

The Electricity EXCHANGE

INSIDE:

Consultation on Bill 100	2
Energy RFPs	
Encourage Clean Air	2
Launch Date for Toronto's Deep Lake Water Cooling Project	3
Brascan Corporation's \$900M Deal	4
Pay-As-You-Go Electricity in Woodstock	4
Multi-Interval Optimization Goes Live	5
Monitoring Report on the Wholesale Market	5
Design Phase of Day Ahead Market Approved	5
Report on 18-Month Outlook	6
IMO 2003 Annual Report	7
Market Pricing Working Group Launched	7
NERC Post-Blackout Audit Report	7
Calendar of Events	8

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We welcome your comments, feedback or suggestions. Please send us an email at: electricity.exchange@theIMO.com

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Town of Milton Leads in Energy Efficiency

The town of Milton's interval metering project recently received top nods by Natural Resources Canada by being designated the 2004 recipient of the Canada Energy Efficiency Award.

With Milton expected to double in size by 2013 (to over 90,000 people), Milton Hydro is equipping every new home built within the Milton Hydro service area with an interval meter as a means of measuring energy consumption. Large industrial and commercial customers as well as residential consumers within this area benefit from interval meters as they can pattern their electricity consumption to take advantage of lower prices in off-peak periods. Don Thorne, President and CEO of Milton Hydro, believes that interval meters can change people's attitudes about electricity. "We've always focused on the supply-side relying on more generation — rather than on the demand side. Interval metering, combined with time varying pricing, encourages people to change their

habits by reducing discretionary consumption when prices are high. Moreover, other Ontarians benefit as the lowered on-peak consumption eases the overall strain on the province's supply of electricity."

Tracking hourly load and cost profiles through the use of interval, or "smart" meters, is made quite easy for Milton's customers as each meter is hooked up to a phone line allowing consumption to be tracked on a timely basis through the internet. The meters are also capable of recording natural gas and water use, thus allowing customers to track their overall utility consumption on an hourly, daily, weekly, monthly or even annual basis. In the near future, all interval metered customers will have the option of being notified of changes in market prices and conditions, thereby facilitating demand response. Thorne notes that, "customers need understandable, trustworthy, and timely information about their energy

Continued on Page 2



Don Thorne (right) President and CEO of Milton Hydro accepting the Energy Efficiency Award, March 22, 2004, from the Honourable R. John Efford (left), Minister of Natural Resources Canada

Town of Milton Leads in Energy Efficiency

Continued from Page 1

use to help them make their choices. Distributors are ideally situated to provide this information through appropriate enabling technologies and education programs.”

The interval meter project has caught the attention of the provincial government. As part of Premier McGuinty’s plan to reduce Ontario’s energy consumption by five per cent by 2007, the government has set aggressive targets to “put smart meters into every home by 2010, with an interim target of 800,000 meters in place by 2007.” Part of this plan would also allow for province wide access to net metering, enabling “homeowners and businesses generating renewable energy to receive credit for the excess energy they produce.”

Milton is already ahead of the curve in terms of implementing the government’s policy. By the end of 2003, over 800 new homes in the Milton service area had interval meters installed with an additional 1,800 installations expected during 2004.

More information on Milton’s interval metering project is available at: <http://www.miltonhydro.com>

Consultation on Bill 100 Set for Summer

The Ontario government introduced legislation on June 15 that proposes a restructuring of the province’s electricity system aimed at stabilizing prices across Ontario, addressing the need for new supply, facilitating demand management and encouraging conservation efforts. Bill 100, or the *Electricity Restructuring Act 2004*, will undergo consultation over the summer, with hearings expected in August,



Rick Jennings, Director of the Energy Supply and Competition Branch at the Ministry of Energy, reviews government legislation (Bill 100) at the June 23 Market Advisory Council Meeting

a final reading in the fall and implementation targeted for early 2005.

