

# THE RISING COST OF POWER IN ONTARIO: A RATEPAYERS' PERSPECTIVE

February, 2010

Electricity consumption represents only ½ the charges on the consumers' monthly bill

The other ½ is for charges consumers have little control over – these other charges are rising significantly

A 1st wave of change (2002-2005 – Deregulation) brought electricity price hikes of 33%- 52%

A second wave of change, resulting from electricity restructuring since 2005 brought price increases which are just now being felt

A 3rd wave of changes – of greatest impact – will hit over the next few years  
Costs to all consumers will rise as a result of the Green Energy Act, Smart Meters and Private Power Generation Contracts

## **EXECUTIVE SUMMARY**

***“I had hoped to live to forge a band of iron around the Hydro to prevent its destruction by the politicians.”***

(Sir Adam Beck prior to his death, 1925)

If Ontario's electricity system was in dire straits at the turn of this, the 21<sup>st</sup> century, we are in a worse position today and we face a bleak future. Energy rates are set to escalate, impacting our economy and quality of life. Affordability and reliability of electricity are threatened.

BILLIONS upon BILLIONS of dollars is being spent on electricity restructuring and we will have little to show for it.

\$45 billion for new/refurbished resources

\$10.2 billion for conservation/demand management programs – with unclear and uncertain results

\$9+ billion for transmission infrastructure

\$20 billion stranded debt (although we have been paying \$1.085 Billion/year since 2001)

\$2.3 billion for smart meters (plus monthly fees)

\$18 - \$46 billion cost to consumers as a result of the Green Energy Act - Plus resulting job losses

The percentage increases on power rates to consumers is distressing:

30%-150% higher electricity costs from new power generation – 80% of resources are to be new or refurbished

30% increase in administration costs for the electricity system in 1 year (\$2.5 Billion 2007 - \$3.5 Billion 2008)

20% increase in delivery costs of electricity to large consumers

10.6% increase in delivery costs to residential consumers over the next 2 years alone -20%-25% in some areas

13.3% increase in delivery costs in 2011 **in addition** to the above rate increases

12.5% increase in delivery costs to the farming community 2009-2010

8% increase on bills when the HST is introduced next year

33%-60% increase on electricity costs for small business/commercial users during business hours

33%-60% increase on residential costs during normal waking hours through the week

5+% increase for natural gas support payments

5% increase to fund conservation programs

These costs are indicative, not exhaustive. Ontario's ratepayers will be reeling with the costs of an electricity system that is neither reliable, nor affordable. Industry and manufacturing will continue to move out or simply close shop.

With the Darlington nuclear rebuild on hold; a decision to refurbish Bruce nuclear units, but potentially not Pickering B units; coal closure; and significant new private generators in the mix, Ontario Power Generation will have little market share. We are tossing out our public utility that, with oversight and accountability, could be revived to provide power at cost to the people of this province.

A decade of power restructuring has weakened our vital energy system. The attempt at creating an open electricity market has failed – miserably! An open market promised competition to drive down prices and a moving of the risks away from the consumer on to the developer. Four years ago the federal parliamentary research service noted the fundamental flaws associated with the provincial government’s intervention in the electricity system – the potential impacts on cost and risk to Ontario consumers. These flaws have found fruition in the ensuing years, as highlighted in the following quotes, from the C.D. Howe Institute, “Power Failure: Addressing the Causes of Underinvestment, Inefficiency and Governance Problems in Ontario’s Electricity Sector”.

*“A market structure based on long-term contracts allocates credit risk to the buyer and ultimately to ratepayers or taxpayers. ... long-term contracts through a single purchaser (i.e. the OPA) provide generators with shelter from significant risks, such as market prices dropping due to decreases in demand, or their product becoming uncompetitive because of technological improvements in alternative generation. ...*

*The current Liberal government has used its legislative powers to mandate that OPA planners include and ignore certain technology choices. These measures may arguably be promoting inefficient decisions regarding generation technology. ...*

*Central procurement results in questionable cost-effectiveness and allocates risk in ways unfavourable to ratepayers. These problems are compounded by the opportunities for political intervention in investment decisions and the high administrative costs. ...*

*While central procurement will help Ontario meet the needs for more generation investment in the short run, it is questionable that it is the best mechanism of achieving a well-functioning electricity sector in the long run. Meanwhile, central procurement in other jurisdictions has resulted in buyers paying prices significantly exceeding spot market prices, in spite of the fact that buyers bear technology, market and credit risks.”*

Ontario consumers are paying close to \$4 Billion each year for energy experts in this province yet we have unprecedented political intervention. Policy directives are the basis for **all** decisions made in the electricity sector. Political will - not sound scientific and economic principles - is driving energy policy. Ideology, influenced by lobbyists is clouding the judgment of current decision makers. The public is largely misinformed but people are now beginning to see the changes taking place – on their electricity bills, in their inability to oppose current changes, and in the continuing loss of manufacturing jobs in this province.

Carol Chudy  
Co-Chair, CAE Alliance

## **THE PRICE OF POWER**

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## WHERE WE WERE

### 1.1 A Century of Ontario Hydro's Dominance of the Provincial Electricity Industry 1906-1999

- 1906 - Ontario Hydro Commission – 1st publicly owned electric utility in the world  
Power at cost to the people – tax exempt; not intended to operate for profit
- 1925 - World's largest hydroelectric plant - Niagara Falls
- 1952 - 1978 – Economic growth/Insufficient hydraulic (water) power leads to diversification with coal-fired generating stations
- 1967 to 1993 - Development of nuclear power – 20 units - Higher costs, overruns and technical difficulties
- Darlington build – 1973 to 1993 - Two recessions, high interest rates, tighter safety regulations after Three Mile Island accident (1979) and Chernobyl (1986) - Many engineering problems – Political “ping-pong” (stop/start)  
Price tag: \$2.5 Billion (1983 dollars) mushroomed to \$14.3 Billion
- 1973 Ontario Energy Board (OEB) becomes responsible for electricity rate reviews
- 1974 – Ontario Hydro becomes a Crown Corporation - open to scrutiny, but not regulation – Government appointed Board of Directors  
Responsible for generation, transmission and distribution of electricity – costs were “bundled” together  
Rates set by Ontario Hydro to recoup costs for generation/delivery of electricity + future capital costs
- By 1995 unable to sustain system on incoming revenues – mounting debt – went from 2nd lowest to 2nd highest rates in Canada in 15 years (1980-1995)
- 1997 7 nuclear units out of commission
- 1998 – MacDonald Committee - Ontario government commits to deregulated/competitive market with assurances to ratepayers that it would lead to lower prices and more options for consumers  
Energy Competition Act is passed  
Generation to be open to market participants – transmission/distribution remains non-competitive  
Winter 1998 ice storm damages 40% of Ontario Hydro's distribution system - costly
- April, 1999 restructuring of Ontario Hydro - broken into 5 companies – Hydro One (transmission); Ontario Power Generation or OPG (generation); Independent Electricity System Operator or IESO (system dispatch); Ontario Electrical Safety Authority; Ontario Electricity Financial Corporation (debt reduction)
- 1999 – Net “stranded” debt \$20.9 Billion debt (liabilities in excess of assets) –actual debt approx. \$32 Billion
- 2001 charge of 0.7 cents/kwh to ratepayers to reduce debt
- OPG given business operation mandate – allowed to make marginal profit – subject to corporate taxation
- 2001 - Bruce Power leases/operates OPG nuclear facilities near Kincardine – 16% of provincial power production
- 2002 - Ontario Energy Board becomes financial regulator for transmission, distribution and all market participants for electricity and natural gas – enhanced mandate to protect consumer rights re: affordable, reliable power
- May 2002 – Market Opens – consumers have option to purchase power on market, or by contract

## 1.2 MARKET DAYS

**DEREGULATION** – With the breakup of Ontario Hydro (1999), it was determined that OPG would be only 1 of many generating companies supplying power to Ontario consumers. OPG would produce and sell power to provincial and neighbouring consumers in competition with other private generators allowed access to the Ontario market.

**PROMISE:** Create a competitive wholesale market; Procure new generation from the private sector; Move to full retail competition - A competitive marketplace would lower prices, provide options for consumers and move risks from ratepayers to private power generators.

### **REALITY:**

- May, 2002 – Market opens 2 years behind schedule - Average price for power 3.1 ¢/kWh
- Summer, 2002-Dramatic increase in pricing due to hot summer, lower generating capacity, reliance on imports – large distribution rate increases - politically charged situation – prices double to 6.2 ¢/kWh
- Enron scandal in U.S. coupled with overbuild of power plants in U.S. (primarily natural gas) = collapse of merchant power industry
- December 2002 – Rates for residential, farming, “MUSH” sector (Municipalities, Universities, Schools, Hospitals) were capped at **4.3 ¢/kWh** (premarket rate)
- OPG to rebate consumers for all charges above capped rate retro from market opening until May, 2006 (but we have been paying for this through the debt reduction charge portion of our bills)
- Transmission & Distribution rates frozen
- “Hybrid” system evolves:
  - market participants + provincial utility (OPG)
  - contracts with power producers + capped/regulated rates on OPG assets
- Nuclear concerns led to increasing reliance on coal-fired power generation (1997-2001)
- Environmental initiatives plus increasing concern for future power resource availability leads to tri-party task force on electricity
- 2003 – Change of Government
  - Political Promise to close all coal-fired power plants by 2007 – 25% of provincial power resources
- 2003 - Electricity Conservation & Supply Task Force (tri-party task force) recommends creating an agency for long term planning and conservation initiatives – advises that:
  - “Ontario faces a looming electricity shortfall as coal-fired generation is taken out of service and existing nuclear plants approach the end of their planned operating lives ... By 2014, the province would have only half the generation capacity it needs to ensure adequate and reliable electricity service.”*
- 2004 Electricity Restructuring Act enacted – significant changes – greater political intervention
- 2005 - Ontario Power Authority (OPA) formed – tasked with preparation of 20 year power plan
- Government directives become the driving force behind all power resource acquisition and development

## 1.3 RISING COST OF POWER

### Regulated Price Plan Prices: Historical Snapshot

The following chart provides a brief description of electricity commodity prices since 2002. The chart also shows the changes to the residential threshold between summer and winter seasons.

Set By	Effective Date	Lower Tier Price (per kWh)	Residential Threshold for Lower Tier Price (per month)	Higher Tier Price (per kWh)
Ontario Energy Board	Nov 1, 2008	5.6¢	1,000 kWh	6.5¢
	May 1, 2008	5.0¢	600 kWh	5.9¢
	Nov 1, 2007	5.0¢	1,000 kWh	5.9¢
	May 1, 2007	5.3¢	600 kWh	6.2¢
	Nov 1, 2006	5.5¢	1,000 kWh	6.4¢
	May 1, 2006	5.8¢	600 kWh	6.7¢
	Nov 1, 2005	5.0¢	1,000 kWh	5.8¢
Government Regulation	Apr 1, 2005	5.0¢	750 kWh	5.8¢
	Apr 1, 2004	4.7¢	750 kWh	5.5¢
	Dec 9, 2002		4.3 ¢ per kWh/mo.	

→ See page 17 for an explanation of this price spike

[www.oeb.gov.on.ca](http://www.oeb.gov.on.ca)

■ As of November 2009, the price increased to **5.8 ¢/kWh** (lower tier) and **6.7 ¢/kWh** (higher tier).

\*Notice that the price threshold (summer) has changed from 750 kWh to 600 kWh. This means that the higher price kicks in sooner.

■ This represents a price increase of **35%** for lower threshold use, **55%** increase for higher use, since rates were capped Dec. 2002. This is for the commodity cost of power alone. (Average home use is approximately 1,000 kWh/month – Hydro One.) “Commodity cost” is the price for actual electricity used expressed in cents per kWh.

■ This Regulated Price Plan (RPP) covers residential, small businesses and other low volume consumers.

■ On November 1, 2009, Ontario’s public sector including municipalities, universities, schools, hospitals and other designated customers – farms and specified charities - moved from paying the Regulated Price Plan (RPP), as shown above, to a market-based, or hourly, price for electricity. These consumers will also pay the “provincial benefit” costs. See pages 15-17.

## 1.4 WHY ARE ELECTRICITY COSTS RISING?

■ **We haven't paid the true price for power for decades** - Through the 1990s prices charged to consumers were lower than costs to produce. When market opened prices sky rocketed so government set rates to 2001 levels. The revenue from consumers simply was not enough to cover the overall costs.

■ **We are paying for this now as part of the debt reduction portion on our bills.**

The stranded debt increased \$1.1 billion from April, 1999 to March, 2004 due to the government funded price freeze (\$900 million), temporary additional power generation in 2003 (\$70 million) and underperformance/higher costs of OPG units, particularly nuclear.

■ **Sell off of some OPG heritage assets** - When all assets were under the umbrella of Ontario Hydro, higher cost power could be subsidized by lower cost. During early deregulation, some hydro assets - low cost/high value power producers - were sold at a fraction of their price to private generators. (Income from the sale was not used to reduce overall debt) Power was purchased back at inflated rates. (i.e. Mississauga River hydro)

■ **Reduced lease payments from Bruce Power** - OPG leased the Bruce Nuclear facility to Bruce Power in 2002 for an annual fee of \$25.5 million/unit (4 units), subject to inflation adjustment. Lease payments were intended to offset the cost that the public was required to pay for power generated from Pickering and Darlington nuclear units. In 2005 the government reduced the lease payments from the \$27.4 million/unit to \$6 million/unit. According to the Auditor General, "*the original lease amount would have afforded an opportunity for the price that ratepayers pay for OPG energy to be lowered*".

■ **Inflation costs built into private contracts** - Many of the contracts with private generators include escalation clauses based on increases in the Consumer Price Index (CPI). This will continue. For example, the Bruce Power contract allows for a higher rate of CPI calculation which effectively "*trades off lower prices in the earlier years for higher prices in later years*". (Auditor General)

■ **Administration Escalation** - 5 agencies with overlap and duplication of function have been spun from the former Ontario Hydro - increase in over \$1 Billion (2007) in spending - now costs \$3.5 billion/year to administer the electricity system i.e. Ontario Power Generation, Hydro One, Ontario Power Authority, Independent Electricity System Operator, Ontario Energy Board.

