

# Your guide to electricity pricing in Ontario

*A guide designed to help you understand and decipher the components of your electricity bill for your Ontario-based commercial or manufacturing business.*

- Samira Viswanathan, Market Regulatory Affairs Advisor, Bruce Power Direct

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# Part 1: The Electricity Basics

## **ELECTRICITY BILLS ARE COMPLEX**

It can be frustrating to consistently pay for something you don't understand or don't have the transparency to verify. It's even more painful when your electricity bills continue to go up without a clear explanation of the cause. What is driving the electricity cost increase? How can you reduce costs in this situation?

The first step to solving a problem is understanding it. This guide will help you understand the main parts of your bill, how the electricity price is derived, and what parts of the bill you can realistically influence and control.

Eventually, you will be able to use this knowledge to help with things like reducing your demand charges, conserving electricity, making more informed investment decisions and ultimately, helping you define key performance indicators (KPIs) for your business.

## **THE DIFFERENCE BETWEEN ENERGY (kWh) AND DEMAND (kW)**

### **1 kilowatt (kW) – this is a measurement of energy**

1 kW is like saying your car can go 1 km/hr – think of it like speed. In the electricity world this is known as power, capacity or demand.

5 kWh is like saying your car went 5 km over a period of time – think of it like distance. In the electricity world this is called energy or consumption.

So, if you are a business with a 1,000 kW demand, you may consume, over the course of a month  $1,000 \text{ kW} \times 30 \text{ days per month} \times 24 \text{ hours per day} = 730,000 \text{ kWh}$  in a month.

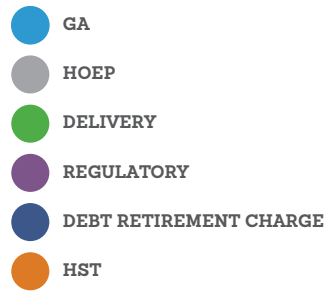
However, you may not always be going at a speed of 1,000 kW so to accurately measure how far you have gone, your local distribution company (LDC), also called a utility, will come and read your meter. Your electricity meter is like the odometer of your car.

**Your electricity price is made up of both demand (speed) and consumption (distance) charges.**



## COMPONENTS OF YOUR ELECTRICITY BILL

Utilities vary how they display your information but generally, your bill is grouped into the categories outlined in the charts below.



BILL COMPONENT	TYPE OF CHARGE
Electricity (includes the global adjustment)	Consumption
Delivery	Demand
Regulatory Charges	Consumption
Debt Retirement Charge	Consumption
HST	Consumption and Demand (based on entire bill)

## MAJOR ENERGY PLAYERS IN ONTARIO

Prior to deregulation, the electricity sector was essentially Ontario Hydro. However, since deregulation in May 2002, the sector is now composed of:

