



managing your
electricity costs

*a guide
for business*

Ontario's electricity market opened in 2002. Managed by the Independent Electricity System Operator, the market provides a fair and transparent means of pricing this essential commodity – with an hourly price that reflects the true cost of producing it.

Electricity acts like other commodities where the price is influenced by supply and demand. There is one key difference: since electricity can't be stored, hourly prices are much more volatile than other commodities. With changing hourly prices come more opportunities for businesses to control their electricity costs by targeting their consumption to lower-priced times of the day.

The IESO is responsible for managing and balancing the real-time supply and demand for electricity in Ontario. The IESO directs generators and companies that deliver electricity to operate their equipment to ensure that the electricity system as a whole functions in a stable and reliable manner.

The IESO aims to provide businesses with information about the electricity market to help them manage their bottom line. Visit us at www.ieso.ca/business



REDUCING ELECTRICITY COSTS BOOSTS YOUR BOTTOM LINE

More and more businesses across Ontario are recognizing that electricity costs aren't just an overhead – they're a drag on their bottom line.

By understanding how and when your facility uses electricity, you will be able to discover opportunities to cut costs and boost profits. You will also be able to tell your customers and community that your business is using electricity wisely.

FIVE KEYS TO MANAGING ELECTRICITY COSTS

1. Understand how you're billed

Businesses that use at least 250,000 kilowatt-hours of electricity per year (or at least \$2,000 per month in electricity costs) pay the market price for electricity rather than the flat-rate price that households, small businesses and designated large-volume customers pay.

As a business that pays the wholesale, competitive price for electricity, your costs are based on:

- how much you use;
- your peak demand or how quickly you draw electricity from the system; and
- the time of day and week you use it (if you have an interval meter).

With these variables, there are many opportunities to save on electricity costs. By managing peak demand and using your interval meter to take advantage of price fluctuations, you can lower your electricity costs.

2. Know where you stand today

The cost-savings opportunities will become clear by finding answers to these questions:

- What price are you paying – the hourly price, the monthly average market price, or a retailer contract price?
- How much are you using?
- What's the pattern of your usage – is it higher at certain times of the day or month?
- Do you draw heavily on the system for a short period of time once or twice a month to perform a specific operation?

3. Control your electricity use

Making changes to your operations or equipment can yield significant savings.

Take advantage of price fluctuations. Electricity prices change hourly in the open market, just like other commodities whose prices move in response to supply and demand. In fact, electricity prices are among the most volatile of any commodity. If you have an interval meter and understand the basic pricing patterns, you can schedule production to times when electricity prices are lower.

Manage your demand. Since certain charges are based on your peak demand – the fastest rate at which you "draw" electricity from the power system – you can control this charge. You can run pieces of equipment or complete production processes in series rather than all at once and significantly lower your demand charges.

Use less electricity. Shut off or reduce lighting at certain times of day or in certain areas of your facility, and ensure non-essential equipment is powered down. Invest in energy-efficient equipment and technology that reduce the overall amount of electricity you use.

4. Invest in an energy management plan

An energy management plan can boost your bottom line over the short and long-term. Understanding how you incur costs for electricity, how you use it, what changes you can make to your operations to become more energy efficient – and then putting the plan into action – can significantly reduce your costs.

5. Cash in on incentives

Provincial agencies and many electricity utilities offer financial incentives for businesses that take steps to conserve electricity or change the way they use electricity. These 'Conservation and Demand Management' (CDM) incentives can make energy efficiency a profitable exercise.

1

understand how you're billed



To reduce your electricity costs, the first step is to understand how you're charged for electricity.

- **Electricity/Commodity** - is the cost of the electricity measured in kilowatt-hours (kWh) supplied to you. It is the part of the bill that is subject to competition. This means you can buy it through your local utility or choose a retailer licensed by the Ontario Energy Board.
- **Line Loss** - When electricity is delivered along distribution lines, not all of it reaches its destination. For example, when electricity moves along the wires, some of it is lost as heat - it's simply a function of the physics of how electricity moves. Utilities use a "loss factor" to adjust the electricity consumption up so that you pay the full amount of what it costs to supply your electricity. This difference is typically shown on bills as metered usage and billed usage.
- **Standard Supply Service (SSS) Administration** - This \$0.25 charge per month covers the administrative costs to your utility if you don't have a retail contract.
- **Regulatory (Wholesale Market Services)** - This rate provides for the reliable management of the power system and the wholesale electricity market. It is 0.62¢/kWh and is approved by the Ontario Energy Board.
- **Debt Retirement** - This charge of 0.7¢/kWh is set by the Ontario Ministry of Finance to pay down the residual stranded debt of the former Ontario Hydro.
- **Ontario Power Generation (OPG) Rebate** - All businesses paying the wholesale price for electricity receive the OPG Rebate. This rebate is paid quarterly and appears on your electricity bill as a credit based on your total electricity consumption for the quarter. If your business purchases electricity from a retailer, you may or may not receive this rebate depending on the terms of the contract. This rebate will be in effect until April 30, 2009.