■ **Costs for the Ontario Power Authority (OPA) have more than quadrupled** since its inception in 2005. Costs increased from \$14 million in 2005; \$31 million in 2006; \$57.4 million in 2007 and the estimated budget for 2010 is a whopping **\$65.1** million! Salaries paid out for OPA employees in the "\$100,000.00+/yr club" totaled \$10 million in 2008.



■ **The Integrated Power System Plan (IPSP)** – Initiated by the OPA, the 20 year power plan had been extensively and expensively developed and had been delivered to the OEB for approval (summer, 2008). This plan, which cost hundreds of millions of dollars, has been indefinitely shelved. The government is making all decisions.

■ **Coal fired power not setting market price as often** – Due to the government’s coal closure regulation, OPG has been forced to artificially inflate the price of coal-fired power generation – adjusting for carbon costs – in order to bid into the market at higher cost. This has allowed natural gas fired generation to be more competitive in the market. This raises the overall market price when gas prices are higher.

■ **Transmission upgrades** – example, \$60 million to connect Greenfield and St. Clair Power (Invenergy), near Sarnia – only \$6 million is recoverable from private generators; \$600 million assessed for lines from the Bruce to the GTA  
Costs for transmission are rising. Hydro One recently received approval from the Ontario Energy Board to increase rates, according to consumer class. For the average homeowner, delivery rates will rise 3.3% this year; 7.3% in 2010 and an estimated 13.3% in 2011. Average rates for farmers will rise 3.3% in 2009; 9.2% in 2010. Some communities will be hit with much higher rates – 20%-25% increase in delivery costs. (i.e. Wyoming, Forest – Hydro One has a list of communities impacted by these higher rates)

■ **Assessing costs is difficult.** Contracts made with private power producers (not open to public scrutiny) and a lack of transparency regarding debt, assets and accounting in the provincial energy sector obfuscates cost evaluations.

■ **The system that has evolved in Ontario – the mix of market and contracts** – has the disadvantage of costing for administration of 2 systems - a wholesale market and a procurement-based system (government/OPA contracts). The OPA and IESO, the 2 agencies administering these systems, have operating budgets which total more than \$190 million annually.

■ In 2009 **OPG received approval to raise the rates** on its regulated nuclear and hydro generation approximately 11%. This rate increase impacts baseload generation costs, 40% of the resource mix. (see page 19)

■ **Recent contracts with private power generators** – This is likely the single biggest reason that costs are now rising – and will continue to do so. The path taken to open the market in Ontario has had costly consequences. It was deemed necessary to breakup Ontario Hydro to remove the utility’s monopoly on power generation. This deregulation took place 2000-2002. In the meantime, the U.S. power market was faltering, deregulation was proving to be a mistake in jurisdictions that proceeded with it. Private investment in the Ontario market was not happening. These factors combined with the new Ontario government’s pledge, in 2004, to eliminate coal-fired generation by 2007 caused the government to go into panic mode to ensure new private power generation.

- In order to induce investment in Ontario, the provincial government chose to negotiate directly with private power producers, offering generous contracts for minimum support payments. Incentives were included – at taxpayers and

ratepayers expense, including bonuses, corporate tax write-offs, sales tax exemptions for building materials, natural gas exemption from Ontario fuel taxes, etc. – guaranteed 20 year contracts – minimum monthly “support” payments

- Inherent flaws, noted by the federal research service should have been cautionary - *“Rather than push ahead with fundamental electricity market reforms, the Government of Ontario has opted to focus its efforts on contracting directly with the private sector to build new generating capacity. This approach entails potentially significant financial risks for the province and, ultimately, for the electricity ratepayers and taxpayers of Ontario, as the province is providing investment guarantees to private-sector electricity generators in an effort to attract investments.”* (Parliamentary Information and Research Service – “Ontario’s Electricity System, September 22, 2005)

- The Ontario Power Authority was directed by the government where, when and what power generation to procure. However, *“generators were able to extract a premium for agreeing to construct new generation when the government was desperate to ensure adequate power supplies: What has the government’s policy induced crisis wrought? It has led to . . . the Ontario Power Authority entering into numerous deals to secure replacement generation . . . in order to rush ahead with new generation to deal with the self-inflicted crisis. In this instance . . . everyone on the other side of the deal knows the government is in panic mode.”* (C.D. Howe Institute, Power Failure: Addressing the Causes of Underinvestment, Inefficiency and Governance Problems in Ontario’s Electricity Sector, Michael Wyman, May, 2008)

- *“Many of the OPA’s contracts result in a significant amount of market and technology risks being borne by the OPA and, indirectly, Ontario ratepayers. Most of the 2005/2006 contracts for new natural gas capacity gave generators a right to support payments covering their fixed costs (and other payments covering certain aspects of their variable costs) regardless of the future direction of spot market prices ... Central procurement contracts in practice frequently result in buyers paying prices significantly exceeding spot market prices, in spite of the fact that buyers bear the risks just discussed.”* (C.D. Howe Institute, Power Failure)

The power projects that were the early recipients of these contracts have recently entered the market so the impact is beginning to affect consumer costs. These contracts directly affect the “provincial benefit” paid or charged to consumers. This has a large – and increasing – impact on electricity costs. See pages 15-18, 34.

■ According to the OPA, contract prices for new generation secured through the OPA, prices for small scale distributed generation, and prices for non-utility generation are all generally higher than market price for power.

Since it was introduced in 2005, the “provincial benefit” has had the following impact on consumer prices (¢/kWh):  
2005 credit .75      2006 charge .44      2007 charge .40      2008 charge .61      2009 charge 2.91

(High 2005 costs were due to extreme summer temperatures – natural gas setting market price. These costs were offset by a credit on the billing. All generators in the queue received the high market price and the excess, over the contracted, regulated or capped rates was rebated to consumers.)

## 2.1 THE COST OF ELECTRICITY – WHO PAYS WHAT?

- More than ½ of electricity consumed – the “commodity cost” - in Ontario is paid for:
  - by low-volume consumers - residential (including apartment buildings, condominiums), small businesses, farms, designated charities and the larger volume “MUSH” sector;
  - according to regulated rates set by the Ontario Energy Board (OEB);
  - rates and the threshold are revised every six months, May and November;
  - rates are based on the electricity supply costs forecast for the year ahead, plus adjustments to account for the differences between what was paid and what supplies actually cost over the previous 6 month period;

These consumers have the option of contracting with a private power retailer, or switching to the hourly price, with the associated credits or costs.

- The remaining ½ of provincial electricity consumed is paid for at wholesale rates by large volume consumers. (See page 11.)

### **1. RESIDENTIAL AND SMALL BUSINESS** – Are on a Regulated Price Plan (RPP)

#### ■ Residential Users

Summer Cost (May 1- Oct 31)

5.8 ¢/kWh for the first 600 kWh in a month

6.7 ¢/kWh for each additional kWh

Winter Cost (Nov 1 – April 30)

5.8 ¢/kWh for the first 1000 kWh in a month

6.7 ¢/kWh for each additional kWh

#### ■ Low-volume Business Users (commercial, farmers, businesses that use <250,000 kWh/year)

5.8 ¢/kWh for the first 750 kWh in a month\*

6.7 ¢/kWh for each additional kWh

\* The 750 kWh threshold for these customers does not change throughout the year.

\*\* Electricity consumed – shown on the electricity bill as kWh usage - is multiplied by an “adjustment factor” which is paid by consumers to compensate for “line losses” - electricity consumed by the transmission equipment, wires and transformers.

## 2. THE “MUSH” SECTOR – Municipalities, Universities, Schools, Hospitals

This sector paid the regulated rate (fixed price), the same as low volume consumers, with the option to pay wholesale market price until November, 2009.

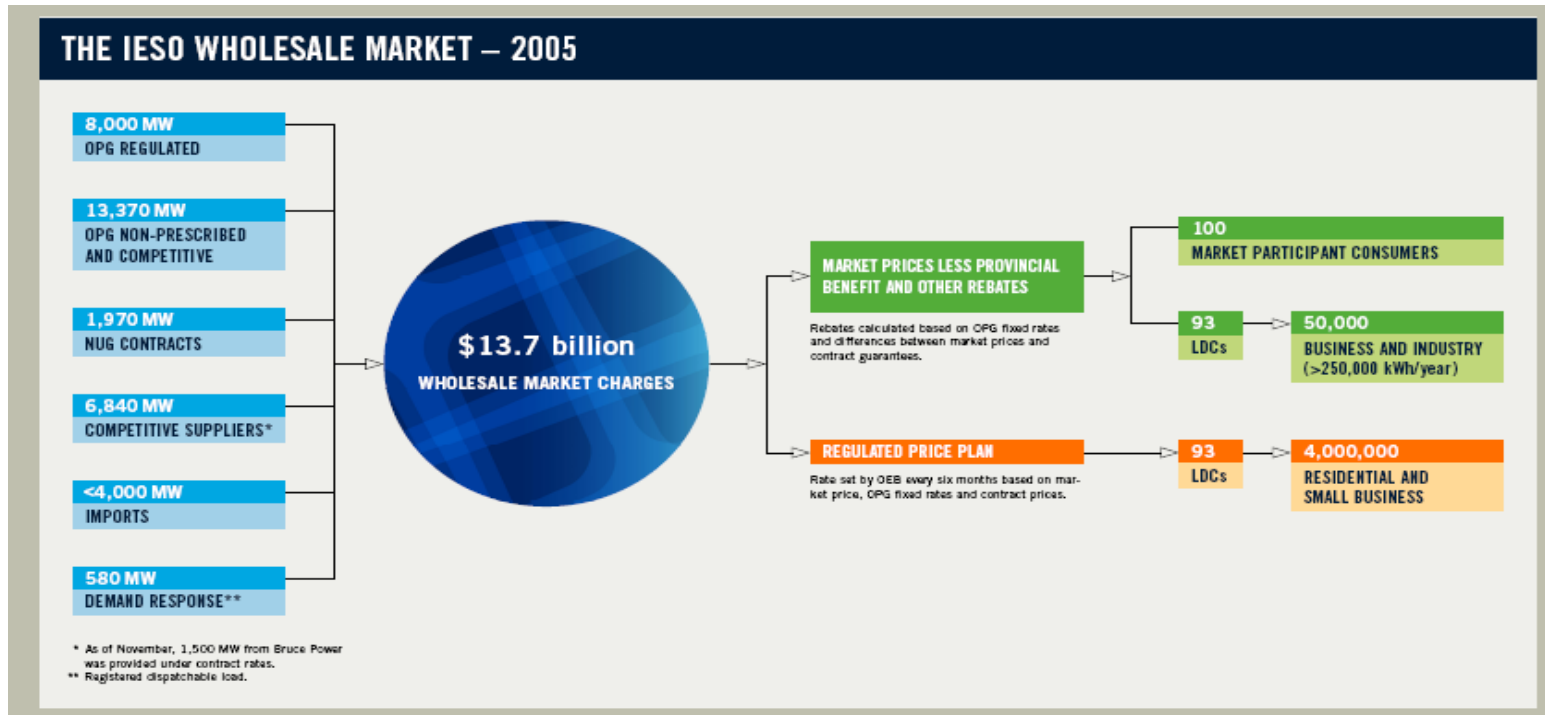
Now they pay the wholesale market price, plus adjustments (Provincial Benefit).

Although this will save these consumers from the price hikes during peak and mid-peak hours once Smart Meters are installed, they will be subject to the volatility and increasing costs of the wholesale market. This will impact both provincial and municipal taxes, the source of revenue for this sector.

## 3. INDUSTRIAL/MANUFACTURING & Other Large Volume Users – Pay wholesale market price

Those who consume more than 250,000 kWh a year - Industrial facilities, large retail operations such as supermarkets or department stores and other medium and large-sized businesses

\*\* Those that pay the wholesale market price have their bills adjusted to reflect the true cost of power. The Provincial Benefit and the OPG rebate (now cancelled) are included as either a credit, or charge. (See pages 15 – 17.)



## **BUT – THAT’S ONLY HALF THE STORY**

The commodity cost – the electricity used - represents roughly half of the overall charges shown on an electricity bill. The other half is made up of delivery, transmission, regulatory, and debt reduction charges. Some of these are based on electricity used, others are fixed costs.

Each kWh of electricity consumed is multiplied by the following:

- **Regulatory charges** – 0.62¢/kWh – primarily for services required to operate our electricity market.
- **Debt-retirement charge** – 0.7¢/kWh – to pay down the residual stranded debt of the former Ontario Hydro.

**Delivery charges** (for transmission and distribution) – vary from utility to utility. A portion of these costs are fixed. Regardless of how much a consumer conserves, these charges cannot be reduced.

