

MAKING THE SPOT PRICE OF ELECTRICITY WORK FOR YOU

A Guide for Business

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Independent Electricity Market Operator

Ontario's Wholesale Electricity Market
Year in Review, May 2003 – April 2004



AT THE HEART OF ONTARIO'S POWER SYSTEM

The Independent Electricity Market Operator (IMO) balances the supply of and demand for electricity in Ontario and directs its flow across the province's transmission lines. It manages the power system to meet the highest expected demand with extra power in reserve.

The IMO also runs the wholesale market, connecting all participants – generators that produce electricity, transmitters that send it across the province, retailers that buy and sell it, industries that use it in large quantities and local distribution companies that deliver it to homes and businesses.

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Michael Marx
Senior Operations Officer
IMO Control Room

COVER: Steam Whistle Brewery is a wholesale electricity customer that closely manages its energy use. As one of the first facilities to use Toronto's lake water cooling system, Steam Whistle's chilling requirements are met using a fraction of the energy consumed by traditional cooling technologies.

This review provides an overview of activity in Ontario's electricity market in its second year of operation (May 1, 2003 to April 30, 2004.) Additional copies of this report can be ordered by contacting the IMO at 1-888-448-7777. It can also be downloaded from our Web site at www.theIMO.com/business

GETTING MORE FOR YOUR ENERGY DOLLAR

It's important that customers be aware of the factors that affect the price of electricity in order to manage energy consumption efficiently and cost-effectively.

This Market Year in Review looks at the past 12 months and is meant as a tool to help businesses that pay the wholesale price better control their electricity costs. As you will see, *when* electricity is consumed is just as important as *how much* is consumed.

Shifting your electricity use to lower-demand times of the day pays off. The price of electricity is generally lower on weekends and at night when demand is also lower. On a weekday, the price of electricity usually peaks in the early evening as people arrive home from work. If we can both lower and shift our energy use, we can reduce the need for new generation facilities just to meet peaks in demand.

At the time this review is being published, the entire industry is involved in significant change. The Ontario government has launched a new vision for Ontario's electricity sector which includes changing residential and small-business price structures, securing additional energy resources, and evolving the wholesale market to offer more price stability. The IMO continues to work with all partners in the industry to ensure a reliable and efficient electricity system in Ontario.

This review is designed to be a guide to the IMO wholesale market and support your broader energy management efforts. The IMO web site provides up-to-date market information, which you can consult on a regular basis. More information is also available from a wealth of sources, which are listed on the back cover of this review.



The IMO Control Centre is the hub of system and market operations of Ontario's power grid. Here, operators direct the flow of electricity across the province ensuring that there is enough power to meet demand.

WHO PAYS WHAT PRICE

The rate you pay for electricity depends on how much you consume.

Low Volume Consumers: Homeowners, Small Business and Designated Consumers

Homeowners and small businesses pay a two-tiered rate for electricity. These customers pay 4.7¢/kWh for the first 750 kWh consumed in a month, and 5.5¢/kWh for each subsequent kilowatt-hour. This interim pricing plan, introduced on April 1, 2004, will remain in place until the Ontario Energy Board introduces a new pricing structure, expected by May 2005.

Specially designated large-volume consumers such as schools, universities, hospitals, farms and specified charities also pay the same fixed rates.

Large Volume Consumers: Medium and Large Businesses

Companies that use more than 250,000 kWh a year pay the wholesale price of electricity. These are companies that typically spend more than \$2000 a month on electricity.



Wholesale customers have three different options in purchasing electricity:

1. **Hourly Ontario Energy Price.** If your company has an interval meter that can track how much energy is used and when it's used, you will pay the hourly price for each kWh.
2. **Your Utility's Average Price.** If you don't have an interval meter, you will pay a weighted price based on the combined consumption patterns of all your utility's customers that don't have interval meters.
3. **Contract Price.** You may choose to purchase electricity through a retailer who offers fixed rates.

Market Participants

Some large-volume consumers choose to become participants in the market. These consumers also pay the wholesale rate of electricity, but they can also receive payments by offering to cut consumption and reduce overall demand.



SUPPLY AND DEMAND

Ontario needs enough generation capacity to meet the highest demand as well as required reserves.