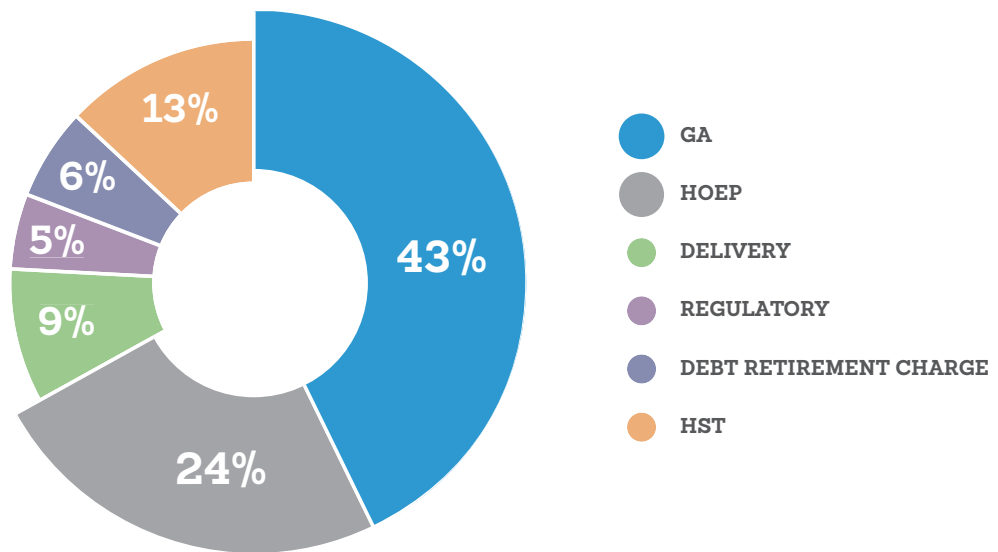
- 1. Government of Ontario:** controls overall direction and policy.
- 2. Ontario Energy Board:** regulatory body.
- 3. Ontario Power Authority:** electricity planner.
- 4. Independent Electricity System Operator (IESO):** grid operator.
- 5. Hydro One:** Transmitter and distributor. It is the only one of the 77 utilities that is entirely owned by the province.
- 6. Ontario Power Generation (OPG):** electricity generator. It is one of many generators in Ontario, but is the only one to be entirely owned by the province.
- 7. Bruce Power:** electricity generator. It is the largest nuclear plant in the world responsible for 30% of the Province's energy supply.

## Part 2: Factors that affect electricity price in Ontario

### WHAT MAKES UP THE ELECTRICITY PRICE?

This is the consumption portion of your bill where you are billed by a rate at c/kWh based on your meter reading, usually monthly.

#### ELECTRICITY PRICE BROKEN DOWN



The electricity price portion of your bill is further broken down into two price components:

1. Electricity Price: Also known as the spot price, the market clearing price (MCP), or the Hourly Ontario Energy Price (HOEP)
2. Global Adjustment: This used to be the called the Provincial Benefit

Both of these prices are constantly changing but you are charged the weighted-average price over the course of the month.

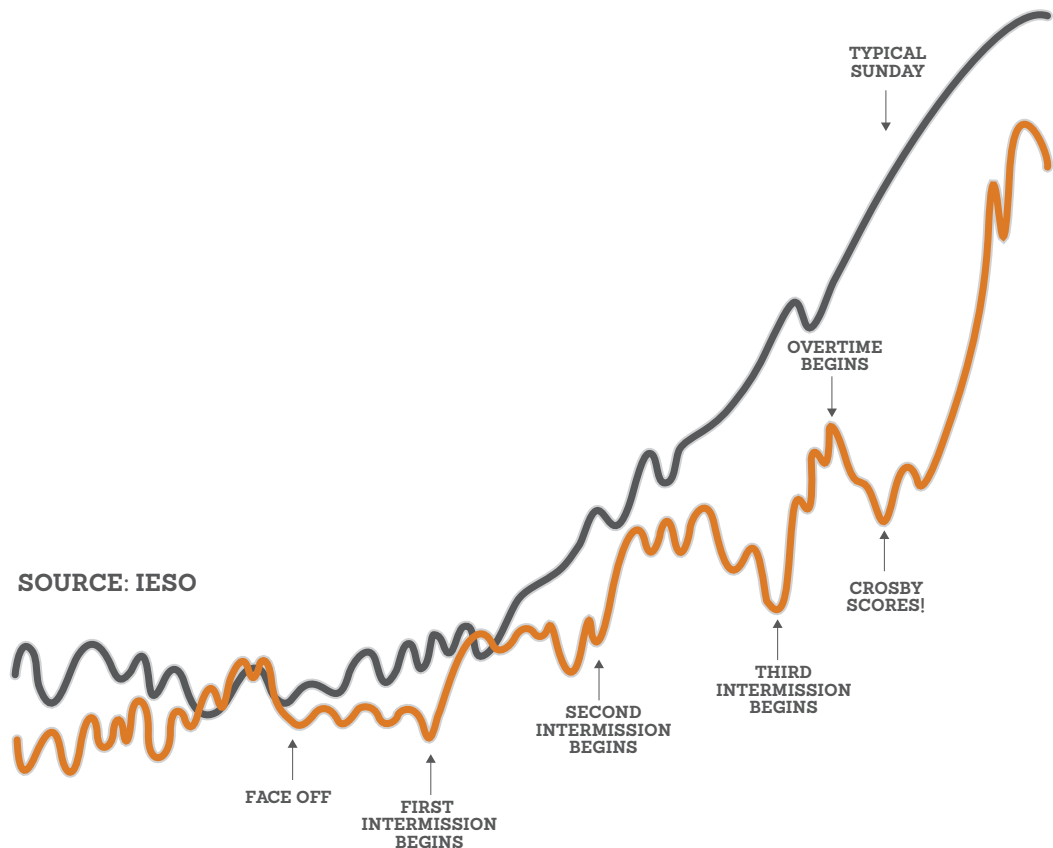
The electricity price is determined by the intersection of electricity demand and electricity supply. Both demand and supply are constantly and simultaneously varying.