ENERGY CHARGES (kWh)

Basic Terms

Energy
Consumption/Use/Usage

Units

Kilowatt-hours (kWh)

Related Bill Items

- Electricity/Commodity Charges
- Line Loss Charges
- SSS Administration Charges
- Regulatory Charges (Wholesale Market Services Charges)
- Debt Retirement Charges

Adjustments

- OPG Rebate
- Provincial Benefit
- **Provincial Benefit** - The price of electricity in Ontario is set by a competitive market. However, to ensure that there is always an adequate supply of electricity, certain generators receive payments through regulation or contracts that differ from the market price. The Provincial Benefit, set at the beginning of each month, settles up differences between the market price and rates paid to regulated and contracted generators. The Provincial Benefit may be a credit or a charge, depending on whether the market price is lower or higher than the contract rates.

Although each utility in Ontario uses a slightly different bill format and terminology for its customers, two basic principles are common to all. Your electricity costs are based on:

- (i) **How much** electricity you consume, measured in kilowatt-hours (kWh), and
- (ii) **Peak demand** – this is how fast you draw electricity from the system, measured in either kilowatts (kW) or kilovolt-amperes (kVA).

DEMAND CHARGES (kW or kVA)

Basic Terms

Power
Demand (Peak or Maximum)

Units

Kilowatts (kW), Kilovolt-Amperes (kVA)

Related Bill Items

- Transmission Charges:
 - Transmission Connection Charges
 - Transmission Network Charges
- Distribution
 - Customer Service Charges

Adjustments

- Transformer Credit
- Power Factor

- **Transformer Credit** – Customers who own and maintain their own transformers that connect them to the power grid receive this credit. The rate is based on peak demand, and is typically set at \$0.60/kW.

- **Power Factor** – Power factor does not typically appear as a line item on your bill, however, if your facility has low power factor, this can result in higher distribution and transmission charges. Distribution and transmission charges are often billed on either the metered kW or 90% of the metered kVA, whichever is greater. Therefore low power factor (which is the ratio between the maximum kW and maximum kVA) results in extra charges. A number of industries have found that correcting power factor can provide one of the fastest paybacks when making investments to reduce electricity cost. Your local utility can tell you if you're paying a penalty for power factor.

- **Transmission*** – These regulated charges are required to cover the capital and operating costs of Ontario's high-voltage electricity grid. They include two components:
 - **Transmission Connection** – Your utility is connected to the transmission system and the electricity has to be transformed to lower voltages before your business can use it. This charge covers this cost.
 - **Transmission Network** – This covers the cost of operating and maintaining the towers, wires and other equipment used to deliver electricity from where it's generated to your local utility.
- **Distribution*** – This rate, regulated by the OEB, covers the cost of delivering electricity from the transmission system to your business. The charges go to your local distribution company to build and maintain the distribution lines, and poles.
- **Customer Service** – This fixed monthly charge covers your utility's administrative costs such as meter reading, billing and customer service.

Talk to your utility

If you have questions about how your bill is calculated or don't understand the cost breakdown, talk to your local distribution company. They can explain your demand and energy charges and confirm whether you're paying the competitive market price for electricity.

Note: your electricity bill may or may not reflect all the charges outlined here – sometimes charges may be bundled.

** Delivery is the term used when a utility bundles the distribution and transmission charges.*

2

know where you stand today



Understanding how much energy you use and when, and how fast you draw it from the system, can reveal the cost-savings opportunities.