2003 Blackout

The August 2003 blackout resulted from rapidly cascading outages that began in Ohio as a result of a number of deficiencies in specific practices, equipment and human decisions. Since its inception, the IMO has advocated mandatory and enforceable reliability standards, already in place in Ontario, across the whole North American power system.

The blackout demonstrated the importance of balancing supply and demand in order to preserve the power grid. While power was restored to most consumers within 30 hours of the initial blackout, generators that had shut down for safety reasons needed time to ramp up production. For the following week, consumers were asked to curtail their energy use so that demand wouldn't exceed supply. As a result, electricity consumption was roughly 20 per cent less than it would normally have been.

Throughout 2003-2004, demand was slightly lower than the previous year, when demand records were set in virtually every month. Total electricity demand for the year declined slightly to 151.47 TWh, a decrease primarily due to cooler summer weather.

Ontario's generation capacity improved significantly with the return to service of Bruce Power's Units 3 and 4 and Unit 4 at Ontario Power Generation's Pickering A station.

As a result, our reliance on imports to make up for shortfalls between the highest levels in demand and available domestic supplies was reduced.

While the demand/supply mix was favourable in the 2003-2004 market year, Ontario will require significant new generation capacity in the latter half of the decade.

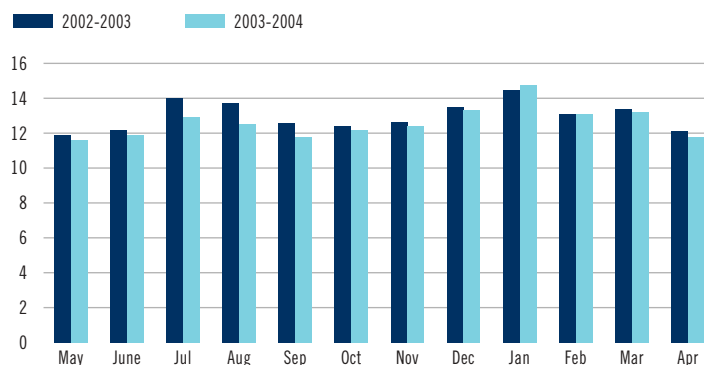


The IMO Web site offers up-to-the-minute demand and price information.

Ontario Electricity Demand

(in Terawatt hours)

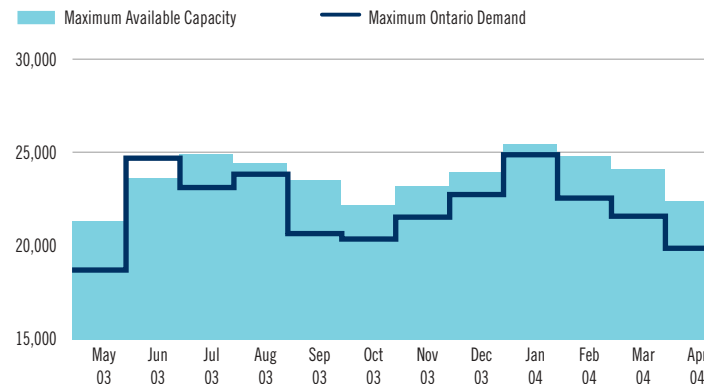
Overall electricity use was lower throughout the market year, except during an extreme cold snap in January.



Ontario Demand vs. Available Generation

(in Megawatts)

Ontario's resource adequacy improved with the addition of new generation capacity.



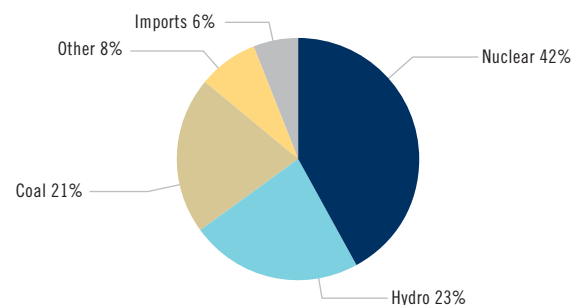
Know Your Energy Fuel Types

Electricity in Ontario comes from a variety of sources. Each fuel type fulfills a different role in meeting our power needs and each comes with different costs to produce.