## ELECTRICITY DEMAND

Demand varies based on things like weather and economic activity. Things like air conditioning and heating increase electricity demand. In exceptional circumstances even a hockey game can influence demand.

The graph below shows electricity demand on a typical Sunday (shown in grey) and compares it to the Sunday when Canada beat the U.S. in the ice hockey 2010 Olympic finals (shown in orange). Demand during the game was overall lower than a typical Sunday, as many people were gathered together in one room to watch the game. Spikes are noted during intermissions where people left where they were gathered to cook food, turn on lights, or use the bathroom – all things which increase demand.

### ONTARIO ELECTRICITY DEMAND FEBRUARY 28, 2010



## ELECTRICITY SUPPLY































Electricity supply comes from different fuel types, like wind, solar, hydro (waterpower), natural gas, and nuclear. These fuel types have different supply characteristics, all of which are needed to meet Ontario demand:

- Base-load supply includes sources like nuclear and hydro. They are low-cost, reliable and supply electricity 24-7.
- Intermittent supply includes sources like wind and solar. They provide electricity when the wind is blowing and the sun is shining.
- Peaking supply sources like gas and peaking hydro are used when demand is at its highest – they are flexible but costly.

Different fuel types also have different trade-offs when looking at costs, environmental aspects and reliability. There is a need for different types of supply but it is important to recognize that among these sources, there are drawbacks and benefits.

The Ontario government looks at these trade-offs (shown below) to help them develop energy policy in the province.

## ONTARIO ELECTRICITY SUPPLY

ENERGY TYPE*	ELECTRICITY COSTS	CAPITAL COSTS	FLEXIBILITY	CARBON EMISSIONS	AVAILABILITY
Gas 					
Solar 					
Wind 					
Water 					
Nuclear 					

