagement sessions as well as offer a formal process to submit feedback through the Environmental Registry.