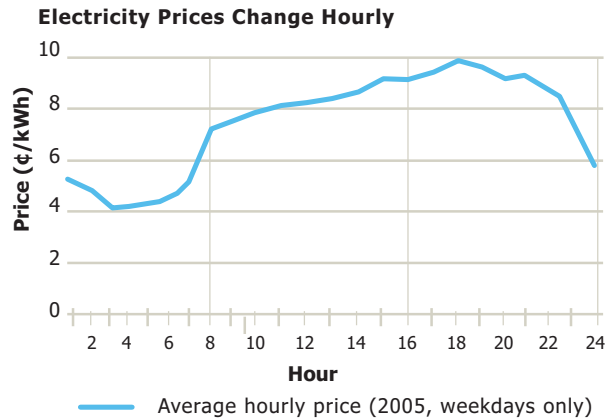
Interval meters track usage hourly

As a market rate customer, interval meters are the only way for you to take advantage of fluctuations in price. Interval meters allow you to track how much electricity you use on an hourly basis and your electricity costs for every hour of the day. Having an interval meter means your utility charges the Hourly Ontario Energy Price (HOEP) for electricity.

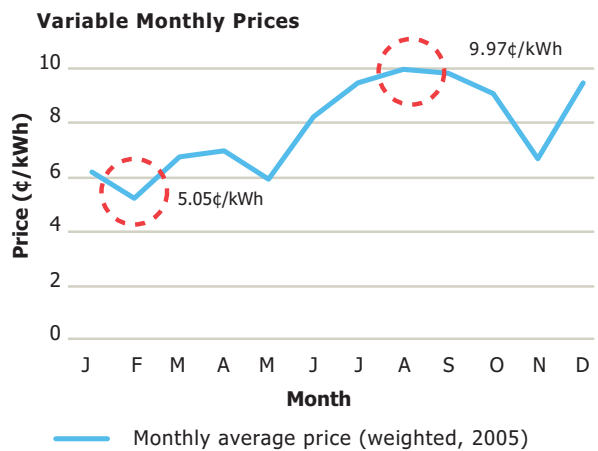
Businesses without interval meters pay a weighted average of the hourly price which is based on the consumption patterns of consumers in your area, rather than just your own.

If your electricity use is relatively consistent 24 hours a day, or if you use more electricity during off-peak hours, your costs will likely decrease with the installation of an interval meter. Your costs may rise, however, if you use more electricity during high-priced periods. Your local distribution company or an energy consultant can help you determine whether it may be advantageous to purchase one.

If you don't have an interval meter, or a smart meter, you will be required to have one soon. As part of an Ontario Government initiative, all electricity consumers will have one by 2010, with a significant number of installations beginning in 2007.



Customers who have interval meters and pay the Hourly Ontario Energy Price (HOEP), can track how much electricity they use each hour of the day and how much it costs.



Approximate 2005 prices for companies that paid the market rate but did not have interval meters.



“I would never advise investing a cent until you’ve taken care of all the low-cost energy savings opportunities first.”

Brian Laine, Plant Engineer, Baskin and Robbins, Peterborough, Ontario

Get the details on your demand

Demand profiles are like a fingerprint – they detail the characteristics of your company’s electricity use over time. They are an important tool to help you understand your company’s electricity use patterns and how to manage them more effectively.

You will see what times of day you’re using electricity, how much you’re using, and when your peak demand occurs each month. Understanding when your business sets a demand peak can help determine what equipment or process may need to be adjusted in order to lower demand charges. You can also determine whether there are ways to avoid using electricity at the most expensive times of the day. Your local utility or an energy consultant can provide you with data and information on your demand profile.

Energy audits reveal potential savings

Consider hiring a professional to help you understand how you’re using electricity, when you’re using it, and how much each piece of equipment draws (demand) and uses (consumption). The auditor can also provide you with suggestions on process changes and/or investments in energy-efficient technology. You will also be shown how much less electricity you will use with each change, and how soon investments will pay for themselves through savings on electricity costs.

How an energy audit paid off for Baskin and Robbins

The Baskin and Robbins facility in Peterborough has been undertaking energy savings projects for a number of years. “There is no question, the investments we’ve made in technology upgrades have paid off,” says Brian Laine, Plant Engineer. Lighting retrofits, and installing variable frequency drives on freezer motors, dairy pumps and tank agitators have saved tens of thousands of dollars annually. “Energy projects have helped our bottom line and have kept our plant competitive,” said Laine.