**gst** @ 5% is added to the bill; **pst** @ 8% will be included as of July, 2010.

The following are 2 examples of an “average” residential bill:

### **1. Local Distribution Company Customer - Jan. 2009**

Electricity up to 1000 Kw. @ 0.56 =	\$56.00	
Electricity over 1000 Kw. @ 0.65 =	\$ 4.33	
total electricity =	\$ 60.33	47.46% of overall bill
<b>Delivery ----- =</b>	<b>\$ 52.86</b>	<b>41.58% of overall bill</b>
Regulatory charges----- =	\$ 6.86	5.4% of overall bill
Debt Retirement Charge----- =	\$ 7.07	5.56% of overall bill
January, 2009 TOTAL =	\$ 127.12	

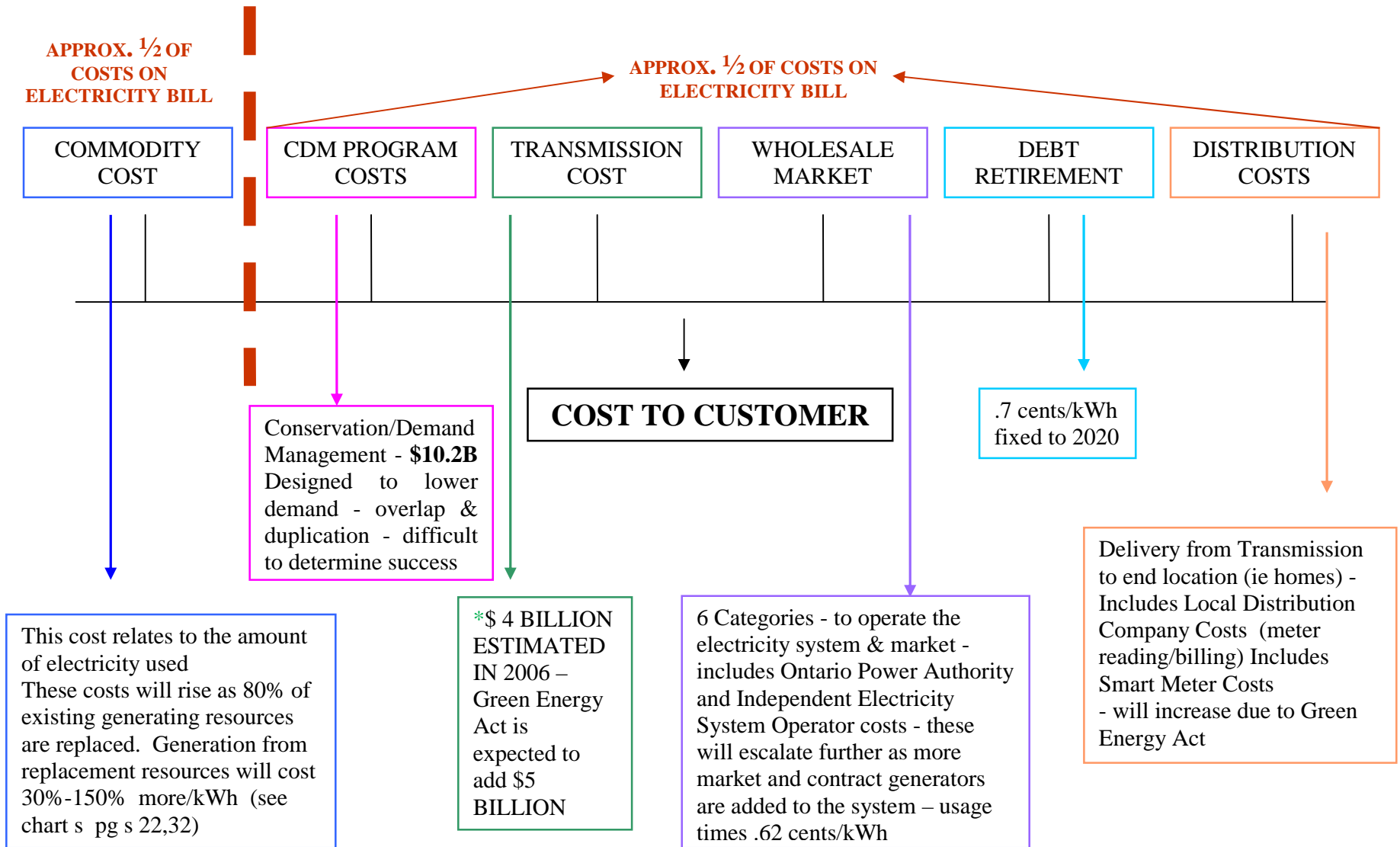
\* Recent Hydro one increases and 2010 increases will impact delivery costs – see pg 8 “Transmission Upgrades”

### **2. Hydro One Customer**

Electricity:	42.17	43.50% of overall bill
<b>Delivery</b>	<b>44.74</b>	<b>46.17% of overall bill</b>
Regulatory Charges	5.04	5.2% of overall bill
Debt Retirement Charge	4.96	5.12 % of overall bill
January, 2009 TOTAL =	\$96.91	

The chart on the following page describes the breakdown of charges included on the ratepayers’ bill:

## 2.2 ELECTRICITY SERVICE COST TO CONSUMER



- The OPA reported \$45.5 Billion cost for new generating resources - capital costs alone
- The current revenue from all electricity bills in Ontario is \$13 Billion annually - Over a 20 year period, capital costs alone will require an additional \$3 Billion per year, an additional 25% annually
- \*Transmission cost estimates do not include indirect costs associated with transmission such as “overhead, escalation, contingency and interest during construction” nor the OM&A costs

## **2.3 HOW IS COMMODITY PRICE DETERMINED?**

The commodity cost is the price for power actually used by a consumer and represents about ½ of the electricity bill. For residential and other lower volume users, the price is calculated based on the kWh used multiplied by the regulated rate, as shown on page 10.

For large consumers (in excess of 250,000 kWh/year) the power price is calculated based on the market price at the time the power was consumed. The market price is determined as follows:

1. The Independent Electricity System Operator (IESO\*) determines electricity needs for the following day, plus a reserve. (Accurate within about 2%)
2. Power generators determine how much of that load they can supply and at what price. They make an offer of supply and price to the IESO.
3. The IESO matches demand with available supply based on lowest cost first. Offers are accepted from lowest cost to highest bid until the electricity demands are met. All suppliers – regardless of the price they offered – receive the highest price – the last offer accepted. This price is called the “Market Clearing Price”.
4. The IESO accepts bids until about 2 hours before the power is needed, adjusting for weather and demand. The IESO instructs the successful bidders when to generate power for the system.
5. The IESO runs a “real-time” market, i.e. purchases of electricity are made when needed.
6. The Market Clearing Price approach should ensure the lowest possible price while maintaining reliability of the system. This however is complicated by the need to pay power suppliers set contract prices. (see next page)
7. For a more detailed explanation, visit [www.ieso.ca](http://www.ieso.ca)

## **2.4 IF ONLY IT WERE THAT EASY ...**

Power producers in Ontario include a mix of:

- Ontario Power Generation (OPG) – resources include nuclear, hydraulic, coal, natural gas;
- private power producers who had existing contracts prior to deregulation (NUGS);
- private power producers who have made contracts with the Ontario Power Authority since 2004; and
- renewable electricity producers who are paid a set rate for each kWh of electricity generated, i.e. wind, solar.

The IESO pays each of these producers for power generated and sold into the Ontario market according to determined prices, as described below. If the market price is not sufficient to cover these guaranteed prices, electricity customers are charged an additional rate per kWh to make up the difference. If the market price is higher than what is required to satisfy the costs of all the power producers, a credit is given to consumers. These price adjustments are called the “provincial benefit/global adjustment” and “OPG rebate”.

\*\* These charges or credits apply only to those large electricity consumers (those whose use exceeds 250,000 kWh/year) who pay market price for electricity. It is already factored into the regulated price for low volume consumers (residential, small business).

### **(1) Provincial Benefit** – (“Global Adjustment” – aka “dumping ground for expensive deals”)

■ The Provincial Benefit – also known as the Global Adjustment - is either a charge or a credit included in the billing of large consumers at the “electricity” line of the bill. The Provincial Benefit also includes OPA costs for conservation/demand management programs as well as other OPA administrative costs.

■ The Provincial Benefit represents the difference between market prices and:

(i) OPG’s regulated baseload generation (OPG nuclear and Niagara group of hydro plants) - OPG offers energy from these regulated generators into the market. If their net revenue is less than the regulated price, they receive whatever extra payments are needed to meet that price. If their revenue is more than the contract price, they pay back the excess;

(ii) Payments made to suppliers (including demand reduction) that were awarded contracts with the Ontario Power Authority – ( If the net revenue received by the generators from the market is less than or exceeds that agreed-upon revenue, generators will either receive whatever support payments are needed to achieve the guaranteed price, or will be required to pay back excess revenue);

(iii) Contracted rates paid to Non-Utility (i.e. Non OPG) under contract before deregulation.

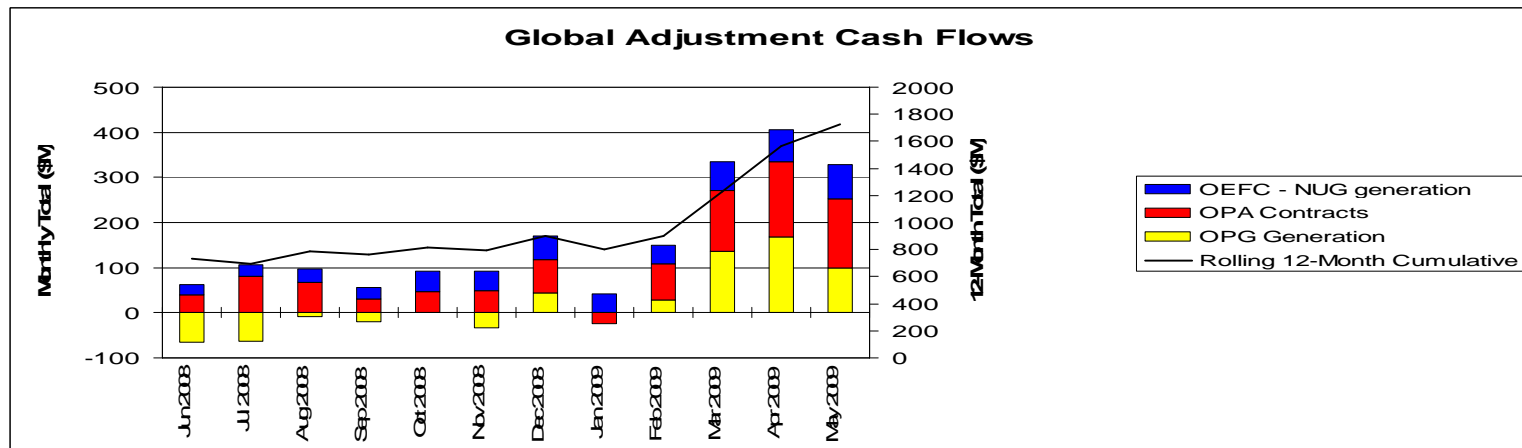
■ These costs were formerly paid through the Debt Retirement Charge.



■ The 2009 Provincial Benefit has been an additional **charge** per kWh of the following amounts:

	January	February	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Spot Market Price	5.32	4.72	2.89	1.84	2.78	2.28	1.90	2.84	2.21	3.03	2.76	3.60
Provincial Benefit	1.21	0.52	0.95	3.02	3.98	2.79	3.50	4.33	3.36	4.13	3.30	3.80
Total (¢/kWh)	6.53	5.24	3.84	4.86	6.67	5.07	5.40	7.37	5.57	7.16	6.06	7.40

■ The breakdown of payments included in the Global Adjustment are shown on the following chart. Positive values indicate charges to customers, negative values indicate credits. See page 34 regarding the cost impacts.



(OPA – Global Adjustment website presentation May, 2009)

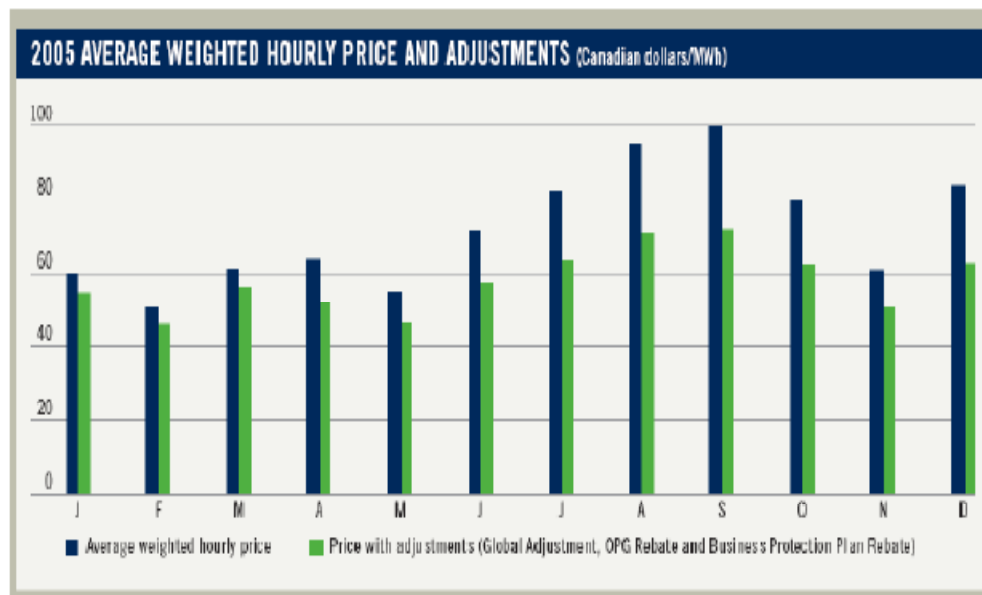
**Conclusion:** Although market rates are lower this year due to decreased industrial demand, high availability of generating resources and temperate weather, the above information demonstrates that lower market price has not been of benefit to the consumer. The market price is insufficient to cover the cost of contracted or regulated prices. In some months the “adjustments” to the bill are actually higher than the average market price.

**(2) OPG Rebate** - Some of OPG’s generating assets – 85 % of the output from its coal-fired and smaller hydroelectric operations – received a “capped rate” of 4.8 ¢/kWh for electricity produced. Anything earned on the market above that rate is rebated back to the consumers by way of “OPG Rebate”. This rebate ended April 30, 2009.