\*Denotes new generation plants

Source: Electric Power Research Institute and Ontario Ministry of Energy



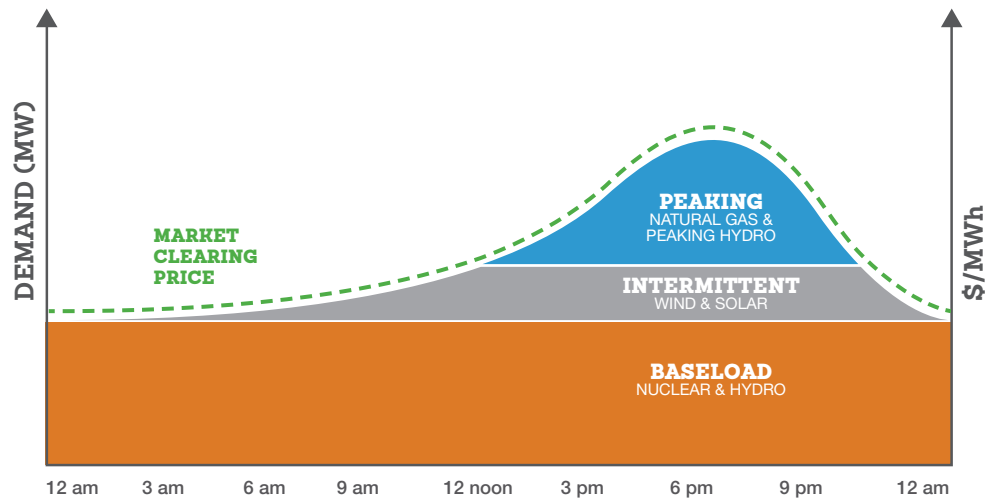
## ELECTRICITY PRICE

The price for electricity in Ontario is set every 5 minutes based on the intersection of supply and demand and fluctuates like stock prices. This is called the market clearing price (MCP). It is set in the following way:

- Electricity supply is offered into the market at its operating cost. Offers of supply are stacked up from least costly to most expensive to meet demand. Where they intersect is the market clearing price (MCP).
- In each hour there are 12 MCP's, and the hourly average of the MCP is called the Hourly Ontario Energy Price (HOEP). This is what you get charged by your local utility.

On your electricity bill you see a volume-weighted average\* HOEP, when in reality the price fluctuates on a 5 minute basis. Many large industrial users attempt to estimate upcoming hourly prices and adjust their consumption in light of changing hourly prices, to avoid the highest priced hours and reduce their costs. Is there anything you can adjust in your facility to avoid the highest priced hours of the day?

### HOURLY ONTARIO ENERGY PRICE



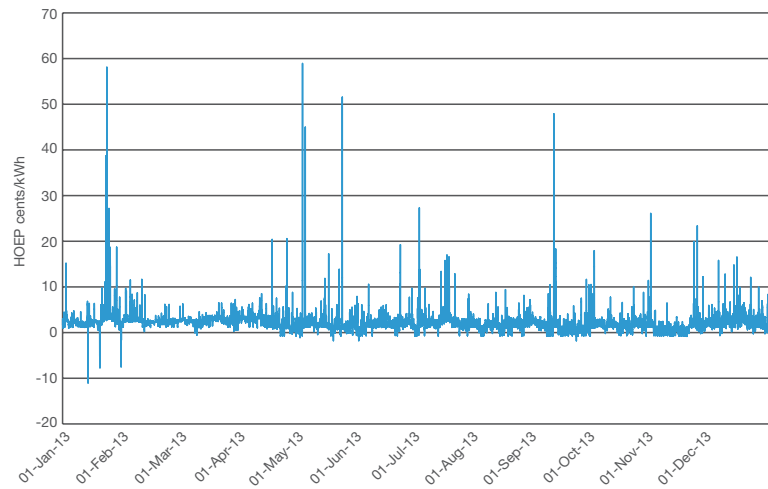
### \* WEIGHTED AVERAGE EXAMPLE

TIME	ENERGY (kWh)	HOEP (¢/kWh)	COST (\$)
9:00 AM	1400	1.43	19.95
10:00 AM	1500	1.81	27.20
11:00 AM	1600	2.38	38.05
12:00 PM	1600	3.24	51.90
1:00 PM	1500	3.35	50.27
<b>TOTAL</b>	<b>7600</b>	<b>N/A</b>	<b>187.36</b>
Weighted Average HOEP (\$187.36/7600 kWh) =		<b>2.47 ¢/kWh</b>	