- Nuclear-generated power is typically produced 24 hours a day, seven days a week. It provides “baseload” generation, and generally has low variable production costs.
- Hydroelectric facilities can provide either baseload or peak generation, depending on the availability of water to run the turbines.
- Coal plants tend to start up in the morning providing electricity until late in the day. The provincial government has made a commitment to phase out all coal facilities in Ontario due to environmental concerns.
- Natural gas and oil plants can also provide electricity throughout the daytime, but tend to generate only during peak hours because their cost to produce is higher.
- Ontario also imports electricity from neighbouring jurisdictions – either when the price of imports is competitive or when added supplies are needed to meet peaks in demand.

Energy Supply by Fuel Type

May 2003 – April 2004



Demand Response

In the IMO’s wholesale market, consumers of electricity with interval meters have the ability to “respond” to changes in the market. If, for example, demand is high and the price rises, you may choose to cut back on consumption to save money. This is known as Demand Response.

Demand response also helps alleviate the need to expand generation capacity. At any one time, Ontario needs enough generation capacity to meet the highest levels of demand plus reserve power. Demand response helps flatten these peaks.

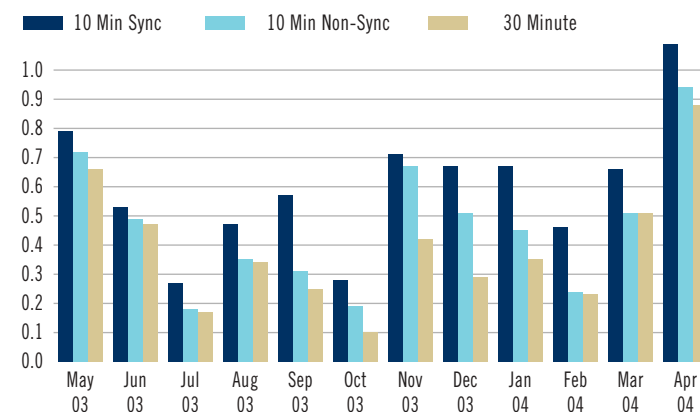
The wholesale market offers a number of opportunities for large-volume users or large groups of energy consumers to cut or shift their electricity use to off-peak periods. Some consumers can receive operating reserve payments to be on call to cut consumption if the IMO needs reserves to meet unexpected increases in demand or shortfalls in supply.

Later in 2004, the IMO is launching the Transitional Demand Response Program that will help businesses adopt more advanced energy management practices. Here, program participants will offer to cut back on energy use if the price is expected to reach certain levels.

Operating Reserve Payments

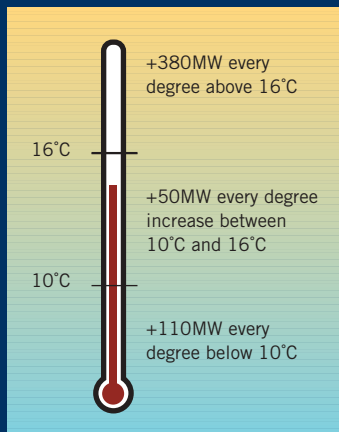
(in cents/kWh)

Some users may choose to offer “reserve power” to the market, receiving payments for being on call to cut consumption.



SUPPLY AND DEMAND FORECASTS

Short-term forecasts have improved, but potential for shortfalls exist in the long-term.



The Impact of Weather on Demand

Weather conditions affect the demand for electricity considerably. Extreme cold spells and heat waves often create surges in demand as people increase heating and air conditioning use. For example, each degree above 16°C creates an additional 380 MW of demand, enough to power a city the size of Brampton. And that's not counting the impact of humidity, which can also have a significant impact on demand.