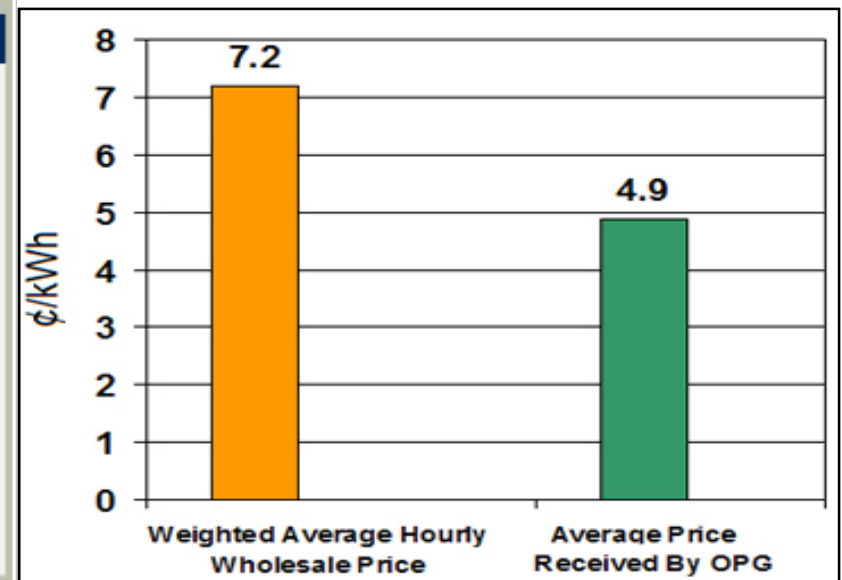
■ With this rebate removed, consumers have lost the mitigating impact of the capped rate on 20% of the provincial generating assets. The impact of the rebate is shown on the following charts.

Period	Rebate Rate (\$/MWh)
February 1, 2009 - April 30, 2009	-1.71
November 1, 2008 - January 31, 2009	1.55
August 1, 2008 - October 31, 2008	1.52
May 1, 2008 - July 31, 2008	2.89
February 1, 2008 - April 30, 2008	2.53
November 1, 2007 - January 31, 2008	0.75
August 1, 2007 - October 31, 2007	1.82
May 1, 2007 - July 31, 2007	0.50
February 1, 2007 - April 30, 2007	2.69
November 1, 2006 - January 31, 2007	0.70
August 1, 2006 - October 31, 2006	0.62
May 1, 2006 - July 31, 2006	1.54
January 1, 2006 - April 30, 2006	1.27
April 1, 2005 - December 31, 2005	6.52

■ The following charts demonstrate the impact of the average hourly price (blue) and the mitigating effect of the global adjustment and OPG rebate. The 2005 costs for generation reflect higher costs associated with a warmer summer, lower hydroelectric production and the impact of natural gas-fired generation setting market price more frequently. OPG assets were instrumental in lowered costs for consumers.



IESO



Moderating Prices – 2005 Electricity Rates – opg.com

■ The impact of the Provincial Benefit and OPG Rebate is shown below: (¢/kWh).

	2002	2003	2004	2005	2006	2007	2008	2009
Hourly Load-Weighted Energy Price	5.59	5.76	5.22	7.21	4.88	5.05	5.17	3.16
Rebates	-0.66	-1.01	-0.69	-0.67	-0.11	-0.12	-0.20	* 0
Global Adjustment				-0.75	+0.44	+0.40	+0.61	+2.91
Net Cost	4.93	4.76	4.53	5.79	5.21	5.33	5.58	6.07

■ In 2008 the adjustments (provincial benefit) on consumers' bills included: an OPG credit of \$190 million; a charge for OPA contracts of \$612 million and payments to non utility generators of \$480 million resulting in a net charge of \$901 million. The average market price in 2008 was 5.2 ¢/kWh (\$51.67/MWh). The global adjustment added an additional 0.6 ¢/kWh (\$6.14/MWh) to the overall consumer price.

**Additional Charges – Large Consumers** - Wholesale charges and transmission charges are significantly higher in Ontario than other jurisdictions.

■ The delivered price of electricity to industrial consumers includes electricity prices plus:

- transmission and ancillary charges (e.g., costs of operating reserve, regulation and market administration). These additional charges add another **\$13 - \$17/MWh**;

- debt retirement charge of **\$7.00/MWh**;

- distribution costs charged by local distribution companies. These costs as shown below have increased dramatically since 2005. Of all the elements of a customer's bill, distribution costs in Ontario are rising the most rapidly – 20%.

“...delivered industrial electricity prices in Ontario have **increased over 60% since 2001**” ... “Ontario has experienced a serious erosion of its competitive price advantage in industrial electricity over the last 5 years, to the extent that in many cases ... it has become a price disadvantage.” (Navigant Consulting, “Ontario Electricity Rates and Industrial Competitiveness”)

**Table 3 Average Distribution Costs for Industrial Customers**

Year	2002	2003	2004	2005	2006	2007
Distribution Cost (\$CDN/MWh)	6.60	6.97	6.69	7.40	8.11	8.66
Distribution Cost (2002 \$CDN)	6.60	6.79	6.36	6.92	7.40	7.82
Change (year-over-year, 2002 \$CDN)	2.9%	-6.3%	8.8%	6.9%	5.7%	2.9%

32% overall  
increase  
2002-2007

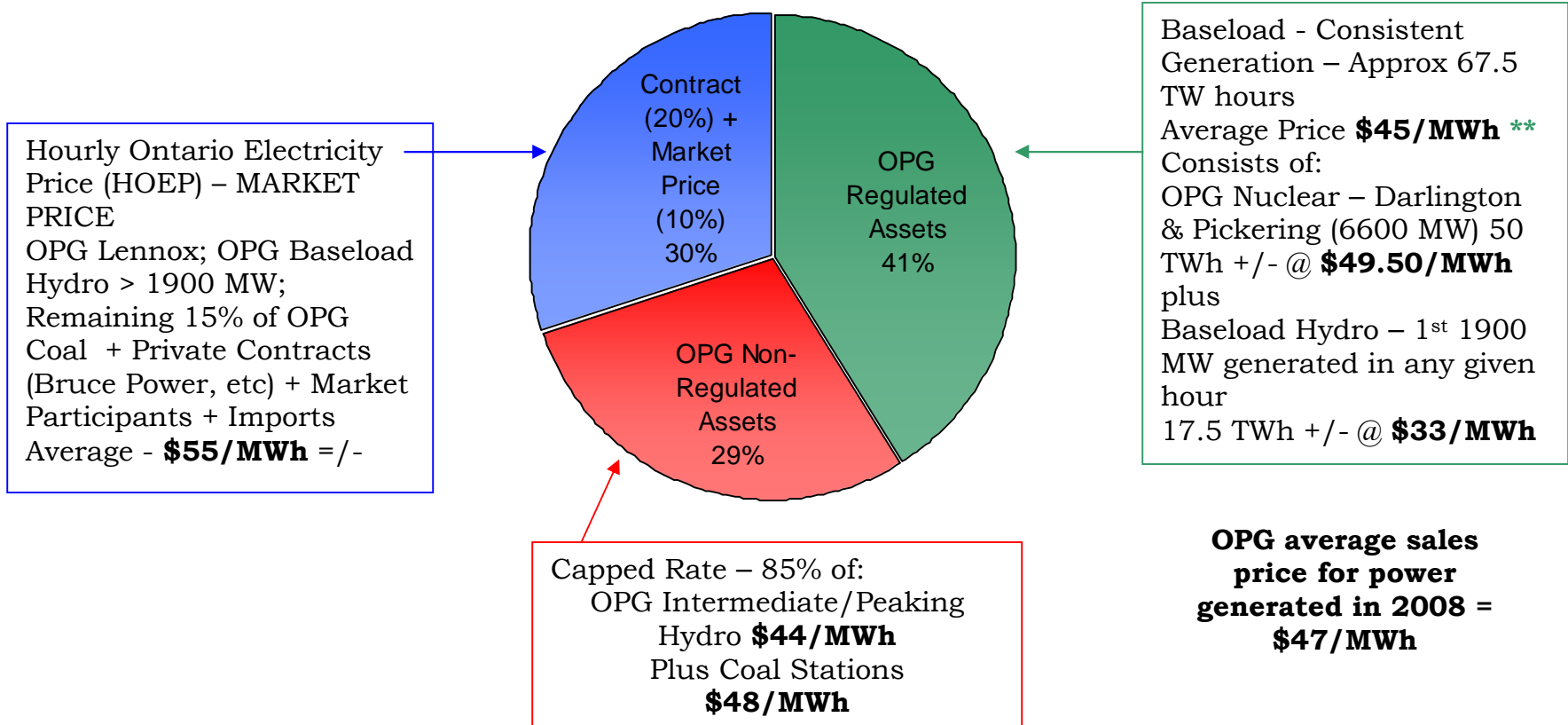
Source: Ontario Energy Board

(Association of Major Power Consumers of Ontario - Benchmarking Ontario's Electricity Competitiveness)

■ In addition, as noted above, large volume consumers have lost the mitigating impact of the OPG rebate.

## 2.5 COMMODITY COSTS – DETERMINING THE PRICE OF POWER PRODUCED

2008



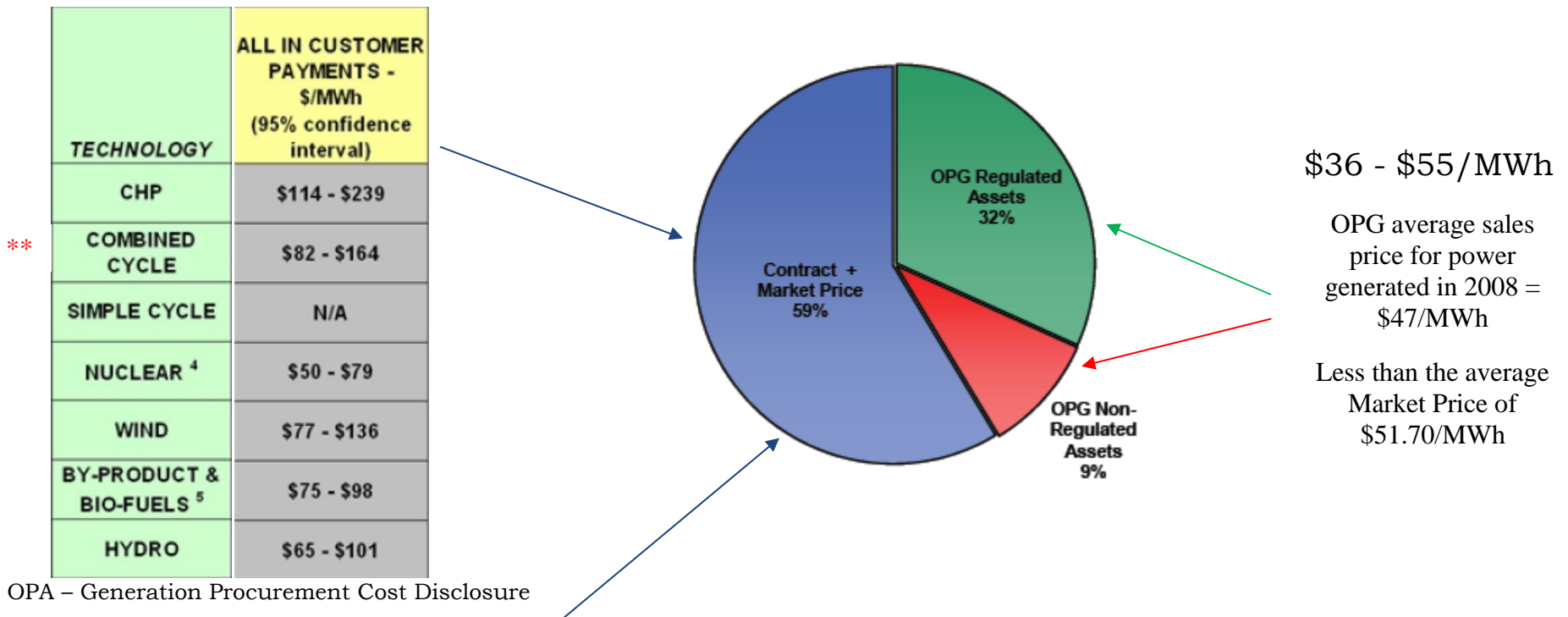
Until 2008, about 70% of the power consumed in Ontario was generated from OPG public assets at capped or regulated prices. The market price was set primarily by low cost coal (55+% of the time) and hydro (20+%), thereby mitigating the effect of market price.

As OPG assets are retired (i.e. coal plants, Pickering B- those in the red and green sections) the market portion (blue section) rises. Replacement generation comes from higher cost private generation and higher cost renewables, with nothing to offset these costlier resources. See chart on following page.

Market price will be set primarily by higher cost natural gas – about 85% of the time.

\*\*Recent changes – OPG nuclear \$55/MWh; OPG Baseload Hydro \$36/MWh

## COMMODITY COSTS – 2014 PROJECTION



Renewable – Feed in Tariff – Wind, solar etc  
 \$131 – \$820/MWh

The above chart shows the potential commodity price structure in 2014 once the coal fired power plants are removed from service, and the Pickering B units not slated for refurbishment. This will change further – 2016-2020 – once further OPG nuclear assets are removed from service.

As noted, OPG average sales price for power generated in 2008 was less than the average Market Price of \$51.70/MWh. Contract prices for all types of new generation are higher than market price for power (OPA). Bottom line – higher cost for electricity as OPG units are retired and new generation is added to the supply mix.

## **2.6 PRESENT POWER USE IN ONTARIO**

### ■ Power Use by Sector:

Commercial Use (heating, cooling, lighting) – approximately 39%

Residential Use – approximately 33% of provincial total

Industrial Use – 28%

### ■ Requirements:

Baseload (minimum daily use) approximately 13,000 MW – nuclear and hydro

Average daily demand – 17,500 MW

Highest load recorded – 27,005 MW August 1, 2006

Highest winter peak demand – 25,868 February 13, 2007

### ■ Resource Statistics:

Installed capacity of generating resources - approximately 31,000 MW

Transmission – approximately 123,000 km of power lines

The Ontario's high voltage transmission system has interconnections with Manitoba, Quebec, New York, Michigan and Minnesota through 12 lines with 4000 MW capacity (increase of 1250 MW with Quebec tie-in).