**MONTHLY  
CHARGE IN  
GLOBAL  
ADJUSTMENT  
(¢/kWh)**

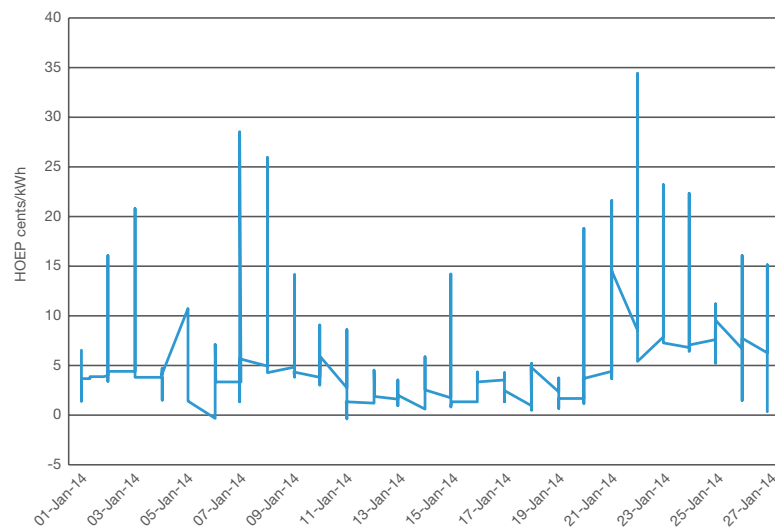
The average HOEP for 2013 was 2.5 cents/kWh, and although you don't see it reflected in your bill, this 2.5 cents average is based on a lot of volatility over the year:



If you avoided the top 100 most expensive hours in 2013 you could lower your average price by 6%.

Price volatility was recently evident in the January 2014 polar vortex which caused major price spikes.

**MONTHLY  
CHARGE IN  
GLOBAL  
ADJUSTMENT  
(¢/kWh)**



As previously mentioned, the electricity price is derived from the intersection of supply and demand. Supply of electricity comes from different sources which have their own characteristics and trade-offs between costs, environmental friendliness, and reliability. Demand changes based on weather and economic activity. As both supply and demand are highly volatile the price fluctuates wildly on a 5 minute basis; however, the electricity price you see on your bill is the hourly weighted average over the month.

## Part 3: The Impact of the Global Adjustment on Electricity Price

Since suppliers offer their supply at their operating cost, the market clearing price can often not be high enough for them to cover all of their costs. For example, the average HOEP in 2013 was 2.5 cents/kWh, which was not enough for suppliers to cover the costs of operating their plants.

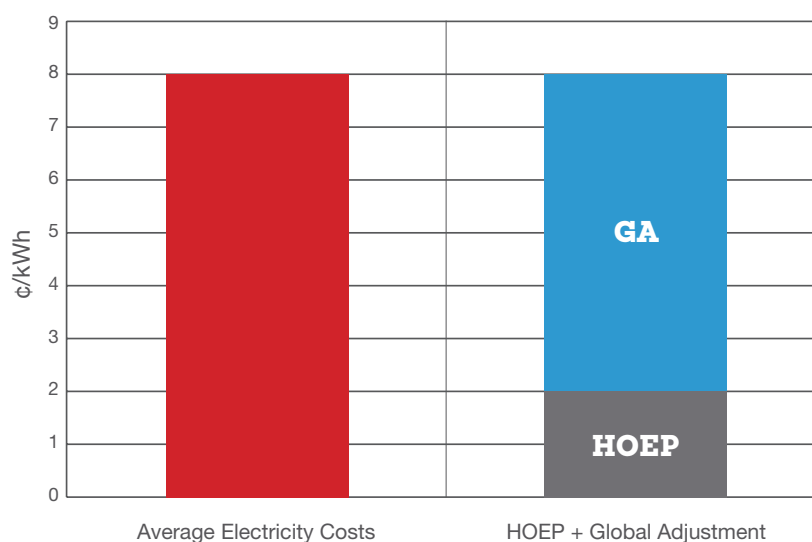
To ensure Ontario has enough electricity supply, the government has signed long-term contracts with most suppliers to make sure they will invest in Ontario, build power plants, and be paid enough to cover their costs (plus a reasonable rate of return). These costs are recovered through the global adjustment.