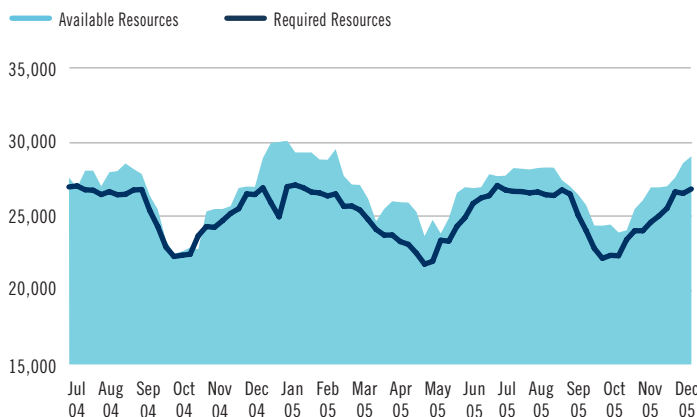
On extremely hot or cold days, it may be valuable to check the price and demand information on the IMO Web site to determine whether it would be more cost-effective to reduce consumption.

The supply outlook for the next 18-months is positive, as Ontario's electricity supply has improved significantly heading into Summer 2004. If normal weather conditions prevail, demand for electricity is not forecast to reach record levels. This could change if extreme weather conditions affect the province. The chart below shows IMO peak predictions for 2004 and 2005 under both scenarios.

Season	Normal Weather Peak (MW)	Extreme Weather Peak (MW)
Summer 2004	23,558	26,238
Winter 2005	23,734	25,501
Summer 2005	23,828	26,649

18-Month Outlook: Available Generation Resources vs. Required Resources (in Megawatts)

Many large-volume users schedule maintenance or plant outages in weeks when supplies are limited and prices are likely to be higher. This may still be prudent practice even though the availability of generation resources will be much improved for the next 18 months.

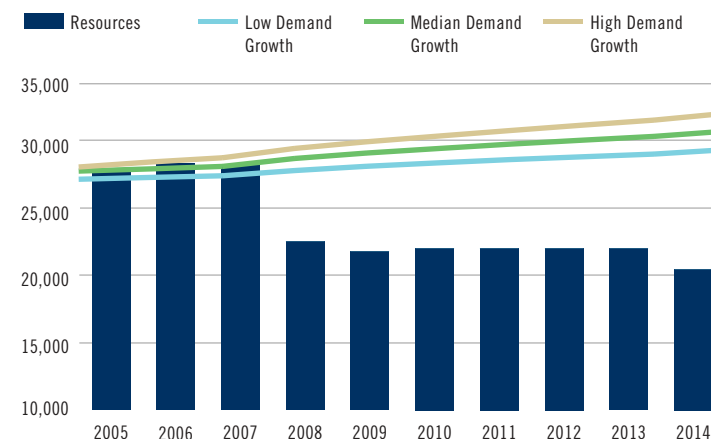


10-Year Outlook

Over the long-term, however, Ontario faces severe potential shortfalls in supply. Demand within the province is expected to increase by approximately one per cent each year for the next decade. By 2014, up to 13,000 MW of Ontario's electricity requirements will need to be met with new supply, refurbished generation or conservation measures. The Ontario government has recently announced new initiatives to address long-term system adequacy, including two Requests for Proposals to add new capacity through generation or by reducing demand.

10-Year Outlook: New Resources Required to Meet Peak Demand (in Megawatts)

Current available supplies, which will be significantly reduced with the phase-out of coal generation, will not be enough to meet future demand.



WHOLESALE PRICES

Wholesale electricity prices were lower in the past 12 months.

MONTHLY AVERAGE WHOLESALE PRICES (Weighted*)

May	2003	4.51¢/kWh
June		4.53¢/kWh
July		4.27¢/kWh
August		5.15¢/kWh
September		5.05¢/kWh
October		5.90¢/kWh
November		4.19¢/kWh
December		4.68¢/kWh
January	2004	6.95¢/kWh
February		5.43¢/kWh
March		5.02¢/kWh
April		4.73¢/kWh

*Weighted based on Ontario Demand.

From May 1, 2003 to April 30, 2004, the wholesale price of electricity averaged 5.07¢/kWh, a 19 per cent decrease over the previous year's price. This lower overall cost is a reflection of slightly lower demand and a higher level of available generation capacity.

Not only was the overall cost of electricity lower, it was also more stable. Excluding January, when demand reached an all-time winter record, the average monthly price never climbed above 6¢/kWh or fell below 4¢/kWh.