With 19 million litres of ice cream shipped to 30 countries every year, the plant’s 50 employees are committed to quality. “Our focus is making great ice cream - so we tend to overlook how our actions affect our electricity use.” But employees began to see things differently when an energy audit identified annual savings of more than \$25,000 with no up-front investment. The auditor pointed out how minor operational changes like reducing the condensing pressure, optimizing the frequency and length of defrosting cycles, shutting off evaporator fans and lighting when not needed, all led to significant cost savings with no impact on the final product. “We didn’t have to invest in new equipment - all it took was a change in our behaviour.”

3

control your electricity use



Making decisions on potential energy savings initiatives is easier when you understand daily and weekly pricing trends as well as the impact of rebates and adjustments.

Understanding how electricity prices vary can help you manage electricity costs. Simply put, if you have an interval meter, using less electricity at times when the price is high can cut costs dramatically.

What influences fluctuations in electricity prices? Electricity acts like any other commodity where price depends on supply and demand with one important difference. Because electricity can't be stored, prices are much more volatile hour-to-hour than other commodities.

When demand for electricity is high, more generation is needed. This often drives up the cost of power. Think about hot summer afternoons when chillers are running full tilt and industrial production is at its peak.

Supply is determined by how much generators can produce. Certain power sources are more expensive to run than others. These higher-cost generators only run when demand is high relative to supply.

If your business can't take advantage of price fluctuations or needs more certainty

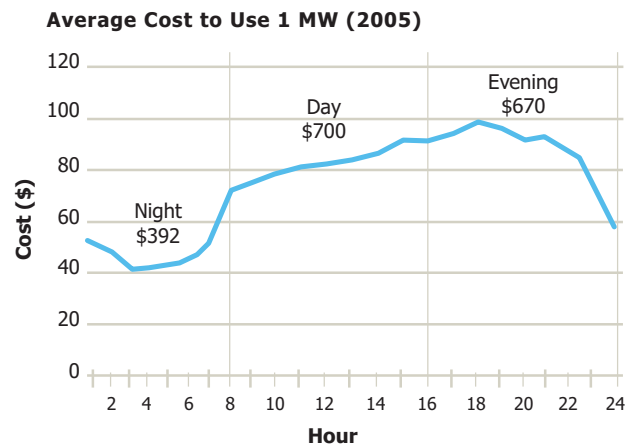
Consider a retail contract

As a large volume consumer, it might make sense to purchase electricity at a fixed rate through a licensed retailer. Fixed-rate contracts will not necessarily save money as, much like gas prices or interest rates, no one can predict what future prices will be. A retail contract can, however, provide your business with certainty about the electricity portion of your bill - regardless of how prices fluctuate. Conditions and prices do vary

and under some contracts, you may be required to sign away the Ontario Power Generation (OPG) rebate. For information on retail contracts see www.ieso.ca/retailers

Hourly price trends

For most of the year, electricity prices tend to be higher in the afternoon, particularly between 4:00 p.m. to 6:00 p.m. Prices are usually lowest on weekends and overnight, between 11 p.m. and 7 a.m.



This example compares the cost of consuming 1 MW during the day, evening and night.

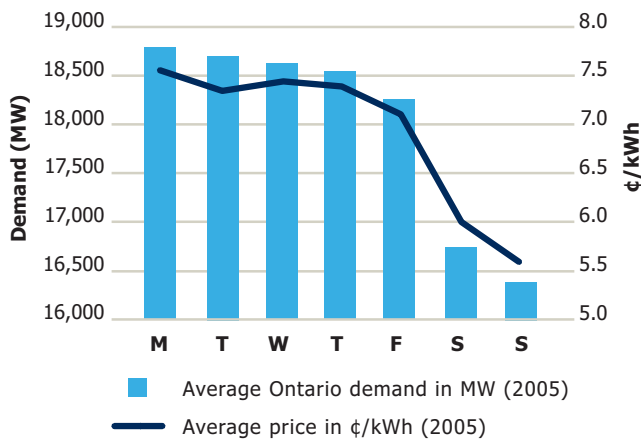
Cost savings opportunity: If you have an interval meter, shifting operations to cheaper times of the day, or testing back-up generation during high-priced times, will save money. Running operations overnight can cut energy costs by more than 30 per cent.

“In the two years since we began tracking our consumption data and prices, we’ve managed to shave more than \$8 million off our energy budget for a total savings of 18 per cent.”

Steve Hall, *Director of Corporate Energy, Region of Peel*

Daily price trends

Electricity consumption across the province tends to be highest on Mondays. As a result, prices also tend to be highest on Mondays. Consumption is lowest on the weekends, as is the price.