### WHAT IS THE GLOBAL ADJUSTMENT AND HOW DOES IT IMPACT ELECTRICITY PRICE?

The global adjustment is the difference between the market price and electricity price contracted by the government. It is the “top-up” that most suppliers are paid when they generate electricity.

This means that as the market price goes up, the global adjustment goes down as suppliers are recovering more of their costs from the market and less from the global adjustment. As a consumer, you pay both.

For example, if the Hourly Energy Ontario Price is 2 cents/kWh, and an electricity generator has a contract with the government for 8 cents/kWh, the global adjustment is 6 cents/kWh. You, as a consumer of this electricity are charged a total of 8 cents/kWh.



**GLOBAL  
ADJUSTMENT**

Suppliers have individual contracts, so the amount of the global adjustment will change depending on which suppliers are meeting demand. One contract may be for 13 cents/kWh while another is for 5 cents/kWh. The actual payment to a supplier will be the amount of their contract multiplied by how much they generated:

**13 cents/kWh \* 300,000,000 kWh/month = \$M 39/month**

**5 cents/kWh \* 1,000,000,000 kWh/month = \$M 50/month**

Typically, the more expensive resources produce less kWh as they are used at “peak” times, when Ontario consumption is at its highest.

### **THE ROLE OF THE INDEPENDENT ELECTRICITY SYSTEM OPERATOR (IESO)**

Ontario’s grid operator, the Independent Electricity System Operator (the IESO) calculates the monthly global adjustment which is then used to determine electricity price and billing.

#### **They make two estimates and then provide a final actual amount:**

- The 1st estimate is provided on the last business day of the month for the next month (e.g., 1st estimate for October is published on Sept 30)
- The 2nd estimate is provided on the last business day of the month for the current month (e.g. 2nd estimate for October is published on Oct 31)
- The final rate is published at the middle of the following month (e.g., the final October rate is posted around November 15).

These preliminary estimates need to be made in advance of the final so that the LDCs can bill their customers on time by using the 1st or 2nd estimate and then truing up their customer in the following bill cycle. The majority of customers in Ontario are billed using the first estimate of the global adjustment.

#### **If we look at the September 2013 1st estimate, the IESO had to:**

- Estimate the amount of supply and the “top-up” money that will be paid to suppliers (millions of dollars each month) = \$M 666.7, and divide it by;
- Estimate of monthly of all Ontario consumption = 7,647,396 MWh, to arrive at \$63.08/MWh (or 6.308 cents/kWh)

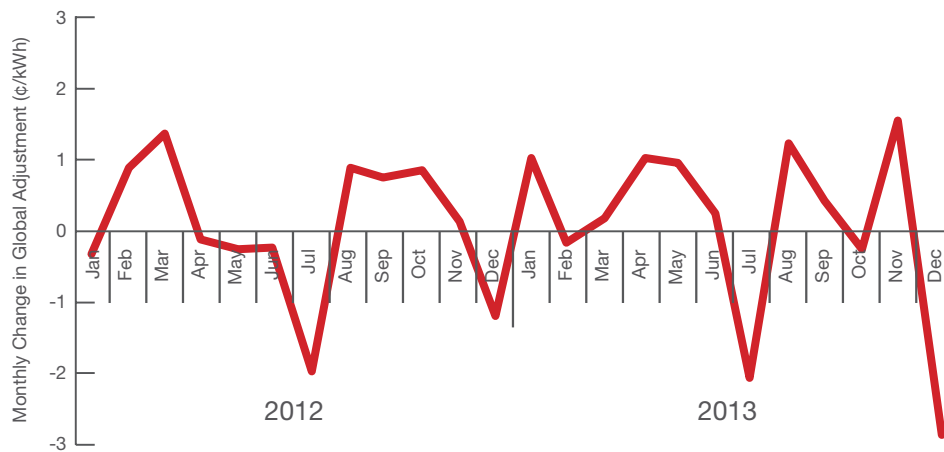
**\*Note: 1 MWh = 1000 kWh.**

This is no simple task and is why there is often a deviation between both estimates and the actual rate. You can find the IESO’s global adjustment information here.