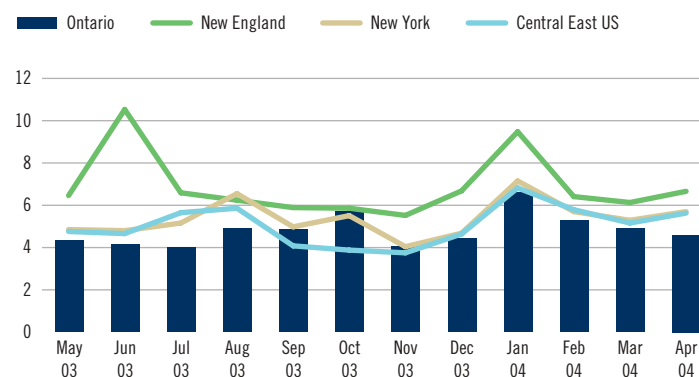
Understanding Market Prices

In Ontario's wholesale electricity market, the price of electricity rises and falls based on a variety of factors – such as demand, the weather and the types of generation available.

Ontario Wholesale Prices vs. Neighbouring Jurisdictions

(in cents/kWh)

In general, Ontario wholesale electricity prices are lower than in neighbouring jurisdictions.



For example:

- Prices are generally lower on weekends and at night. On a weekday, the price of electricity usually peaks in the early evening as people arrive home from work and begin using more electricity.
- Weather can have a tremendous impact on demand. Extreme cold spells and heat waves often create surges in demand as people increase heating and air conditioning use.
- The amount of electricity that is available in the market also influences the price. Some generation may not be available because of equipment maintenance.
- Price also depends on what types of generation are available – some cost more to operate than others.

Brief fluctuations in the price are unlikely to have a significant impact on your overall energy bill. It is, however, important to know when higher electricity prices are sustained over a number of hours. The Demand and Price page on the IMO Web site shows when prices are unusually high over a period of time.

Business Protection Plan Rebate

Customers who pay the wholesale price for electricity are eligible for a rebate under the Business Protection Plan Rebate. It's roughly half the difference between the market price and 3.8¢/kWh.

Your local utility calculates your rebate and incorporates it on your bill. If you purchase electricity through a retailer, check with your retailer to determine whether you are eligible for the rebate. The calculation of the rebate begins at the start of the market year – May 1. Rebates are then issued at the end of each quarter.

THE BOTTOM LINE

Wholesale Electricity Charges on Your Bill

The commodity charge is just one item on your electricity bill. Here are the average weighted electricity charges for the 2003-2004 market year.



Line Losses

The laws of physics dictate that as energy travels along a line, it creates heat and small losses occur. Line loss charges make up for the difference between the amount of electricity sent into the grid by the generator and the amount that arrives at homes and businesses. While in many industries the losses are usually incorporated into the overall cost of the product, electricity losses are itemized on the bill. There are two types of line loss charges:

Transmission Losses

Losses along the power grid are included in the Wholesale Market Services Charge.

Distribution Losses

Electricity is also lost as it travels along distribution lines to consumers. These losses will vary by utility and are applied as a multiplier against overall use.

Yearly Average Commodity Charge		5.07¢/kWh
Less Business Protection Plan Rebate	–	0.63¢/kWh
Average Commodity Price Incorporating Rebate	=	4.44¢/kWh
Wholesale Market Services Charge	+	0.62¢/kWh

This charge covers the cost of services required to operate the electricity system and run the wholesale market, and is currently a set rate determined by the Ontario Energy Board. These costs include:

- Physical Limitations and Losses
- IMO Administration Service
- Operating Reserve
- Rural or Remote Electricity Rate Protection

Interval Meters

Interval meters track how much electricity you use and when you use it. Ontario Energy Board regulations require that all consumers that have an average monthly peak of one megawatt of electricity over the space of a calendar year must have an interval meter. Mid-sized commercial and small-sized industrial facilities typically fit this profile. New customers that expect to have an annual average peak of 500 kW or more also need to install an interval meter.

Even if you don't fit this profile, interval meters can help you better manage your energy costs because they allow you to pay the actual hourly price for each kilowatt you consume. Without an interval meter, you will pay a wholesale rate based on the overall consumption

Transmission Services Charge **Varies**

This charge covers the cost incurred by transmission companies to construct, maintain, and operate the high-voltage transmission lines. Some utilities show this charge as part of the Wholesale Market Services Charge. This fee is also determined by the Ontario Energy Board, and varies by utility.