If passed, the legislation would:

- create the new Ontario Power Authority (OPA) to assess the adequacy and reliability of electricity resources, forecast future demand and provide leadership in conservation and demand management;
- rename the IMO the Independent Electricity System Operator (IESO) — which would continue to operate the wholesale market and be responsible for the reliability and operation of the power system;
- transfer the Market Surveillance Panel (MSP) from the IMO to the Ontario Energy Board (OEB);
- grant the OEB the authority to review and approve amendments to the market rules;
- set targets for conservation and renewable energy;
- allow consumers and small businesses who do not wish to participate in the regulated rate plan to purchase their electricity from energy retailers;
- offer a combination of regulated, contract and competitive market

prices for electricity to medium and large businesses; and

- enable the OEB to approve an annual rate plan for residential and other low-volume consumers based on regulated, contracted and expected market prices.

Bruce Campbell, the IMO’s Vice President of Corporate and Legal Affairs, says the IMO’s core responsibilities will continue under its new name. Whether it is the IMO or the IESO, “we have a very good reputation for our reliable core operations — whether that’s managing the power system, operating the market or managing settlements.”

The IESO’s Board will be made up of ten independent directors appointed by the Minister.

Clean Energy Encouraged through Energy RFPs

The Ontario Ministry of Energy recently initiated the Renewable Energy Supply Request For Proposals (RFPs) as a means of taking immediate action to meet its target of generating 5 per cent (1,350 MW) of renewable electricity capacity by 2007, and 10 per cent (2,700 MW) by 2010.

To initiate the process, the Ministry of Energy issued a Request for Qualifications on April 28, 2004, “to provide interested parties with advance information about the general framework, technical and financial requirements, evaluation criteria and key contract provisions that are expected to be part of the Renewables RFP.” On June 24, the Ministry of Energy released the Request for Proposals for 300 MW of Renewable Energy Supply. The proposal submission deadline is currently scheduled for August 25, 2004.

On June 25, the Ministry of Energy issued its Request for Information/



August Launch Date set for Toronto's Deep Lake Water Cooling Project

In line with the provincial government's aim at creating a culture of conservation and a cleaner Ontario, a joint venture between Enwave District Energy Limited and the City of Toronto promises a new and innovative source of renewable energy. Beginning mid-August, the Deep Lake Water Cooling project (DLWC) will provide a number of downtown Toronto high-rise buildings with a cleaner, alternative method of air-conditioning.

DLWC technology uses the naturally cold water from the depths of Lake Ontario as its energy resource. This water is used as both a source of drinking water for the City of Toronto and as an energy source to chill the return water in Enwave's district energy system (used for air-conditioning). The lake water, at 4°C, is drawn through intake pipes located approximately 83 metres below the lake's surface and subsequently processed at the Island Filtration Plant. After treatment, the now potable water travels to the John Street Pumping Station, where

it is passed through heat exchangers connected to Enwave's separate district energy loop. There, the city's drinkable water absorbs some of the thermal energy from Enwave's return water. After the transfer of heat, the drinkable water's temperature rises to 12.5°C and continues its way through the city's municipal water distribution system. The newly cooled return water is pumped to Enwave's Simcoe Street Cooling Plant where it is then further cooled for distribution to its customers.

Although the DLWC technology is not less costly than conventional cooling systems, many of the eligible buildings in the downtown core have signed on to Enwave's project. For some, the high cost associated with replacing aging air-conditioning equipment is enough to justify the switch to DLWC. For others, the long-term, fixed rate contracts are seen as a way to hedge against electricity prices. More importantly, the environmental benefits of the new system are quite significant. According to Enwave, DLWC uses 75% less energy than conventional air-conditioning systems. It reduces various emissions, including nitrogen oxide, sulphur dioxide, smog, greenhouse gases, as well as ozone-depleting chlorofluorocarbons (CFCs). In particular, DLWC is expected to reduce carbon dioxide emissions

Request for Qualifications (RFI/RFQ) for 2,500 MW of new clean generation and demand-side projects. This process is aimed at providing interested parties with information about "the general framework, technical and financial requirements, and key contract provisions that are expected to be part of the 2,500 MW RFP and to solicit comments from interested parties on the procurement requirements, evaluation criteria and contracted structures." The statement of qualifications submission deadline is currently scheduled for August 3, 2004, with the final form tentatively scheduled to be issued approximately two months after the release of the RFI/RFQ.