<http://www.ieso.ca>

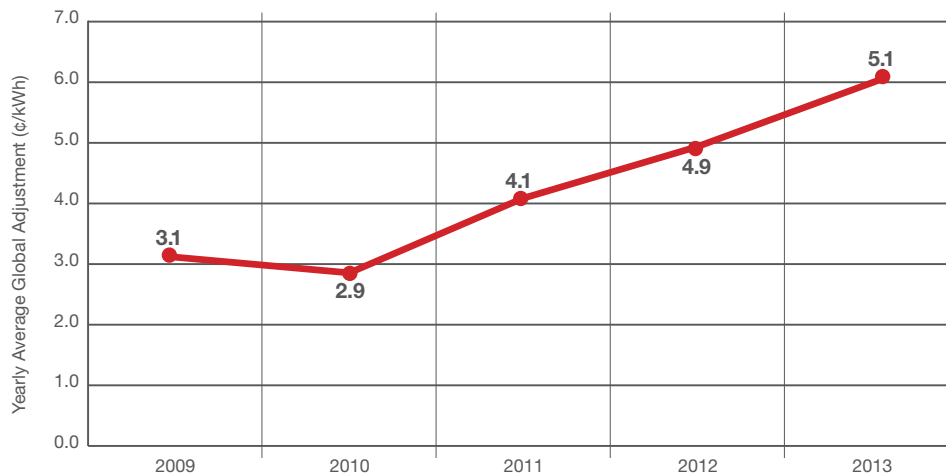
**MONTHLY  
CHANGE IN  
GLOBAL  
ADJUSTMENT  
(¢/kWh)**

There is also variation in the global adjustment month over month, as illustrated in the graph below.



It is difficult to predict the variation in global adjustment but it is clear that the global adjustment is on the rise. It will continue to rise as suppliers with government contracts build projects that require this “top-up” to the market price. The graph below shows the increase in yearly global adjustment since 2009:

**YEARLY  
AVERAGE  
GLOBAL  
ADJUSTMENT  
(¢/kWh)**



You pay the global adjustment based on how much you consume. This amount varies all the time as it is based on the “top-up” paid to suppliers of electricity and total amount of consumption in the province for a given month.

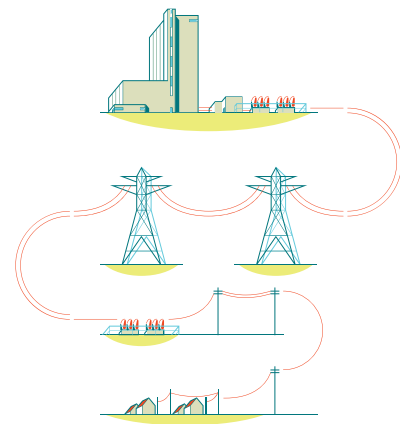
**Both the global adjustment and HOEP are energy consumption based charges. If you had a monthly January 2014 meter reading of 730,000 kWh you would get billed:**

1. Electricity Price = 730,000 kWh \* 5.7 cents/kWh (weighted average HOEP) = \$41,61
2. Global Adjustment = 1,000,000 \* 3.626 cents/kWh (GA 1st estimate) = \$26,280
3. Total Electricity Charge = \$67,890/month

## Part 4: Types of Electricity Charges on Your Bill

### 1. DELIVERY CHARGES

This is the portion of your bill that utilities charge to deliver electricity from a generator (e.g., Bruce Power’s nuclear power plant) to the transmitter’s system (e.g., Hydro One), to the distributor’s system (e.g., Toronto Hydro), then to your business, as depicted in the illustration.