Debt Retirement Charge **+ 0.7¢/kWh**

This is a charge to pay down old Ontario Hydro debt and is collected on behalf of the Ontario government.

Other Charges **Vary**

Electricity consumers also pay two other charges unrelated to the wholesale market – the customer/distribution charge levied by their local utility and the federal Goods and Services Tax. The distribution charge includes a customer service charge to cover administrative costs and a distribution rate to cover the cost of delivering electricity to its customers.



patterns of all non-interval metered customers in your utility's service area. If your company uses more electricity at lower-priced times of the day, you may be paying more for your energy than you need to. Your local utility can provide more information about interval meters and whether they are beneficial for your organization.

ELECTRICITY CALENDAR

Electricity use varies throughout the day and throughout the year. Knowing when these changes take place will help you anticipate when prices could be higher or lower. Here is an overview of demand and price information for each season. You can compare your energy consumption patterns against this information to help determine what benefits you could gain from changing the way you use electricity.



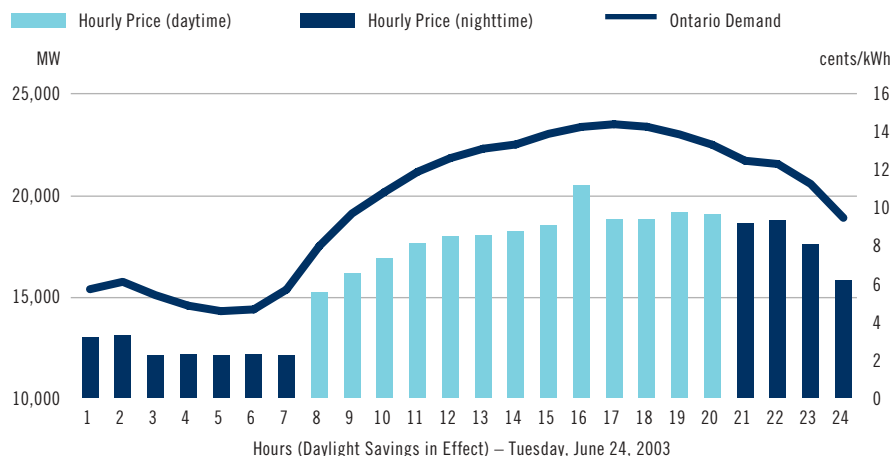
Summer (June/July/August 2003)

Ontario's highest demand peaks typically occur in the summer, as air conditioning can strain the system when the weather gets hot and humid. Summer 2003, however, was milder than the previous year. As a result, lower demand levels and good generation availability resulted in the lowest seasonal average prices of the market year.

Despite the lower prices, the difference between the prices during the day and night was greatest at this time of the year, increasing the benefit of shifting or cutting consumption. On a typical summer day, demand can start off quite low, but steadily builds as the day gets hotter until the supper hour when people arrive home and turn appliances on.

*Generator availability was significantly reduced between Aug 14-22. The market was also suspended during the power emergency and administered prices, based on past pricing patterns, were applied.

Summer 2003 Peak	24,753 MW
Record Peak (August 13, 2002)	25,414 MW
Average Price	4.65 ¢/kWh
Average daytime price	6.42 ¢/kWh
Average nighttime price	3.37 ¢/kWh

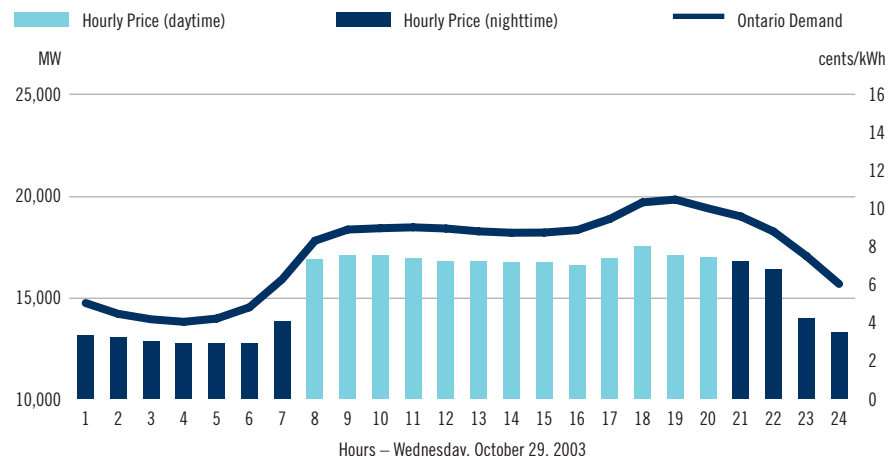


Fall (Sept/Oct/Nov 2003)