In support of these initiatives, the IMO recently launched a dedicated web page as a primary source of information for those interested in understanding the requirements involved in the RFP process, including making a new or modified connection to the IMO-controlled grid as well as becoming a participant in the IMO-administered markets:

http://www.theimo.com/imoweb/news/rfp_300MW.asp



Three five-km-long water intake pipes are submerged off the south end of Toronto Island and sunk to the bottom of Lake Ontario. Water is drawn through the intake pipes, treated, pumped and then transferred to the closed-loop cooling system. Drinking water is distributed to homes while chilled water is sent through air-conditioning circuits. The largest project of its kind in the world, the system is capable of cooling some 20 million square feet of space.

by 40,000 tons per year — or the equivalent of removing 8,000 cars from the road. Furthermore, when used at full capacity, DLWC could service more than 100 downtown Toronto office towers, thereby reducing electricity consumption by more than 50 million kilowatt hours per year and freeing up more than 40 MW of capacity from Ontario's electrical grid.

For more information on the DLWC project, visit: <http://www.enwave.com/enwave/dlwc.asp>

Brascan Corporation Enters \$900 Million Agreement with Reliant Energy Inc.



Lighthouse Hill on the Salmon River, Oswego County

On May 18, Brascan Corporation entered into a US \$900 million agreement with Reliant Energy Inc. to purchase 72 generating facilities totaling 776 MW of installed capacity for the Toronto-based company.

The portfolio consists of 71 hydroelectric facilities located in upstate New York, along with the Carr Street Generating Station, a fossil-fueled combined-cycle cogeneration plant in East Syracuse. In a recently issued press release, Brascan Power, a division of Brascan Corporation, stated that the newly acquired power will initially be sold on the wholesale electricity market, but will eventually be contracted to customers on a long-term basis as

the facilities are integrated with the company's existing operations in the northeast. The new acquisition brings Brascan Power's total assets to 120 plants with approximately 2,600 MW of generating capacity, predominantly in the northeastern U.S. and Canada.

More information on Brascan Power is available at: <http://www.brascanpower.com>

Pay-as-You-Go Electricity Use Gains Momentum in Woodstock

"Pay-as-you-go" is a concept many are familiar with when it comes to parking meters and cell phones. But for household electricity use, Woodstock is the only city in Canada that offers prepaid power as a payment option to its electricity consumers. By paying in advance, consumers are better able to budget, monitor and manage their electricity consumption.

This service offers a simple and unique mechanism for understanding the true value of electricity. When a customer decides to participate in the program, a smart meter is connected to the meter socket outside the resident's home. Inside the house, a power card reader is plugged into an electrical outlet that displays energy consumption — in both dollars and kilowatt hours. Similar to phone cards, customers are able to bring their power cards to Woodstock Hydro or a number of local

convenience stores and add money to their cards. As a result, payments are made at times and in amounts that are convenient for the consumer.

According to Gary Roth, President of Woodstock Hydro Services, "there are two reasons why customers conserve electricity with the pay-as-you-go system. The first is that the customer becomes more energy aware with the in-home display unit and can therefore monitor and manage their energy usage. The second reason is that with pre-pay, a customer starts treating electricity like a true commodity and puts a value on the electricity they have purchased. Just as a customer tries to get the most value (mileage) when they purchase gas for their car, a customer on pay-as-you-go also tries to get the most value from their electricity purchase." The simple act of pre-paying for electricity encourages consumers to seek the best value for their money resulting in better conservation habits. Woodstock Hydro has found that customers who choose to participate in the pre-paid power program consume 15-20% less energy than those who use the traditional monthly billing system — equivalent to an average monthly savings of between \$10-\$20.

The program further enables Woodstock Hydro to save money through the elimination of meter reading and invoicing for their pay-as-you-go customers. Approximately 2,600 (or 25%) of Woodstock Hydro's customers take part in the pre-paid power program which has no entry or departure costs associated with the plan.



Fast Facts about the Market

May 1, 2003 to April 30, 2004

- Weighted Average HOEP based on the Ontario Demand: \$50.67/MWh
- Peak Ontario Demand on January 15, 2004: 24,937 MW
- Total Imports: 9.81 TWh
- Total Exports: 7.13 TWh



Multi-Interval Optimization (MIO) Goes Live

The IMO software that determines dispatch instructions has now been enhanced so that it optimizes over a number of intervals rather than over just a single interval. Optimizing over a rolling period of up to 11 intervals is expected to result in lower overall dispatch costs within the market, enhance unit scheduling and begin to address a number of real-time dispatch issues identified by market participants. Part of the Market Evolution Program, the MIO project is expected to address a number of dispatch issues in this initial implementation and through future enhancements. Affecting the constrained dispatch schedule only, MIO does not impact the unconstrained (market) schedule or market prices derived from it.