## **Power Use in 2008**

Ontario's annual energy use was 148 terawatt hours (TWh), down by 2.3 % compared to 2007

Ontario Energy Production 159.3 TWh - Exports: 22.2 TWh - Imports: 11.3 TWh - Net Exports: 10.9 TWh

### Generation by Fuel Type:

53% from Nuclear (84.4 TWh)

24.1% from Hydroelectric (38.3 TWh)

14.5% from Coal (23.2 TWh – the lowest since 1996 – 18% less than the 28.1 TWh produced in 2007)

6.9% from Gas/Oil (11 TWh)

0.9% from Wind (1.4 TWh)

0.6% from Other Sources (1 TWh) (0% from solar)

Demand Figures: - Peak demand: 24,195 megawatts (MW) - June 9, 2008

Annual energy use: 148 TWh - Four hours when demand was greater than 24,000 MW (compared to 62 hours in 2007) - 44 hours when demand was less than 12,000 MW (compared to 27 hours in 2007)

2008 Electricity Prices: \$51.67/MWh or 5.2 ¢/kWh up slightly from \$50.51/MWh in 2007

### 3.0 WHERE ARE WE HEADED? UP, UP AND AWAY

Prices will rise for many reasons. We have included the following 7 reasons:

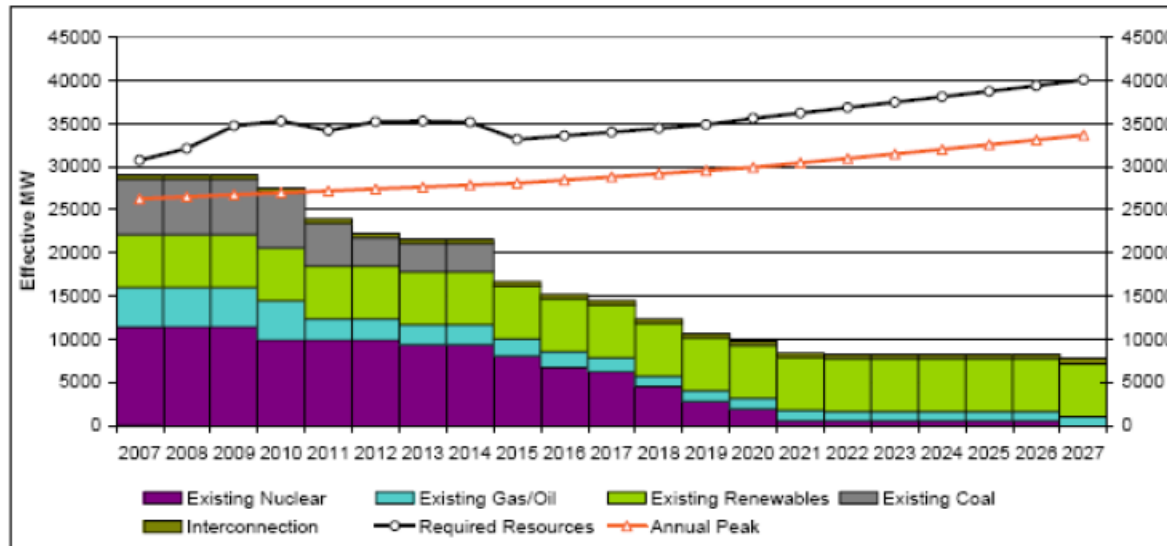
#### 3.1 HIGHER COST OF NEW AND REPLACEMENT RESOURCES

- 80% of resource supply will be replaced with higher cost renewable energy, natural gas, new/refurbished nuclear, conservation/demand management programs

- The revenue from all electricity bills from all sectors (residential, commercial and industrial) amounts to about \$13 Billion annually. The increased costs in each of the components of a consumer's bill, cannot be recovered without significant increases in the annual revenue which signals higher electricity bills.

Ratepayers are still being charged for existing assets – some of which are nearing end of life (Pickering nuclear) – and Ontario is committing to expensive new resources – with less overall system reliability. This is comparable to purchasing a new luxury car – on credit - while still paying off the old one!!

**Figure 1: Modification of Figure 1 in Exhibit D-3-1 “Contribution of Existing Resources Towards Resource Requirements (Effective MW)”**



Source: OPA

(EB-2007-0707 Exhibit I Tab 38 Schedule 31 Page 2 of 3 Filed: June 18, 2008)

■ Many of the non-utility generation contracts will expire middle of next decade – new contracts will be made at higher prices.

**EXAMPLE:** (COSTS/MWh – Replacement costs are obtained from OPA – "Contracts operational characteristics and All in Customer Payments by technology")

Note that many of the contracts have built in CPI increases – some high

<b>EXISTING RESOURCE</b>	<b>COST</b>	<b>REPLACEMENT/ADDITION</b>	<b>COST</b>
6,434 MW COAL	\$48	6,000 – 8,000 MW new NATURAL GAS	\$82 - \$164 (combined cycle) \$114 - \$239 CHP
3100 MW NUCLEAR (Pickering 2020)	\$55	NUCLEAR	\$79 ++
3500 MW NUCLEAR (Darlington)	\$55	refurbished	? +++
1500 MW		BRUCE REFURBISHED	\$79
850 MW HYDRO – private  (Compare with OPG Hydro @ \$36)		recent new contract	\$69 + peaking premium + annual increases
140 MW new Hydro			\$65 - \$101
WIND – proposed & actual 2,630 – 7,750 MW			\$135
SOLAR – 625 MW + planned & actual			\$443 - \$802

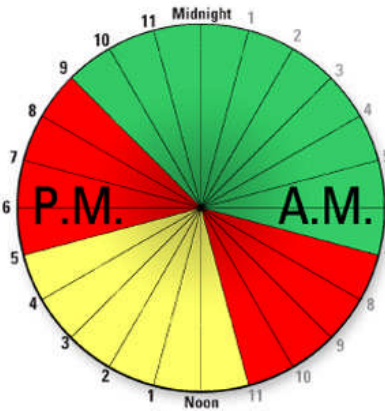


## 3.2 COST INCREASES DUE TO SMART METERS (Time of Use Pricing)

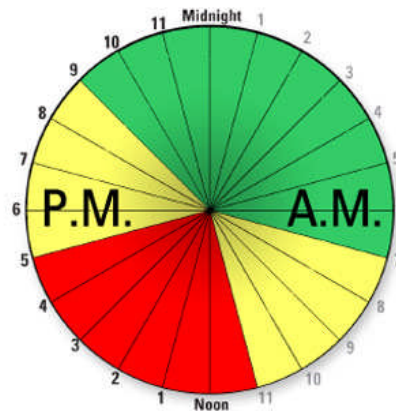
In 2010 - 2011, all residences and small businesses will be equipped with smart meters. Government regulations allow for the costs of smart meters to be recovered through the local distribution companies. Cost estimates indicate \$1.5 - \$2.3 Billion for meters and installation, plus monthly fees for information processing.

Time of Use pricing will be determined as follows:

Winter (Nov 1-Apr 30) - Weekdays



Summer (May 1-Oct 31) - Weekdays



**\*Weekends and Holidays – Off Peak 4.4 ¢/kWh**

**OFF-PEAK - 4.4 ¢/kWh**

**MID-PEAK – 8.0 ¢/kWh**

**ON-PEAK - 9.3 ¢/kWh**

COMPARISON OF PROPOSED RATES SINCE SMART METERS FIRST INTRODUCED

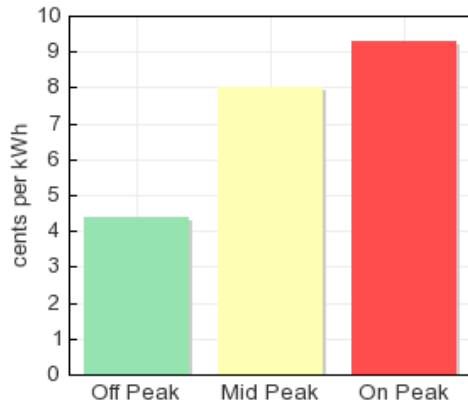
DATE	OFF-PEAK	MID-PEAK	ON-PEAK
NOVEMBER, 2009	4.4 ¢/kWh	8.0 ¢/kWh	9.3 ¢/kWh
MAY, 2009	4.2 ¢/kWh	7.6 ¢/kWh	9.1 ¢/kWh
NOVEMBER, 2008	4.0 ¢/kWh	7.2 ¢/kWh	8.8 ¢/kWh
MAY, 2008	2.7 ¢/kWh	7.3 ¢/kWh	9.3 ¢/kWh
MAY, 2007	3.2 ¢/kWh	7.2 ¢/kWh	9.2 ¢/kWh
NOVEMBER, 2006	3.4 ¢/kWh	7.1 ¢/kWh	9.7 ¢/kWh
2006	2.9 ¢/kWh (2.7	6.4 ¢/kWh 5.7	9.3 ¢/kWh 8.7)

Increase in projections: OFF-PEAK: **50%** higher  
MID-PEAK: **30%** higher  
ON-PEAK: **constant**

A winter mid peak – 8 pm – 10 pm - was eliminated in Nov 09. The on-peak price has been extended to 9 pm. Adjustments are made bi-annually by the Ontario Energy Board. (Current cost of electricity is approx. 5.8 ¢/kWh)

Initially time of use pricing was expected to follow a “1-2-3” pattern, i.e. 3¢/kWh off-peak; 6¢/kWh mid-peak; 9¢/kWh on-peak. Note, from the chart above right, there is now little price difference between mid-peak and on-peak.

Off-peak pricing is now higher than the regulated price from December, 2002 to April, 2004, then 4.3 ¢/kWh.



■ **The Summer Weekdays** - The highest energy prices occur over the afternoon, largely due to greater air-conditioning use. That's why the on-peak rate is from 11 a.m. to 5 p.m.

■ **The Winter Weekdays** - Energy prices peak twice—in the early morning and in the evening—mainly due to space heating, plus increased lighting and appliance use.

<http://www.ontario-hydro.com>

■ Smart Meter pricing does not take into account the highly diverse consumption profiles of different consumers. This pricing method will have major financial and lifestyle impacts on those with below average electricity demand and those least able to pay. These people will take the brunt of the pain while subsidizing those more able to pay.

A couple of examples: ([www.smartmetersontario.ca](http://www.smartmetersontario.ca))

**Clothes Dryers** - An average clothes dryer will consume up to 5 kilowatt-hours (kWh) for every hour of use. The only time of day that any savings will occur is by using the dryer from 10 pm to 7 am.

		Today per kWh		TOU per kWh		
Approx. Wattage		Tier 1 5.7¢	Tier 2 6.6¢	Off-peak 4.2¢	Mid-peak 7.6¢	On-peak 9.1¢
Clothes Dryer	5,000	28.50¢	33.00¢	21.00¢	38.00¢	45.50¢

These examples are based on rates prior to November, 2009)

**Electric Stove** – Little opportunity to switch cooking to off peak hours. Cooking will be more expensive.

		Today per kWh		TOU per kWh		
Approx. Wattage		Tier 1 5.7¢	Tier 2 6.6¢	Off-peak 4.2¢	Mid-peak 7.6¢	On-peak 9.1¢
Electric Oven	5,000	28.50¢	33.00¢	21.00¢	38.00¢	45.50¢
Electric Stove – Oven and 4 burners	12,500	71.25¢	82.50¢	52.50¢	95.00¢	113.75¢

## SMART METER IMPACT – BUSINESS

■ Smaller commercial users represent 40% of the consumers that will be impacted by Time of Use Pricing. When smart meters are implemented, these businesses will be hit with high rate increases - 37%-61% - during normal hours of operation. This will cause hardship for businesses unable to conserve or shift load during prime business hours. These costs will be passed on to the consumer.

■ In the following charts, the solid blue line shows the normal daily load curve – the higher sections of the curve represent higher daily use. The dotted blue line indicates the anticipated reduction in demand due to smart meters. Time of use pricing has been transposed onto these charts to show the cost for power at different times of the day.

Chart 1 – November 1 until April 30 – “Winter Use” - Normal small business operating hours are totally within mid and on peak hours of the day. (excludes weekends and holidays)

Average January Load Profile for Commercial Users – With and Without Smart Meters