As the weather cools, demand for electricity also decreases. It is for this reason that generators tend to schedule regular maintenance to their facilities in fall, following a busy summer season and to prepare for winter peaks. Outages are also often scheduled in spring, which is another typically lower demand period.

The average price in Fall 2003 was higher than the summer, due in part to reduced availability of nuclear facilities that provide lower-cost power. This fall experienced an unusually high number of outages. For example, a large nuclear station was on a special planned outage for more than a month, while at the same time, a number of refurbished nuclear units were yet to come on-line.

Fall 2003 Peak	21,584 MW
Average Weighted Price	5.04 ¢/kWh
Average daytime price	6.33 ¢/kWh
Average nighttime price	3.99 ¢/kWh





Peak: This is the highest amount of hourly demand within that season. Seasonal peaks have been included for comparison.

Typical Day Demand Graph: This graph shows the demand pattern for a typical business day in that season. It shows how much electricity is used throughout the day and when it is used most.

Average Weighted Price: This is the average wholesale price for the season weighted by Ontario Demand. Weighting the wholesale price more closely reflects the final prices on your bill. Weighted averages will vary among utilities, reflecting demand patterns within their

service areas. (i.e. a community with a large proportion of industrial users will consume electricity differently from a community that is mostly residential.)

Daytime Average Price: This is an average weighted price for 8 a.m. to 8 p.m. (Monday – Friday.)

Nighttime Average Price: This is the average weighted price for 8 p.m. to 8 a.m. (Monday – Friday.) These numbers demonstrate the benefit of shifting consumption to lower demand periods.

Note that this section uses a slightly different time period (June 2003 to May 2004) than the market year.

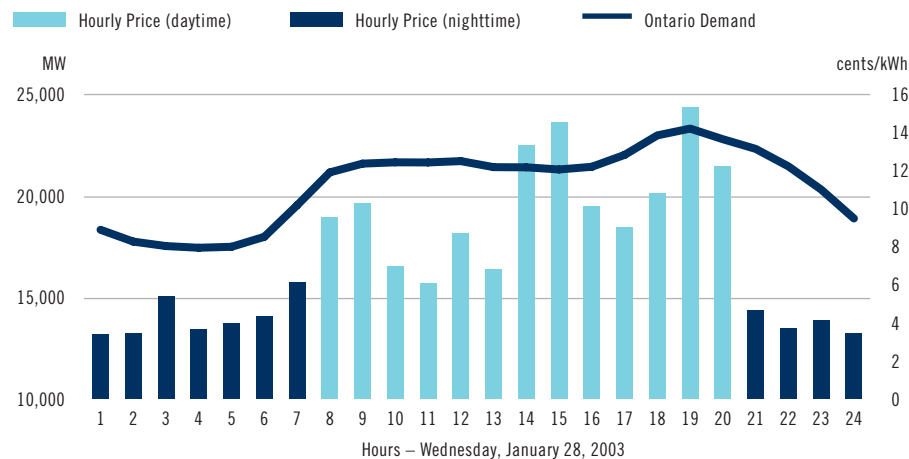
Winter (Dec 2003/Jan/Feb 2004)

The cold snap in Winter 2003-4 is reflected in Ontario's electricity demand figures and prices.

A new winter demand peak was set on January 15, with demand and prices higher than at other times of the year – as higher-priced electricity was used to meet demand. These higher prices were tempered, however, as there were adequate electricity supplies, including some refurbished nuclear units that were back in service and providing power.

Shorter winter days also contribute to higher overall nighttime prices as more lighting and heating is needed after-hours. Overall demand in the morning is higher as people turn on lights as they wake up. The supper-time peak is also more pronounced as people arrive home from work and turn up the heat, lights and appliances.