Through the introduction of these enhancements, generating participants are now able to register additional generating facility characteristics, such as periods of steady operation and forbidden regions. Participants who wish to register this information can do so by submitting IMO Form 1558 (http://www.theimo.com/imoweb/pubs/marketEntry/me_f1558_Add_Gen_Facility_Char.doc) to registration@theIMO.com.

Additional information on these enhancements and future improvements are described in the most current Quick Take: "Multi-Interval Optimization," available

on the IMO Web site at: http://www.theimo.com/imoweb/pubs/training/QT14_MIO.pdf

Monitoring Report on Ontario's Wholesale Electricity Market Released

Covering the winter of 2004, the fourth monitoring report of the Market Surveillance Panel on the IMO-administered markets confirmed that there was no evidence of gaming or abuse of market power. The report, released on June 14, also concluded that increased supply from nuclear and gas plants, coupled with lower overall average demand, resulted in lower energy prices during the winter 2004 (January excepted) as compared to the previous year.

Commenting on the April government policy announcements, the Panel stated that it welcomed "the comprehensive nature of the government's plans and the conscious effort to provide a more certain regulatory and public policy environment." It also lauded the government's decision to continue the wholesale market and added that "a properly functioning wholesale market is central to an effective electricity sector in Ontario."

As usual, the report contained an analysis of anomalous market outcomes during the winter, this time including an account of the events of January 15 — one of the coldest days of the winter.

The Market Surveillance Panel is an independent arms-length body appointed by and reporting to the Independent Directors of the IMO. The mandate of the Panel is to monitor, and where appropriate, investigate the activities and conduct of participants in the markets that the IMO administers and make any recommendations it feels are appropriate.

The full report is available at: http://www.theimo.com/imoweb/pubs/marketSurv/ms_mspReport-20040614.pdf

Design Phase of Day Ahead Market Approved

The IMO Board of Directors recently approved funding for Phase 4 of the Day Ahead Market (DAM) project, thereby allowing for the completion of the project's design phase. Spanning from July 2004 to January 2005, Phase 4 will complete the detailed market design, develop both the system design and the IMO's business processes, create the necessary market rules to support the project's implementation and produce the initial set of educational materials. The development of the design will continue to gather stakeholder input from both the Day Ahead Market Working Group as well as from a broader stakeholder audience.

By late 2004/early 2005, a final business case will be submitted to the IMO Board for Phase 5 approval with costs based on actual systems supply proposals. Phase 5 will build and test the IMO systems and processes necessary to operate the market.

The proposed design is expected to increase reliability by reducing intertie transaction failures, make it easier for loads and generators to manage their costs and risk, improve the IMO's assessment of resource adequacy in advance of real-time operation, and create an environment in which bids and offers better reflect

the cost of energy.

More information on the DAM is available on the IMO Web site at: http://www.theimo.com/imoweb/consult/mep_dam.asp

Paul Bradley Appointed to IMO Technical Panel



On June 10, the Board of Directors appointed a new member to the IMO's Technical Panel for a three-year term beginning July 13, 2004. Representing the financial services community, Paul Bradley is the Managing Director of PJBTO Associates Ltd. — a consultancy organization dedicated to infrastructure related industries as well as all aspects of corporate finance and business development activities. Prior to his appointment with PJBTO, Mr. Bradley served as Executive Director, Investment Banking for CIBC World Markets where he was responsible for strategic initiatives and financial advisory engagements in the Global Power and Utilities Group. Mr. Bradley will be replacing Bill Rupert on the Technical Panel.

18-Month Outlook Shows Improved Reliability Forecast

The outlook for the reliability of Ontario's electricity system for the next 18 months has improved substantially compared to this time last year, according to the IMO's 18-Month Outlook released on June 23. The improved short-term forecast reflects the additional generation available heading into the summer of 2004 compared to the last two summers. Three nuclear units have returned to service and the addition of five gas-fuelled generating units is expected to be completed by August 2004.