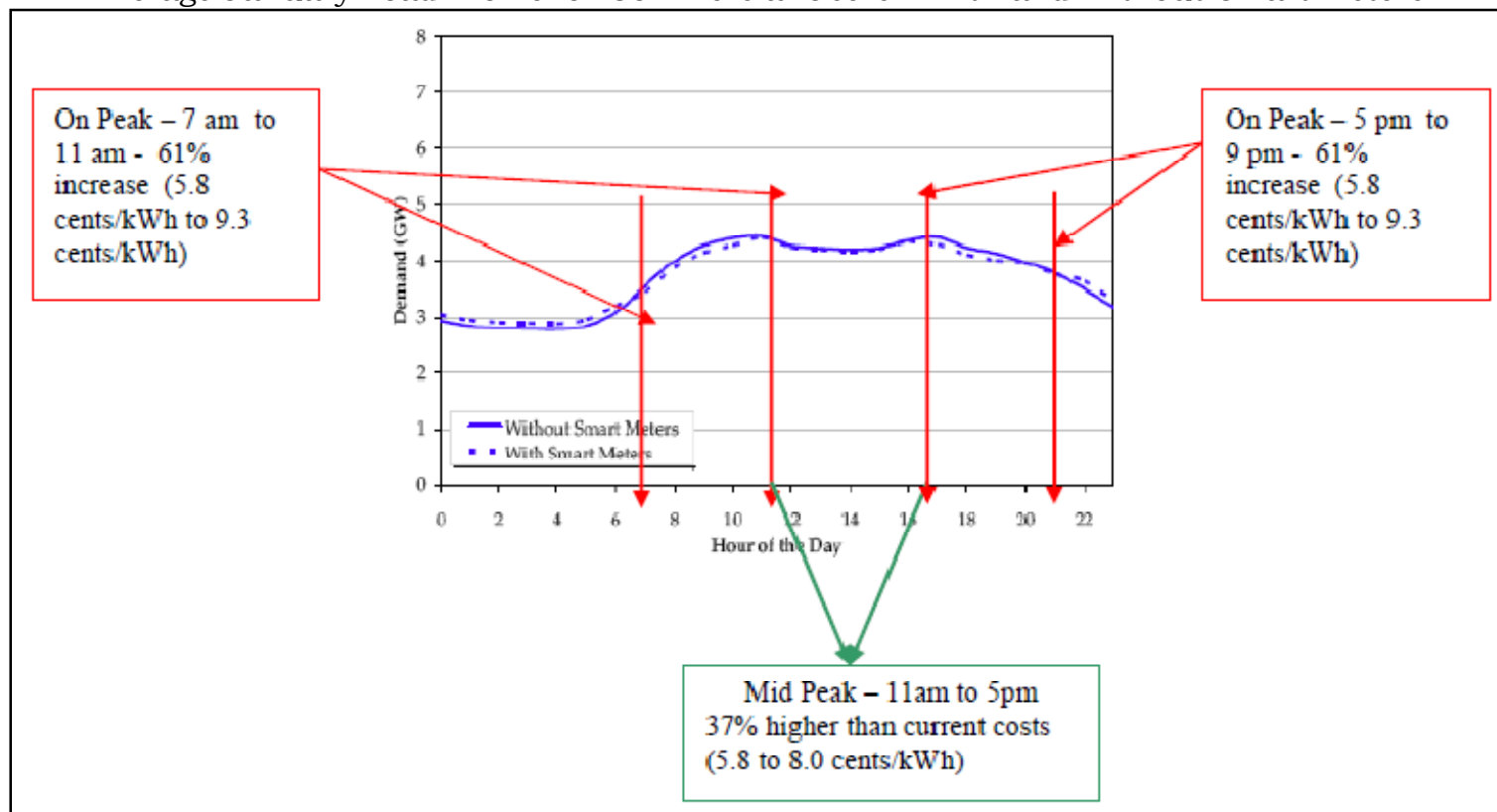
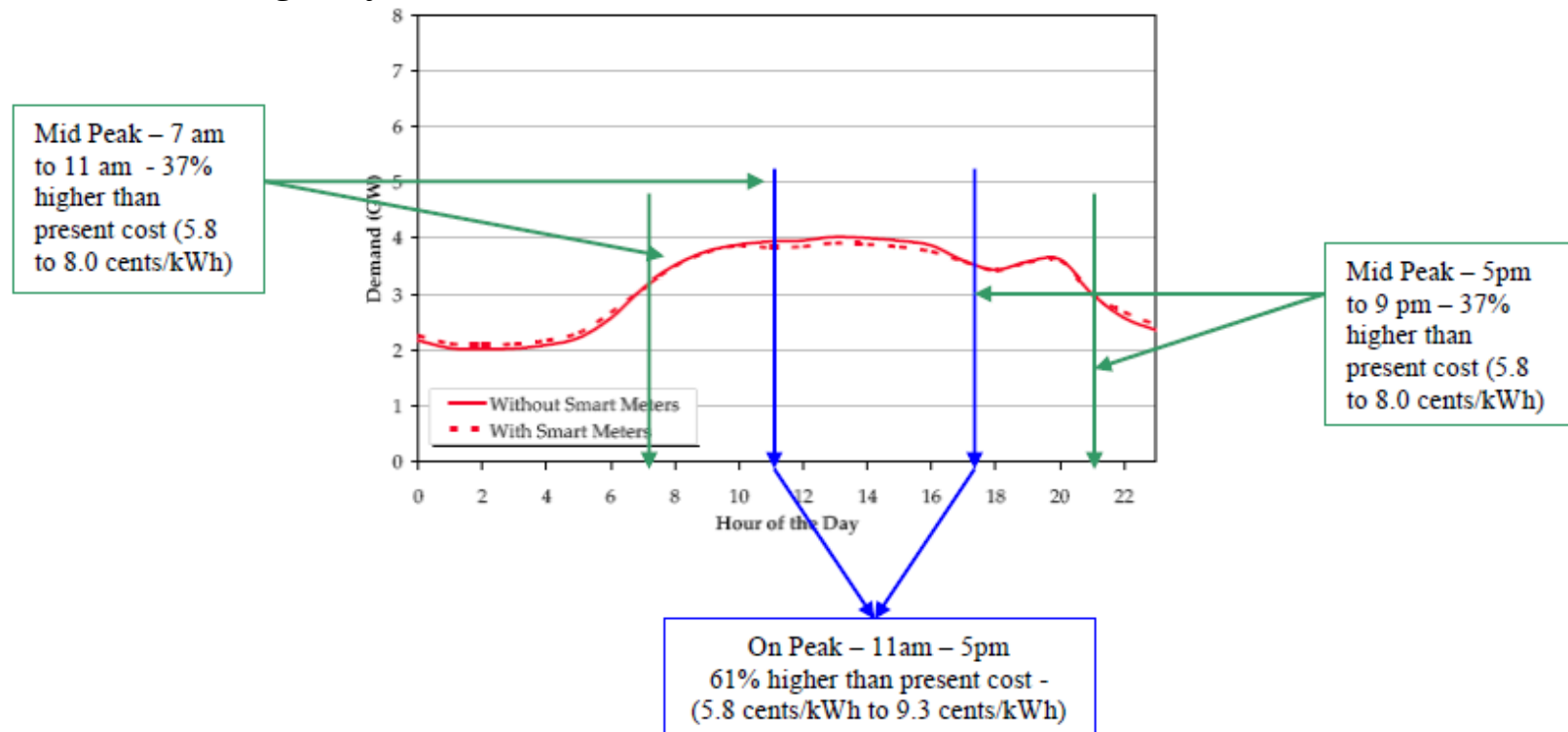


Chart 2 – May 1 to October 31 – “Summer Use” - Normal small business operating hours are primarily on peak hours, remainder on mid-peak of the day. Electricity prices for these businesses will increase by 61% for most hours, 37% for remainder.

Average July Load Profile for Commercial Users – With and Without Smart Meters



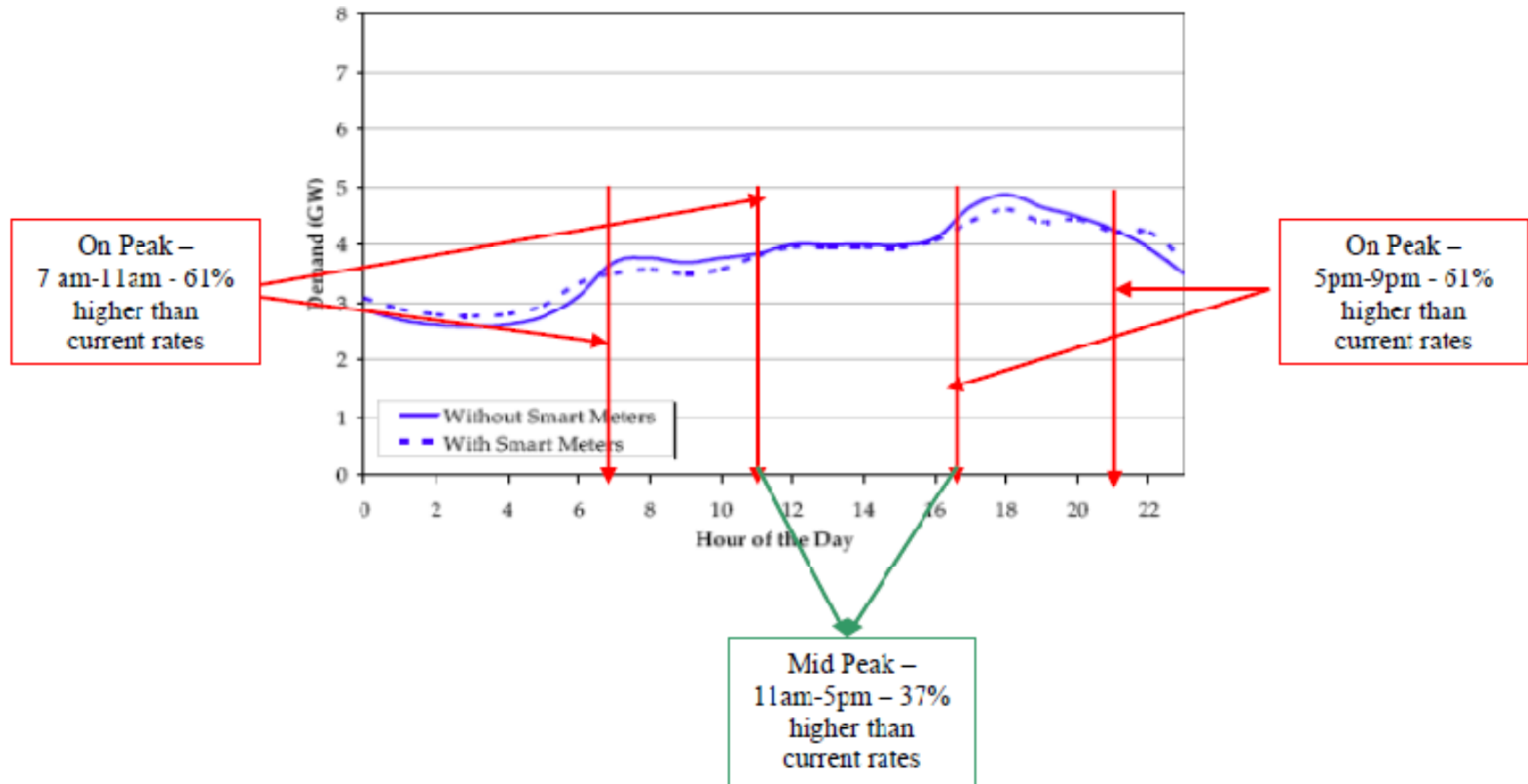
“Commercial customers report that peak usage is harder to curtail when critical business activity and electric use coincide with high price times. Also, businesses with high electricity intensity are less responsive than other customers. These findings seem to indicate that some businesses have less capacity to shift load simply due to the nature of their operations.” (Navigant Consulting)

As noted in the difference between the solid and dotted red lines representing the daily load use, there will be negligible difference in electricity use once smart meters are installed. Commercial on-peak demand is forecast to be reduced during a typical winter day by roughly 5% or 140 MW from its original peak at 5 pm. On a typical summer day, peak demand in the conventionally metered commercial sector is expected to be reduced by roughly 3% or 120 MW from its original peak at 1 pm. This reduction could be achieved in various other ways without high cost impact to Ontario’s small businesses.

# SMART METER IMPACT – RESIDENTIAL

Chart 1 – November 1 to April 30 – “Winter” Use

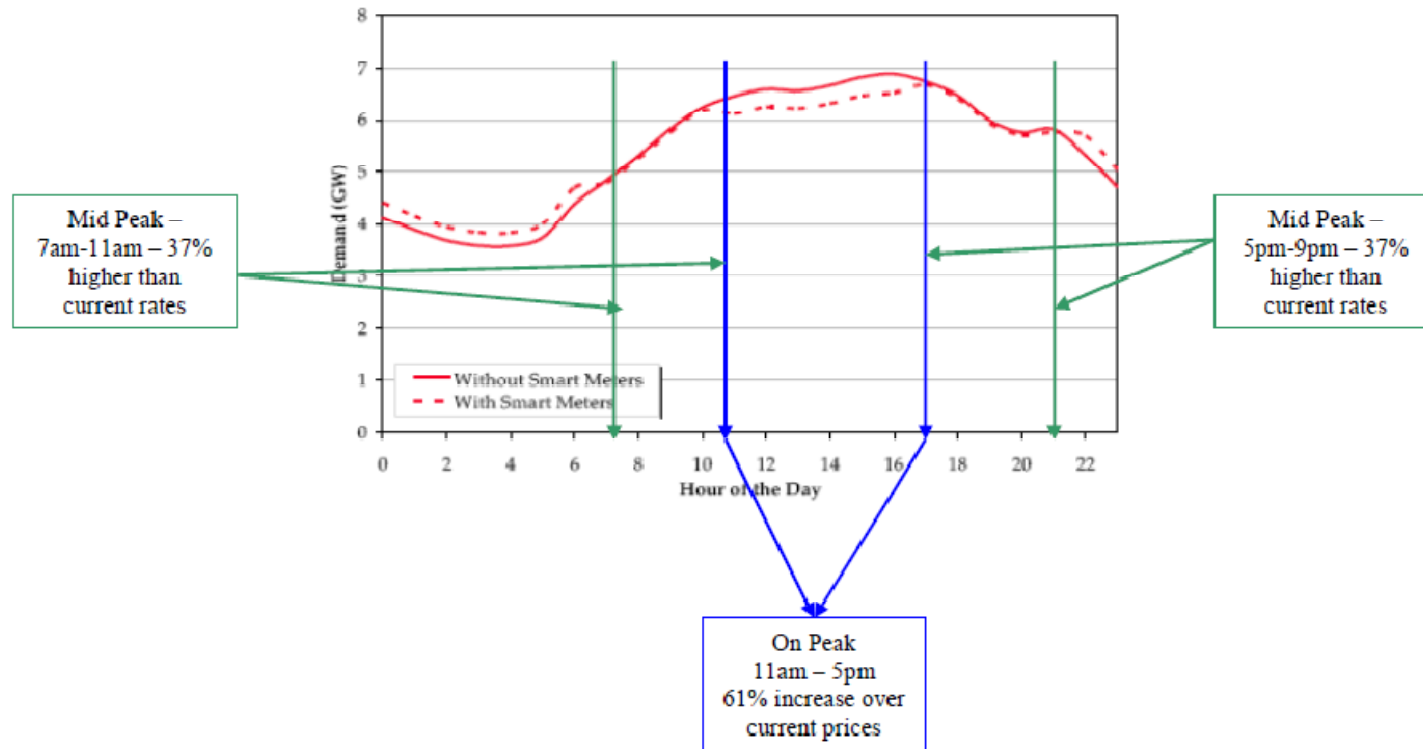
Average January Load Profile for Residential Users – With and Without Smart Meters



As this chart demonstrates, the highest TOU pricing coincides with increased demand in residential use due to normal activities during waking and pre-work/school preparation, etc. in the morning and arrival home, meal preparation, etc. during early evening hours. The blue lines, comparison of use with and without smart meters, shows that much of this energy use cannot be shifted.

Chart 2 – May 1 to October 31 – “Summer” Use – Load reduction will occur as a result of decreased air conditioning use.