There are 77 utilities that deliver electricity directly to homes and businesses in Ontario. [http://www.ieso.ca/imoweb/siteShared/local\\_dist.asp](http://www.ieso.ca/imoweb/siteShared/local_dist.asp)

The delivery charges on your bill cover the costs for a utility to build, operate and maintain infrastructure, such as transmission lines, distribution lines, towers, poles and transformers. It also includes costs that the utility needs to recover for billing, administration, day-to-day and emergency services, or any other service it provides.

The delivery charge is comprised of a fixed monthly charge and a variable charge. For business and industry, both charges are based on your demand (kW).

The rate charged by utility companies is regulated by the Ontario Energy Board (OEB), an independent government agency that serves the public interest. These rates are determined on a five-year cycle. The OEB reviews each rate application through a public process, and then sets the rates for the distributor to charge. The rate application is based on a distributor’s costs

## 2. REGULATORY CHARGES

Regulatory charges are the costs of administering the electricity system and market, maintaining the reliability of the provincial grid, and covers administration fees of the IESO and the OPA. Utilities collect this charge and pass it through to the IESO who operates the Ontario grid and the OPA who manages long term planning.

## 3. DEBT RETIREMENT CHARGE

The Debt Retirement Charge of 0.68¢ /kWh pays down the residual stranded debt of the former Ontario Hydro. Utilities collect this money and pass it through to the Ontario government. Although the debt was acquired in the past, it is paid by today's electricity customers since the electricity generation and transmission infrastructure financed by the debt continue to be used by all Ontario's electricity consumers.

By law, the Debt Retirement Charge will end when the government's assets and the estimated value of its other dedicated revenues from the electricity sector are sufficient to service and retire the remaining amount of debt and other liabilities. The government estimates that the Debt Retirement Charge will likely end between 2015 and 2018.

Click here for more information.

<http://www.fin.gov.on.ca/en/tax/drc/index.html>

## 4. ONTARIO CLEAN ENERGY BENEFIT (OCEB)

The Ontario Clean Energy Benefit takes 10% off the cost of up to 3,000 kWh/month of electricity use. A medical exemption from the 3,000 kWh/month cap is available.

Medical Exemption.

<http://www.energy.gov.on.ca/en/clean-energy-benefit/#qme#qme>

Click here for more information.

<http://www.energy.gov.on.ca/en/clean-energy-benefit>

The OCEB expires on December 31, 2015.

## Part 5: Quick tips to reduce consumption and costs

Based on the information in this guide, there are 6 things you can do to start reducing consumption and saving money for your Ontario-based business today.

- 1.** The electricity component of your bill is charged on a weighted consumption (kWh) basis, so the less you consume the lower the portion of your bill will be. However we now know that it also matters when you consume, so the best thing to do is avoid consuming in times when the price of electricity is high. This typically happens in the “peak” hours of the day from 7am to 7pm. You can also sign contracts with an electricity retailer like Bruce Power Direct for a set price of electricity over a longer period of time (e.g., 1 year).
- 2.** Similarly, consume less during peak hours of the day. The global adjustment is charged on a weighted consumption (kWh) basis, so the less you consume during peak hours of the day, the lower this portion of your bill will be.
- 3.** The delivery component of your bill is charged on a demand basis. Some utilities like Toronto Hydro charge you based on your maximum demand and your demand during peak hours (7am – 7pm on weekdays). Other utilities use your average demand. Depending on your utility, lowering your maximum, peak, or average demand will lower your delivery costs.
- 4.** The regulatory component makes up about 5% of your bill. The majority of this charge is billed on a consumption basis; therefore, the less you consume, the less you pay.
- 5.** The Debt Retirement Charge is also a consumption based charge – the less you consume, the less you pay.

## For More Information

For more information on anything included in this guide, or advice on how to reduce costs and consumption even further, please contact Bruce Power Direct:

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### **BECOME AN EMPOWERED ELECTRICITY CONSUMER.**

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