Understanding average weekday and weekend pricing trends will help you decide how to moderate consumption or structure operations to take advantage of lower average prices.

Cost savings opportunity: If you have an interval meter, consider whether your business can reschedule some of its operations to weekends, when prices are lower. You may also consider planning maintenance operations or outages early in the week.

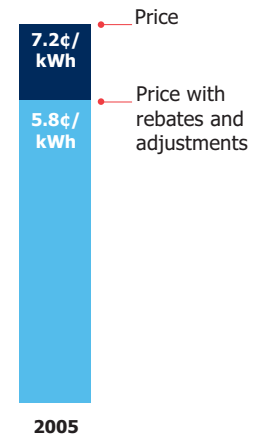
Rebates and Adjustments

While electricity prices are determined by the open market, you do have some protection from price volatility. Adjustments to your electricity costs reflect the difference between market prices and rates paid to regulated or contracted generators. Although hourly

and monthly prices can fluctuate, adjustments to the market price, as depicted in the adjacent graph, have helped to lower bills and mitigate those fluctuations.

Currently there are two adjustment programs in place:

1. **Ontario Power Generation (OPG) Rebate** – All businesses paying the wholesale price for electricity receive the OPG Rebate. This rebate is paid quarterly and appears on your electricity bill as a credit based on your total electricity consumption for the quarter. If your business purchases electricity from a retailer, you may or may not receive this rebate depending on the terms of the contract. This rebate will be in effect until April 30, 2009.
2. **Provincial Benefit** – This adjustment relates to the amount paid to certain contracted generators to produce electricity vs. the actual market price of electricity. If the market price for electricity is more than what generators were paid to produce it, the Provincial Benefit will appear as a credit on your monthly bill. If the market price was less than the amount paid to generators, the Provincial Benefit will appear as a charge. This is an ongoing monthly adjustment.



3

control your electricity use

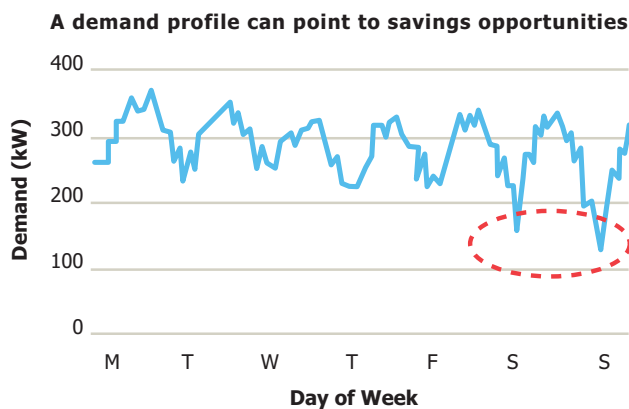


Make operational changes and save three ways: use electricity when prices are lower, reduce your peak demand, and use less electricity overall.

Conserve

You might be surprised to discover that making changes to use less electricity won't cost you much or anything at all, and can lead to considerable savings.

Regular equipment maintenance or turning off equipment not in use won't cost much but can shave five per cent off your electricity bill. For example, a grocery store in Burlington recently took a close look at how it used electricity. When they saw the store's usage pattern – or demand profile – the staff noticed that overnight electricity use dipped much lower on weekends. They realized that staff were turning off fewer lights during the week than on weekends. Changing the closing procedures on weekdays was easy and free, and the electricity savings added up.



More savings were obvious once the electricity use profile showed that fewer lights were being turned off on weekday nights than on weekends at this grocery store.

Consider self-generation

Generating your own electricity might be an option for your business. Thermal generators, wind turbines, solar power, biomass systems or small-scale hydroelectric can be used to replace what you consume from the power system during your business's demand peaks or when the price of electricity is high. It can be more economic to generate your own power during these times.

An added benefit is that you will always have back-up power in the event of power outages. You may also have the option of selling any surplus electricity back into the power grid. If you generate using renewable sources, you may be able to receive credits or even payments under the Ontario Power Authority's (OPA) Standard Offer program. Contact your local utility for more information on the technical requirements and approvals process.





“By ensuring that all my equipment wasn’t running at once, I was able to reduce my demand charges and see substantial savings on my electricity bill.”