Average July Load Profile for Residential Users – With and Without Smart Meters



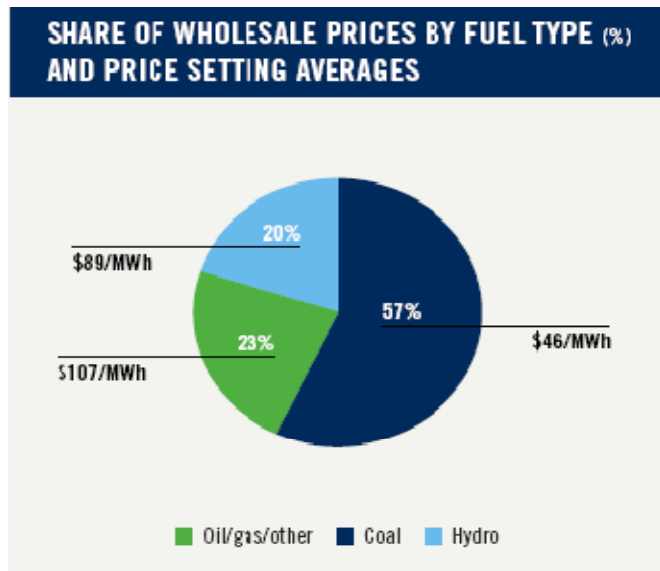
Results of the OEB's Smart Meter Pilot Project in 2006-2007 revealed no significant load shifting from On-Peak periods as a result of the Time of Use price structure alone. Minimal savings of an average of \$1.44/month were identified as a result of load shifting. Participants achieved far greater savings of \$2.73/month by simply reducing consumption of electricity.

These savings will likely not even offset the monthly smart meter fee. Managing summer and winter peak loads are two different challenges. Air-conditioning is the key focus in the summer and ratepayers have some ability to respond to demand. In the winter there is little opportunity to load shift and conservation is the target. The Smart Meter Program is a very expensive way to address these challenges and has marginal impact.

■ The cost of this program is approximately 50% more than the cost of refurbishing a nuclear reactor equivalent to the capacity of the “hoped for” demand reduction.

### 3.3 COST INCREASES RESULTING FROM COAL CLOSURE – 2010-2014

- Costly Ideology – Political move
- Coal - low cost supply – publicly owned, paid-for assets – mitigates the higher cost of other generating resources
- Impact on market price - The wholesale market price for electricity is based on supply and demand. Suppliers submit offers to sell electricity and wholesale buyers submit bids to buy electricity. The IESO then uses these offers and bids to match electricity supply with demand, and establishes the Hourly Ontario Energy Price, or HOEP - the price paid by wholesale customers. As demand increases, more expensive offers from generators are accepted, which raises the price of electricity. As demand drops, only the less expensive offers are accepted, which reduces the price.



(IESO 2005 Annual Year in Review)

With coal removed, natural gas-fired generation will set the market price 85% of the time at much higher cost.

For every 10% increase in natural gas prices, Ontario electricity spot market price rises 6%. Although gas prices are low at present, they are not expected to remain so.

Assuming a cost of \$7.50 to \$8.50/MMBtu for natural gas, the removal of coal power will result in an electricity price increase of \$6 to \$13/MWh. (Aegent Energy Advisors Inc.)

- Natural gas will be used to replace coal; to fill in for nuclear when units come out of service; to provide additional power to back up intermittent wind and solar
- Ratepayer Impact - By 2015 natural gas generators contingent support payments will = \$10,000/MW/month – total annual payment \$775 million. The Global Adjustment impact = \$5.34/MWh = 5.1% (Aegent Energy Advisors)
- The premature retirement of coal fired units will incur decommissioning costs payable by ratepayers.
- OPA has initiated purchase of “Black Start” for system reliability which coal units currently provide. This cost is part of the “wholesale market charges” (see page 13)

### 3.4 COST IMPACTS OF THE GREEN ENERGY ACT (GEA)

#### Higher Costs/Lost Jobs/Risk to Consumers

- The cost from the GEA will be between \$18 billion and \$46 billion from 2010 to 2025. (London Economics International LLC report “Examining the potential cost of the Ontario Green Energy Act, 2009”) The GEA will impact every component of electricity prices: Commodity costs, transmission, distribution, wholesale market charges (see page 13)
- Resource selection has traditionally been based on overall cost –assessment of the full lifecycle cost from construction to operation. Under the GEA, renewable resources – wind, solar, biofuels, etc. – are to be granted priority acquisition, including priority access to transmission, regardless of cost or cost effectiveness.
- The 20 year power plan proposed by the OPA designated 15,700 MW of renewable generation – approximately 8,000 MW of new resources. The government is now proposing 25,000 MW of renewable resources by 2025.
- There will be miles and miles of new transmission lines through all sorts of terrain to connect thousands of small scale generators and larger, remote supply to the provincial grid. Cost evaluations are presently discussed in the \$5 billion range. The costs will be borne – in a large measure – by power consumers through the local distribution company (LDC), and Hydro One.  
*“Hydro One was instructed by the Minister of Energy and Infrastructure to immediately commence work on 20 transmission projects, as well as other station work and distribution projects ... to accommodate output from renewable generation located in many of Ontario’s remote, yet resource-rich locations.”*

**New Generation Cost Responsibility Matrix**

Investment Type	Current Cost Responsibility	Proposed Cost Responsibility
Connection Assets	Generator (100%)	Generator (100%)
Expansions	Generator (100%)	LDC (up to a cap of \$90,000/MW) Generator thereafter OR LDC (100%) when investment contained in a Board approved plan or otherwise approved or mandated by the Board
Renewable Enabling Improvements	Generator (100%)	LDC (100%)

This chart demonstrates the costs that previously, and presently, are borne by the Generator (power producer) – those in the middle column - will soon be the responsibility of the Local Distribution Company (LDC) and passed on to the ratepayer

*The Board has issued an invitation to comment on the proposed amendments, noting that all interested parties are invited to comment in writing on the Proposed Amendments to the DSC by June 30, 2009.*

- With Hydro One already overburdened, private transmission developers will be contracted to provide whatever is needed at whatever cost is required.



## Proposed Feed-in Tariff Pricing

■ These are the rates that will be provided to developers of new renewable generation, per kWh. These prices will increase when the power is generated at peak times of the day. In addition, these rates will escalate on the basis of increases in the Consumer Price Index.

Proposed Feed-in Tariff Prices for Renewable Energy Projects in Ontario			
Base Date: July 8, 2008			
Renewable Fuel	Proposed size tranches	Proposed Contract Price \$/kWh	Escalation Percentage**
<b>Biomass<sup>2A</sup></b>			
	≤ 10 MW	13.8	20%
	> 10 MW	13.0	20%
<b>Biogas<sup>2A</sup></b>			
On-Farm	≤ 100 kW	19.5	20%
On-Farm	> 100 kW ≤ 250 kW	18.5	20%
	≤ 500 kW	16.0	20%
	> 500 kW ≤ 10 MW	14.7	20%
	> 10 MW	10.4	20%
<b>Waterpower<sup>2A</sup></b>			
	≤ 10 MW	13.1	20%
	> 10 MW	12.2	20%
<b>Landfill gas<sup>2A</sup></b>			
	≤ 10 MW	11.1	20%
	> 10 MW	10.3	20%
<b>Solar PV</b>			
Any type	≤ 10 kW	80.2	0%
Rooftop	> 10 ≤ 250 kW	71.3	0%
Rooftop	> 250 ≤ 500 kW	63.5	0%
Rooftop	> 500 kW	53.9	0%
Ground Mounted <sup>A</sup>	≤ 10 MW	44.3	0%
<b>Wind<sup>A</sup></b>			
Onshore	Any size	13.5	20%
Offshore	Any size	19.0	20%

### Appendix A: Maximum Aboriginal Price Adder and Maximum Community P Adder<sup>\*</sup>:

Renewable Fuel	Wind	PV (Ground Mounted)	Water	Biogas	Biomass	Landfill Gas
Maximum Aboriginal Price Adder (\$/kWh)	1.5	1.5	0.9	0.6	0.6	0.6
Maximum Community Price Adder (\$/kWh)	1.0	1.0	0.6	0.4	0.4	0.4

<sup>\*</sup> The percentage of the Maximum Aboriginal Price Adder or Maximum Community Price Adder added to Contract Price is based on the Aboriginal or Community Participation Level as defined in the FIT Rules.

Compare these guaranteed rates with existing costs for hydroelectric 3.6 cents/kwh; coal 4.8 cents/kwh; existing nuclear 5.5 - 6.5 cents/kwh

Escalation percentage means the percentage of the Contract Price that escalates on the basis of increases in CPI (Consumer Price Index), as set out in the price schedule

■ The costs, as shown on the above Chart, do not include costs associated with line losses, or for conventional backup generation (natural gas) to compensate for the intermittency of wind and solar power.

■ The GEA allows for **all** the costs associated with all aspects of the government's plans for the acquisition of renewable energy, conservation, the reduction of coal use, etc. to be fully recovered from ratepayers. This is – in effect – another tax without having any oversight by or approval of the Legislature. These costs will be high! These costs are totally at the discretion of the Minister of Energy, without any accountability.

■ The GEA allows the Energy Minister to make grants and loans to whomever in order to facilitate renewable energy.

■ The Act will not enhance economic activity. Studies (U.S., Germany, Spain) indicate that jobs created in the renewable energy sector are essentially administrative, clerical, “expensive and non-productive adding cost to consumers not benefit to the economy”.

A Spanish study suggests 2.2 jobs lost for each “green” job added (at extremely high cost). These studies conclude that the economies of these countries suffered as a result of much higher energy costs, and erosion of industrial base as a result. Spain's industrial rate has increased 100%, unemployment is at 18.7% and expected to rise above 20%.

■ The Smart Grid Forum estimates that \$1.6 billion could be spent to initiate the "smart grid" as planned in the Act. (\$2 billion has already been spent on the installation of smart meters.)  
Each \$1 billion adds \$0.48/MWh or .46%; total cost = \$3+ billion

■ Creation of a Renewable Energy Facilitation Office – **another** government energy agency

■ Creation of an “academic research chair” to examine potential public health effects of renewable energy projects

■ Municipalities and other government agencies - hospitals, schools, universities, etc. will be required to prepare energy efficiency plans and updates. Costs of these will be passed on to taxpayers.

■ Removal of safeguards for cost protection for Ontario consumers. The GEA changed the mandate of the Ontario Energy Board. As financial regulator, the Board had a responsibility to review power projects and transmission expansion to ensure cost effectiveness and economic prudence. Now, the Board is tasked with promoting renewal energy development and delivery regardless of cost.

■ Additional erosion of price protection includes:

- Decreased public assets – more for-profit private power generation

- Price setting will be via contract and tariff - removes competitive factor - public assumes some of risk that should fall to private generators (See impact of Provincial Benefit, below)

- Amending the Mandate of OEB so no agency accountable for protecting consumers re: price and reliability
- Inducements to encourage investment in green energy in Ontario at expense of ratepayers
- The government is making 20 year contracts for technologies that may well be obsolete or outdated in the near future. Renewable energy is expected to decrease in price and increase in technological advancement. We will be tied in to contracts for highly expensive, passé technologies with no financing available to pursue advancements.

■ For more information on the negative impacts of the Green Energy Act – and a response to the government’s claim of job creation – see our submissions to the Standing Committee on General Government and to the Environmental Bill of Rights Registry, available on our website – [www.caealliance.com](http://www.caealliance.com)

### **3.5 COST IMPACTS OF THE “PROVINCIAL BENEFIT”/GLOBAL ADJUSTMENT**

■ Price guarantees – whether by contract with the OPA, by regulation of OPG’s assets, or by the new “Feed in Tariffs” promised to new renewable generators – will impact the rising cost of power regardless of the market price. According to the OPA, Global Adjustment “payments are affected when new supply starts. For example: during the first quarter of 2009, St. Clair Power began production and payments for the new supply also started. With each new contract for conservation and supply, the cost of electricity and GA may increase.” (Cash Flows from the GA May, 2009)

■ When market prices are high merchant power generators benefit but consumers pay higher prices. When market prices are low merchant power generators are guaranteed a set income regardless of whether they generate much, little, or none. The ratepayer makes up the difference.

■ The Global Adjustment is also the mechanism for the OPA to recover costs of the Conservation/Demand Management programs and incentives – such as the “Great Refrigerator Roundup”, “PeakSaver” and the costs for commercial retrofits. Cost estimates suggest an additional 2.5% increase on consumer bills by 2008, and double that, or 5% by 2015. (Aegent Energy Advisors Inc.)

■ Power subsidies by way of contract and price guarantees result in Ontario ratepayers subsidizing exports of power and paying out when negative or low pricing occurs.

■ Most notably, the Provincial Benefit is an indicator of the failure of market delivery promises made to Ontario ratepayers. The consumer will be paying for 20 years for higher priced power without the benefits of risk removal.

■ Cost of electricity produced in 2009 was 6.22 ¢/kWh which includes the average weighted wholesale market price of 3.16 ¢/kWh and the average Global Adjustment of 3.06 ¢/kWh. In 2008, by comparison, the cost of electricity was 5.8 ¢/kWh, which represents a market price of 5.2 ¢/kWh and a Global Adjustment of 0.6 ¢/kWh.

## **3.6 HARMONIZED SALES TAX**

8% PST will be included in overall billing once the harmonized sales tax is introduced July, 2010.

## **3.7 OTHER**

■ Impact of a carbon tax on electricity rates – Carbon cap and trade provincially, federally, and in conjunction with the U.S. will impact the price of natural gas-fired generation as well as the production, refining and transport of natural gas. With so much natural gas power generation anticipated for the province, generation costs will rise.

■ \$480 million/year “take or pay” penalties to Bruce Power if transmission is not in place by the time the Bruce refurbishment is complete

■ Niagara tunnel project - over budget

As of August 8, 2009, the Niagara tunnel project is 3 years behind schedule and 60% over budget. (Original estimate \$185 million, now expected to cost \$1.6 Billion)

■ Bruce refurbishment – over budget – A portion of the cost overruns will fall to the Ontario ratepayers. “The Bruce refurbishment agreement is similar to the OPA’s new feed-in tariff (FIT) rates in that it was designed to produce a target ROE, was not competitively procured, indemnified the producer for transmission congestion, and contains significant escalators (much more rapid escalation than the new green power FIT). The ROE was calculated by CIBC World Markets to be in the range of 13.8% to 18%.” (return on investment)

■ Long term (20 year) contracts are being made for technologies that may become obsolete or less cost effective but we will have no money left for new and developing energy technologies.