"This additional 2,800 MW of capacity in a 12-month period significantly improves Ontario's ability to meet peaks in electricity demand that occur during the summer and winter months," said Paul Murphy, Chief Operating Officer for the IMO.

The new Outlook also reflects the progress that has been made to address the impact of the planned shutdown of Lakeview Generating Station in April 2005. The shutdown will remove 1,150 MW of coal-fired generation and requires that certain transmission system improvements be completed by Hydro One in the Greater Toronto

Area. Implementation of the plans to address the needed transmission system improvements is well underway.

The planned shutdown of the Lakeview station, along with the aging of many other Ontario generating stations, means that Ontario will require new generation and conservation projects to ensure the long-term reliability of the province's electricity system.

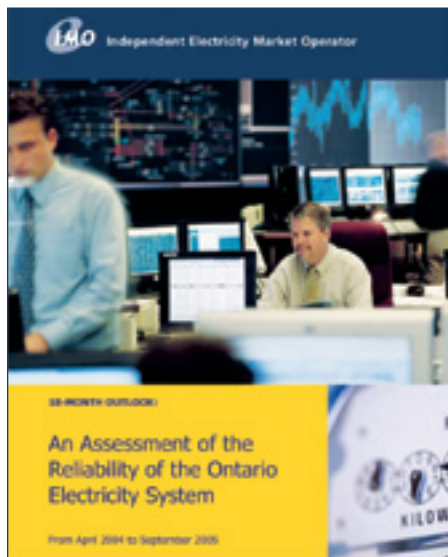
The full 18-Month Outlook is available at: http://www.theimo.com/imoweb/pubs/marketReports/18MonthOutlook_2004jun.pdf

PowerStream Inc. becomes Ontario's Third Largest Distribution Company



The electricity distribution utility created from the merger of Hydro Vaughan, Markham Hydro and Richmond Hill Hydro recently unveiled its new company name — *PowerStream Inc.* The merger, which was finalized in March of this year, makes PowerStream Inc. the third largest local distribution company in Ontario, with over 190,000 residential and business customers.

"We believe that PowerStream is the ideal name for this new and dynamic company," Town of Markham Mayor and PowerStream Board Member Donald Cousens notes. "It not only captures the essence of the service we provide and the industry we belong to, but it also describes our core function in a contemporary manner to more effectively communicate the



technological aspect involved in distributing electricity.”

The new logo features a stylized lightning bolt, coloured in blue to represent both electricity and a stream of water. City of Vaughan Mayor and PowerStream Board Member Michael Di Biase explains that their signature slogan — “*Your Current Connection*” — conveys several meanings. “It ties back extremely well to the company name and logo as well as the fact that we are involved in the electricity distribution business.”

Both Cousens and Di Biase agree that the merger will ultimately benefit residents and businesses in all three municipalities by establishing a much more viable electricity distribution company, committed to providing its customers with both reliable and efficient service.

PowerStream Inc. is jointly owned by the City of Vaughan and the Town of Markham. For more information on the merger, visit the company’s Web site at: <http://www.powerstream.ca/>

2003 Annual Report Highlights IMO’s Role in Maintaining a Reliable Electricity System

Effective planning and forecasts, high reliability standards, skilled system operations and an efficient, competitive wholesale market — are all elements that contribute to a reliable electricity system. Released on June 3, the IMO 2003 Annual Report “At the Heart of Ontario’s Power System” outlines the IMO’s role in managing Ontario’s electricity system —including leading the restoration of power following the August 2003 blackout.

“Electricity system reliability has always been one of the IMO’s key goals and strengths,” says IMO President and CEO Dave Goulding. “The August blackout brought greater



attention to this important role in 2003. Not only did the IMO, together with Ontario’s market participants, restore power to almost all Ontarians within 30 hours after the blackout, but our standards and model for reliability have proven to be exemplary in post-blackout examinations in Canada and the U.S.”

The report also highlights the IMO’s achievements in the first full year since the opening of the market. These included continuing to evolve the market with a number of new initiatives such as the Hour Ahead Dispatchable Load program which offers greater flexibility for large consumers to adjust their consumption in response to market prices.