Tenzin Gyaltsan, *Owner of Newcastle IGA*



Manage your peak demand

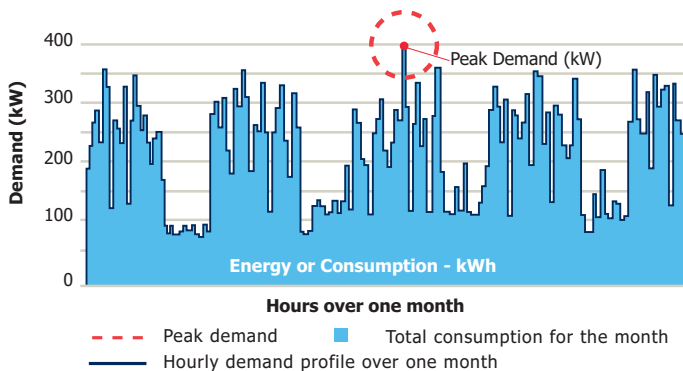
You can use the same amount of energy overall and still reduce your electricity bill. How? All you need to do is manage your business’s electricity demand and draw the same amount of electricity from the system at a slower rate.

Demand charges cover the cost of the size and type of wires and equipment needed to get the electricity to your business. Drawing a lot of electricity at one time creates a higher demand. Higher demand requires additional wires and transformers that can supply electricity at the rate you draw it without overloading. So, the higher your monthly peak demand, the higher your bill.

Many utilities across Ontario have programs that reward businesses for reducing the demand on the system. Contact your local utility for more information.

Remember, your electricity delivery charges for the month are typically based on one 15-minute or 60-minute peak. If you can reduce your peak, you will also reduce your delivery charges.

Your peak demand determines your monthly delivery charges



“As the Newcastle IGA owner, I’m also the energy manager. You need to stay educated to keep on top of ways to save money. Every penny adds up,” says Tenzin Gyaltsan, Owner of Newcastle IGA. “I’ve had an energy audit done in the store and I attended a seminar for grocers that explained my electricity bill and the demand charges, both of which helped me better understand what to do,” he added.

Gyaltsan uses a computer automation system that turns lights off and sets the compressors and defrost cycles in his refrigeration equipment on timers to ensure they are not all coming on at the same time. By reducing how many pieces of equipment are running at once, Gyaltsan can reduce how fast his store draws electricity, which lowers the demand charges on his store’s bill. “It’s not easy. I have to look at the store and all the equipment as a whole system and optimize my energy use,” says Gyaltsan.

“I’ve managed to significantly reduce electricity use in my store – it’s something I’m always working on and I watch my bill to see how my actions are having an impact.”

4

invest in an energy management plan



Energy use should be a key part of your business's strategic plan.

Understanding your business's technical systems and how your staff operate them are the key to identifying opportunities to use electricity wisely and reducing your electricity costs. Outlining this information in an official plan helps you ensure your staff understand what changes need to be made and why, and also helps you track your progress, cost-savings, and payback on investments in energy efficiency over time.

The following eight steps provide a simple, systematic approach to understanding how your business uses electricity, what influences costs, how you can use less, and how to chart your success.

Step 1: Understand your Energy Costs

Understanding which factors influence your demand (kW or kVA) and energy (kWh) costs are important aspects in understanding what steps you need to take to reduce those costs.

Step 2: Monitor and Target

Comparing monthly data can help you determine how energy consumption at your facility varies over time. For example, comparing energy against production can help you determine energy costs per unit of production as a means of assessing potential savings opportunities.

Step 3: Understand When Energy is Used

The cost of electricity is influenced by when it's consumed. Your company's demand profile shows your energy use patterns - information which is useful if you're considering changes to lower demand or if you have an

interval meter, you can take advantage of times of day or month when electricity prices are lower.

Step 4: Understand Where Energy is Used

Identify your energy hogs – the equipment that draws the most power to run. If you make changes to this equipment, you will see a bigger reduction in your electricity costs. An energy audit provides a useful, detailed breakdown of how much gets consumed in your facility and where.

Step 5: Eliminate Waste

Energy waste can appear in many forms including excess time, volume, pressure and temperature. In order to realize energy savings opportunities, it's important to match what your business actually uses to what's really needed. Once these requirements are established, eliminating waste becomes an effective cost-savings tool.

Step 6: Maximize Efficiency

The condition of your company's equipment and operating conditions can have a significant impact on energy-savings potential. Changing the way you operate or maintain existing equipment, or investing in more energy-efficient technology, can yield significant savings. While some operational changes can have relatively little or no implementation costs, investments in equipment upgrades or retrofits may have a shorter payback period than you'd think and can lead to permanent long-term savings.