■ Industrial electricity use decreased by 20% in the first quarter of 2009 as compared to 2008. Less industrial – large volume consumers – available to share the massive electricity costs means higher costs to all remaining ratepayers.

■ In addition to private contract costs impacting electricity rates, the IESO reports that “.. . *generator contracts are being structured to incent producers to react to market prices and curtail output during periods of oversupply.*” Also, “*On the demand side, further refinements will need to be considered to the Global Adjustment (which in part accounts for additional costs of contracted and regulated supply) to provide consumers with greater incentives to shift consumption to off-peak periods.*”

These contract modifications will further increase the “provincial benefit/global adjustment” factor.

## 4.0 IMPACTS OF HIGHER ELECTRICITY RATES

### **Industrial Concerns:**

The Government has refused to acknowledge and address industrial consumers regarding energy costs and issues

■ According to NOMA (Northern Ontario Municipal Association) *“high electricity costs, over the past several years have repeatedly been pointed out as a reason that paper mills, and saw mills in Northwestern Ontario can not compete. The result has been mill closures.”*

■ The OPA acknowledges that *“An increase in electricity prices may have adverse macroeconomic effects on the provincial economy in terms of employment losses and may hinder the effectiveness of Ontario businesses that compete outside of the province.”*

■ *“Today's increased globalization means that Ontario faces a more challenging and competitive environment than ever before. Ontario's future prosperity depends largely on its ability to continue to adapt, innovate and strengthen its competitive advantage. ... Reliable electricity supply and price stability, which keep Ontario's economy competitive and benefit all consumers, are central to the government's plan.”* (Ministry of Finance, “2006 Ontario Economic Outlook and Fiscal Review”)

■ In the past 4 years Ontario has lost 330,000 jobs in the manufacturing sector. That number is escalating. That number does not include the supporting service sector jobs. (For every \$1 in the manufacturing sector there is \$3.05 spin off in the economy.)

■ *“...delivered industrial electricity prices in Ontario have increased over 60% since 2001”* (Navigant Consulting, “Ontario Electricity Rates and Industrial Competitiveness”)

■ *“Ontario has experienced a serious erosion of its competitive price advantage in industrial electricity over the last 5 years, to the extent that in many cases ... it has become a price disadvantage.”* (Navigant, as above)

■ According to Weyerhaeuser, *“... since deregulation (there) is a 36% increase in power costs. ... our electrical bill is \$20 million per year, so it's a very significant input into our business. . . .”* (Standing Committee on Finance and Economic Affairs, 25 January 2006)

Ontario is a goods producing province. The government says that we will shift to a new economy – but what does that look like and where will the jobs come from?

■ Increased energy costs will cause further destruction to the economy resulting in increased job losses.

- Loss of Industrial Demand = less revenue – Costs are paid by fewer consumers resulting in higher costs for all
- Uncertain future regarding climate change policies and cost impacts of those policies is making industry nervous.
- The government is planning on 25,000 MW of renewable generation by 2025, primarily wind power. That will require a great deal more natural gas generation for back up than is currently feasible or doable on the existing and promised infrastructure. Much of the renewable generation is intermittent. Industry requires sustainable, reliable, uninterrupted power. Industry will look elsewhere if there is uncertainty regarding future electricity supply.

## **Agriculture**

- According to The Ontario Federation of Agriculture, “Without reasonably priced power the production and processing of food in Ontario would be uncompetitive and likely extinct. Agriculture is Ontario’s second largest industry. Reliable and reasonably priced power is essential to its sustainability.”

## **“MUSH” Sector:**

Costs for services, for education and health in Ontario will rise impacting the ratepayer and the taxpayer. For example, Ontario hospitals are the single largest provincial government expenditure. Hospitals have the highest energy intensity of all publicly funded facilities. A recent study of several large community hospitals identified electricity costs typically represent 23.7% of total plant operations and maintenance costs. The study notes that electricity prices have been protected under the province’s regulated rate protection plan will be subject to the potential for dramatic price increases for hospital electrical costs when they begin to pay market cost for power.

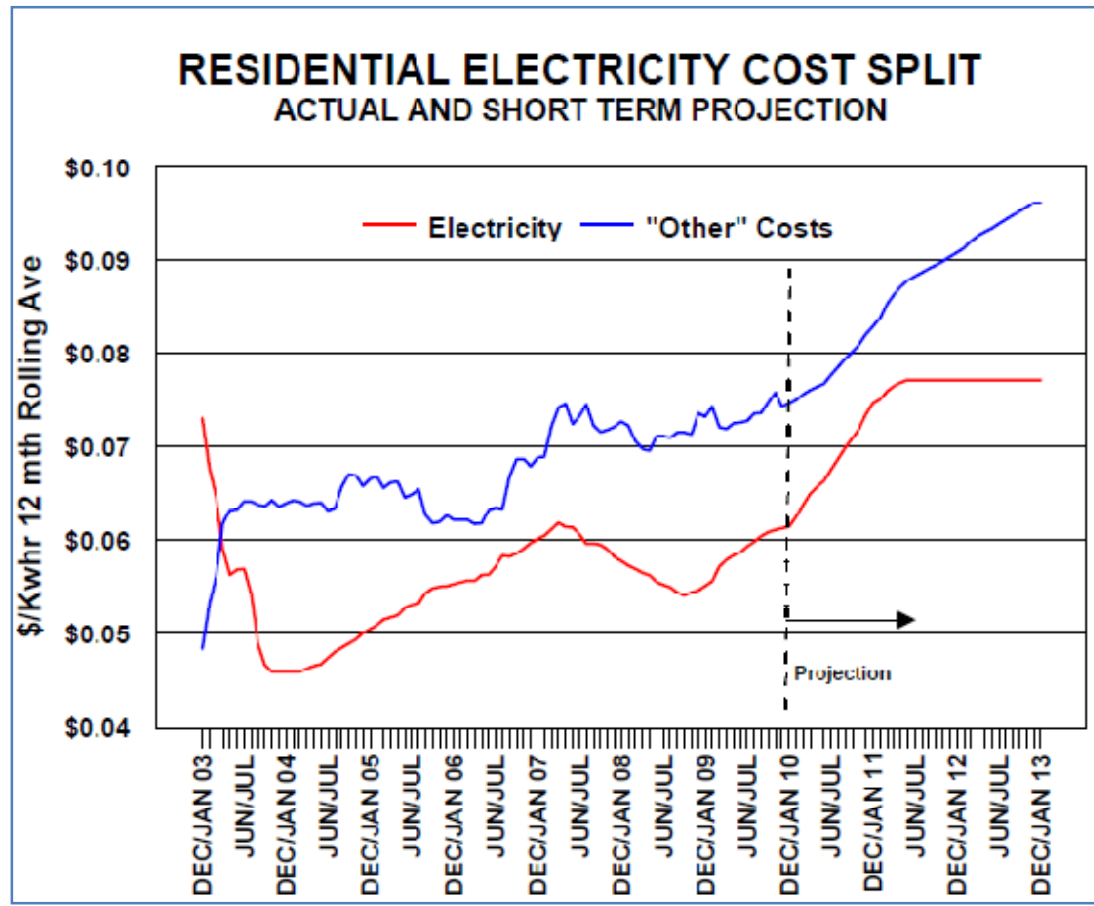
## **Small Business:**

The escalation of electricity costs for commercial and smaller business owners – increases of 35%-60% for the electricity use portion of their bill - will force many out of business.

## **Residential:**

Higher rates will be particularly painful for low income families and seniors on fixed incomes. With less disposable income, higher rates will become an intolerable burden.

## 5.0 WHERE WILL WE BE IN 2015-2020



This information is based on the actual electricity usage and costs of a retired couple, commencing Jan 2002 to date. To smooth out the volatility of month-to-month numbers, the data is presented as 12 month rolling averages. Average monthly consumption has been between 850 to 1100 Kw. The data is actual data through 8 full year cycles. Taxes are included in the pricing to understand the "full price" we pay.

The dip at the beginning of the chart was the reaction to the uproar over an attempt to introduce floating market rates. The usage rate was dropped to a fixed rate (4.3 c/Kw) and "other costs" were broken out into separate line items versus the previous two line item bill. The increase in 2004 was due to the introduction of tier pricing. The "bump" mid 06 to mid 08 was due to increasing tier rates (5.8 and 6.7 summer '06) and then a reduction (5.0, and 5.9 summer 2007). For more information see "Residential Electricity Costs – Actual and Projection" available on our website.

The information in this document has focused primarily on cost to the ratepayers of this province. We are, however, very concerned that reliable – as well as affordable – electricity will not be available by the middle of the next decade. Consider:

- The coal fired units are expected to be removed from service by 2014. These units provide intermediate generation to balance load – increasingly important as new intermittent resources are added. They can be utilized for baseload in the event of decreased nuclear capacity and can be quickly dispatched for peak load needs.

- Although there has been no firm decision regarding the refurbishment of Pickering B and the Darlington nuclear new build, OPG is prepared to conduct a “tune-up” of the Pickering units allowing them to remain serviceable to 2020. Existing Darlington units will undergo refurbishment beginning in 2016. The OPA advises that *“nuclear availability is lowest between 2016 and 2020 when a number of units are simultaneously on refurbishment outages.”* and *“... the period between about 2016 and 2021 will see a considerable reduction in the contribution from nuclear resources. For purposes of overall adequacy, it will be especially critical to manage and maximize nuclear availability during this period.”*

- There will be increased reliance on natural gas-fired generation. However, there are indications that there is insufficient infrastructure to supply natural gas for all the requirements of the planned and proposed new natural gas power plants.

- Although the recession and closure of manufacturing in Ontario has reduced power demand, it is hoped that this is temporary. What happens if/when demand rebounds?

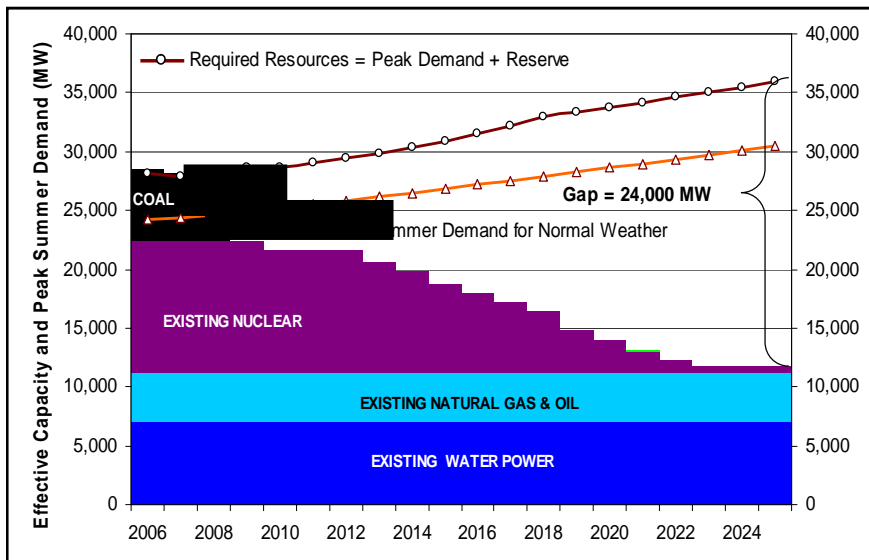
- The past 2 summers have been very moderate weather-wise. What happens if we return to 2005 style weather with less hydraulic power available and more air conditioning units operating?

- 2010 is the anticipated release date for the GM electric vehicle. What happens if the Premier’s expectation of 20% hybrid vehicles in the provincial auto mix by 2020 materializes?

The following charts demonstrate the reality of these concerns. Further information is contained in our companion document on the “Ontario Power Outlook”.



Compare the resources on the chart below – those that are decreasing in availability – to the production statistics in the chart on the right. The gaps in available resources represent critical non-intermittent baseload and intermediate load following and load balancing resources.



- Generation by Fuel Type 2008:**
- 53 % from Nuclear (84.4 TWh)
  - 24.1 % from Hydroelectric (38.3 TWh)
  - 14.5 % from Coal (23.2 TWh – lowest since 1996 – 18% less than the 28,1 TWh produced in 2007)
  - 6.9 % from Gas/Oil (11 TWh)
  - 0.9 % from Wind (1.4 TWh)
  - 0.6 % from Other Sources (1 TWh)

**Table 4.1 Existing Installed Generation Resources as of May 5, 2009**

Fuel Type	Total Capacity (MW)	Number of Stations	Change in Capacity (MW)	Change in Stations
Nuclear	11,426	5	0	0
Hydroelectric	7,835	69	12	0
Coal	6,434	4	0	0
Oil / Gas	7,582	25	923	1
Wind	704	6	0	0
Biomass / Landfill Gas	75	5	0	0
<b>Total</b>	<b>34,056</b>	<b>114</b>	<b>935</b>	<b>1</b>

Refurbished Bruce units will not be enough to replace this baseload capacity

Removed from service – affordable, reliable

Insufficient infrastructure – what is the future cost? Available supply?

What does 16,000 MW of new renewable energy look like? (Green Energy Act Coalition) What is the cost at 13.5-80.2 cents/kWh?

# **THE CLEAN, AFFORDABLE ENERGY ALLIANCE**

## **Who Are We?**

- Volunteer organization
- Concern for reliability and affordability of power
- Followed the evolving energy policy over the past 4-5 years
- Research energy and environmental information
- Input to Ontario Power Authority (OPA) process – Intervenor with Ontario Energy Board re: Integrated Power System Plan
- Participation in conferences and public forums
- Submissions and presentations – media; local, provincial and federal politicians; Ministries of Energy and the Environment; Legislative Committees
- Rely on statistics from informed, unbiased, and credible energy sources