The full report is available on the IMO Web site at: <http://www.theimo.com/imoweb/pubs/corp/IMO2003AnnualReport.pdf>

New Market Pricing Working Group Launched

Under the Market Evolution program, the Market Pricing Working Group (MPWG) was established in May to provide a forum for market

participants and other stakeholders to discuss concerns and issues related to price determination in the IMO-administered markets. Since their first meeting, working group members have already addressed a number of pricing issues, including pre-dispatch vs. dispatch pricing, 12-times ramp rate and uniform vs. nodal pricing. One of the working group’s first deliverables will be the “Pricing Issues Report,” aimed at assembling an inventory of pricing issues, along with each issue’s character and potential impact on market participants and/or market operations.

More information on the MPWG, including a calendar of future meetings and supporting materials, is available at: http://www.theimo.com/imoweb/consult/mep_mp.asp

NERC Post-Blackout Audit Provides Positive Assessment of IMO

The North American Electric Reliability Council (NERC) recently granted the IMO a very positive independent review of its readiness to meet its responsibilities as a control area.

In the wake of last August’s blackout, NERC established a program to audit all electricity System Coordinators and Control Area Operators in North America as a means of highlighting any deficiencies that could result in future blackouts.

In assessing the degree to which the IMO meets its responsibilities as a control area, the NERC Readiness Audit team concluded that the IMO has the “appropriate reliability plans, procedures, processes, tools and trained personnel in place to respond to unplanned events on their system.” The report further highlighted the IMO’s monitoring capability and excellent processes for planning in both real-time operations and longer-term horizons. With respect

to the events of August 2003 more specifically, the audit team noted that the “IMO has a robust restoration plan that is simulated and trained on regularly.” Overall, NERC commended the IMO for a “thorough, professional operation” but did caution that Ontario’s decision to shut down coal-fired generation by 2007 will leave the province short of the reserves critical to operate a reliable electricity system.

The full report is available at:
http://www.theimo.com/imoweb/pubs/ircp/NERC/NERC_IMO_Audit_Report-2004.pdf

Peterborough Group of Companies Flourishes Post Market Opening

For the better part of the last century, the Peterborough Utilities Commission (PUC) has provided electricity and water to the people of Peterborough. Having had a close relationship with Canadian General Electric (CGE), the city’s major employer for numerous years, PUC developed its own hydraulic generation and load management program through the use of CGE technology. While many load management systems were abandoned at market opening, Peterborough continued its program, the key element being the radio control of 12,000 electric water heaters.

Over the years, the efficiencies of shared services between the water and electric utility were refined. To protect this relationship, a services company was formed that supplies common services to both the electric companies and the water utility. Both are governed by one of the few remaining “commissions” in the province. To ensure that costs are accurately tracked, an activity based costing exercise was completed at the time of

Events Calendar

July to September 2004

More information on these and other events is available at:
<http://www.theimo.com/imoweb/events/calendar.asp>

July 27
 July 28
 July 28-31

Technical Panel Meeting
 Day Ahead Market Working Group Meeting
 2004 Large Engineering Systems Conference on Power Engineering, Institute of Electrical & Electronics Engineers, Inc. (Halifax, N.S)

August 6
 August 20
 August 24-25
 August 26

Market Pricing Working Group Meeting
 Market Pricing Working Group Meeting
 Technical Panel Meeting
 Revenue Metering Sub-Committee Meeting

September 3
 September 7-8
 September 8
 September 17
 September 21-22
 September 28-30

Market Pricing Working Group Meeting
 Technical Panel Meeting
 Market Operations Standing Committee Meeting
 Market Pricing Working Group Meeting
 Technical Panel Meeting
 Canada Power Conference (Toronto Congress Centre)

*Note: All events in Toronto unless noted otherwise

market opening.

Since May 2002, Peterborough has acquired two small neighbouring Local Distribution Companies (LDCs) and a generating station, previously owned by the Town of Campbellford, and continues to seek opportunities to acquire or develop new sources of generation. In addition, Peterborough

has also developed a thriving Meter Data Management Agent (MDMA) and Meter Service Provider (MSP) business. Today, it is one of the largest suppliers of these services in Ontario, with expectations of growing these meter related services to customers outside of the province in the near future.



Peterborough Hydro's London Street Generating Station