Winter 2003/4 Peak (Record)	
January 15, 2004	24,937 MW
Average Weighted Price	5.77 ¢/kWh
Average daytime price	7.12 ¢/kWh
Average nighttime price	4.92 ¢/kWh



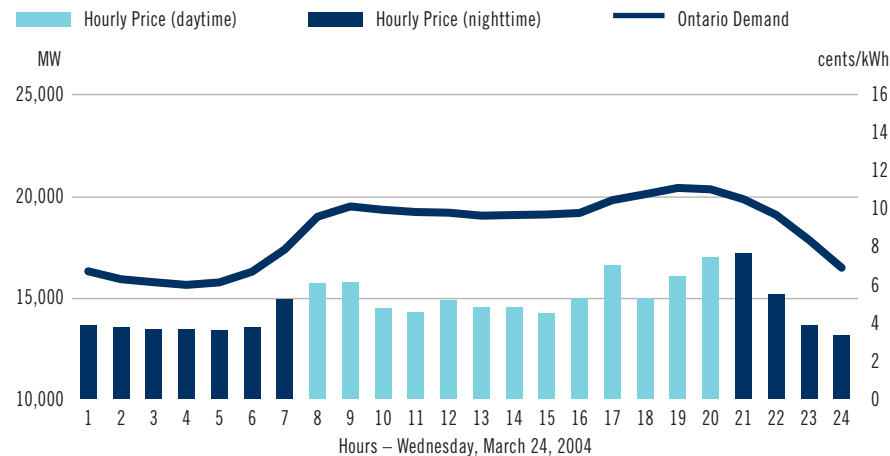
Spring (March/April/May 2004)

Spring weather brings lower overall demand and lower wholesale electricity prices.

Electric heating requirements are low, as people have turned off their furnaces and have yet to turn on their air conditioners. The longer days and daylight savings also means that people are less likely to turn on their lights as soon as they arrive home from work. As a result, demand patterns during the spring months start to change. While in winter, the peak takes place in the early evening, the spring peak can often take place late in the morning. Consumption generally remains steady throughout the day.

The other significant change taking place is the increased output from hydroelectric facilities. Water reservoirs are high, so these generators are running for more hours throughout the day. In the summer, these facilities are more likely to run only during high peak times, conserving their water supplies for times of day when it is most needed.

Spring 2004 Peak	21,634 MW
Average weighted price	4.94 ¢/kWh
Average daytime price	6.17 ¢/kWh
Average night-time price	4.09 ¢/kWh





Independent Electricity Market Operator

Ontario's electricity industry is made up of a number of different organizations, each with specific responsibilities. The list below provides contact information for organizations that can answer your questions about electricity in Ontario.

If you are a market participant, are interested in becoming a market participant or have questions about the role of the IMO, contact:

IMO

Tel: 905-403-6900

Toll-Free: 1-888-448-7777

Fax: 905-403-6921

E-mail: helpcentre@theIMO.com

IMO Reception 905-855-6100

IMO Media Line 416-506-2823

Local Utilities

For questions about your bill, energy consumption, power outages, and interval meters, contact your local utility. The IMO web site offers a complete list of electricity distribution companies in Ontario.

For information about latest developments in the electricity sector and government policy on electricity issues, contact:

Ontario Ministry of Energy

Phone: 1-888-668-4636

Web site: <http://www.energy.gov.on.ca/>

Questions about electricity charges or electricity retailers can be forwarded to:

Ontario Energy Board

Customer Service Centre

Tel: 416-314-2455

Toll-Free: 1-877-632-2727

Web site: <http://www.oeb.gov.on.ca/>

E-mail: info@oeb.gov.on.ca

For more information:

The IMO web site offers a wealth of information about the wholesale electricity market, including a special section for business and industry consumers (www.theIMO.com/business).

Here you will find:

- **Demand and Price Information:** Current day's actual and projected electricity demand and wholesale prices as well as the expected demand peak for the day.
- **Monthly Market Update:** Overview of previous month's demand and price information.
- **Power Outlook:** Forecasts for electricity demand and supply for the current quarter.