“Electricity savings projects over the last three to four years have saved our company over \$1.2 million.”

Scott Wilkens, Plant Power Systems Owner,
Procter and Gamble, Belleville, Ontario.

Step 7: Optimize the Energy Supply

Once you've reduced your requirement for energy, you may consider higher cost alternatives to meet your growing energy needs. You may wish to investigate heat recovery, cogeneration and renewable generation options.

Step 8: Monitor your progress, share the results

Charting your progress over time helps you share these successes with staff and encourage them to keep looking for ways to lower electricity costs. You will have a rolling operational schedule and maintenance plan that takes advantage of opportunities to reduce electricity costs. And you will see how investments in energy efficiency pay off.

Ready to make an investment in energy-efficiency?

For a fee, an energy efficiency professional can help find new ways to use less electricity in your operations and save money month after month. You will also get advice on planning upgrades and retrofits to get the most out of your investment. Contact Natural Resources Canada's (NRCan) Office of Energy Efficiency (OEE) for information on financial incentives to help plan and implement your energy upgrades:

www.oee.nrcan.gc.ca/buildings

How an energy management plan led to big dividends at P&G

For close to 20 years, Procter and Gamble (P&G) Inc. has been hard at work identifying energy efficiency opportunities. But it wasn't until its Belleville facility expanded five years ago that the company began tracking its progress in reducing energy costs. "The practice of energy conservation has always been an integral part of our business and approach," said Scott Wilkens, Plant Power Systems Owner at the P&G Belleville facility. "We recognize the importance of energy conservation to both P&G's bottom line and the environment, and have taken a pro-active approach over the years to building energy efficiency programs that address both."

Tracking their hourly energy readings is key to understanding the effects of demand and price on P&G's monthly electricity consumption patterns. These hourly readings allow P&G to create its own consumption profile and monthly baseline. "Tracking demand and price information is extremely important when you're building energy savings projects", said Wilkens. "We save \$158,000 annually on eliminating pre-filter fans, \$50,000 from using water chiller automation and \$58,000 in shutting off lighting in over-lit areas." These steps have clearly paid off. P&G has reduced its electricity use by 26 per cent over the past three years.

5

cash in on incentives



Taking advantage of incentive programs can directly impact your bottom line.

EMERGENCY LOAD REDUCTION PROGRAM

The IESO has developed a program to keep the power system functioning reliably during times when the electricity system is under heavy strain. The Emergency Load Reduction Program (ELRP) provides financial incentives to businesses that reduce electricity or use back-up generation when the electricity supply-demand situation is tight. Not only will you avoid using electricity when prices are high, but you will get paid to do it. Participating companies also have the opportunity to tell customers that they are doing their part to help keep the power flowing in Ontario. See www.ieso.ca/ELRP for more information.

CONSERVATION AND DEMAND MANAGEMENT

Local Programs by Utilities

Utilities across Ontario are launching Conservation and Demand Management (CDM) programs designed to help businesses adopt energy efficient technologies. Talk to your local utility about the complete range of strategic conservation and load management incentives. Contact information for all utilities in Ontario is available at www.ieso.ca/findyourutility.

Provincial Programs by OPA

The Ontario Power Authority's (OPA) Demand Response Program provides businesses with incentives to reduce their peak demand on the electricity system. Businesses that stop drawing electricity or reduce their electricity demand at peak times, or who invest in their own electricity generation facilities can receive financial incentives. Visit: www.conservationbureau.on.ca for more information on this and other conservation and energy-efficiency programs administered by the OPA.

Natural Resources Canada

Natural Resources Canada's Office of Energy Efficiency (OEE) offers a wide range of programs and services to improve energy conservation and energy efficiency in every sector. The OEE offers financial incentives and other resources, including workshops, data interpretation and numerous publications to help Canadians save energy. For more information visit: www.oee.nrcan.gc.ca/buildings, or for a list of publications, visit: www.oee.nrcan.gc.ca/publications

For information on:

Your local utility – www.ieso.ca/findyourutility

Electricity price information for businesses – www.ieso.ca/business

Retail electricity contracts – www.ieso.ca/retailers

Joining the IESO's Emergency Load Reduction Program – www.ieso.ca/ELRP

Conservation programs available province wide – www.conservationbureau.on.ca

Federal government Office of Energy Efficiency – www.oee.nrcan.gc.ca



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