



**Memo to: Paul Bradley, Vice President, Generation Development, Ontario Power Authority**  
**From: Jack Gibbons, Ontario Clean Air Alliance**  
**Re: OPA's Procurement Processes for Electricity Resources**  
**Date: July 27, 2005**

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## **Introduction**

Pursuant to your letter of July 8, 2005, we are writing to provide you with the Ontario Clean Air Alliance's recommendations with respect to the Ontario Power Authority's (OPA's) procurement processes for electricity resources.

## **Demand Response**

Paying customers to reduce their demand during periods of peak system demand can provide significant benefits to Ontario, including:

1. Reduced need for high-cost coal-fired electricity imports from the United States. In 2002, on peak days, Ontario paid up to 60 cents per kWh for U.S. coal-fired electricity imports.<sup>1</sup>
2. Reduced need for new electricity generation and transmission infrastructure.
3. A dramatic reduction in the spot price of electricity. For example, according to National Economic Research Associates, a 2–5% reduction in demand on peak days could reduce spot prices by 50% or more.<sup>2</sup>
4. Reduced risk of blackouts and brownouts.

The Independent System Operator New England (ISO New England), the New York Independent System Operator and the Pennsylvania-New Jersey-Maryland Interconnection have all established demand-response programs that pay their customers to reduce consumption during periods of system peak demand and/or supply shortages. For example, the ISO New England pays its customers up to \$1 per kWh to reduce demand during peak periods.<sup>3</sup> According to ISO New England:

“Demand response participants provide an important resource for New England. They help ensure the power grid's reliability, reduce wholesale volatility that drives up the cost of power for everyone, and reduce air pollution by enabling older, less efficient power plants to run less often.”<sup>4</sup>

Ontario's Independent Electricity System Operator (IESO) has recently implemented a weak and ineffectual demand-response program. At a maximum, the IESO's program will only purchase an aggregate total of 100 MW of demand reductions from electricity

consumers, despite the fact that the province's peak day demand in 2005 has exceeded 26,000 MW. Therefore, at best, the IESO's program will reduce peak-day demand by less than 4/10ths of 1%.

The OPA should pay large industrial, institutional and commercial consumers, electric utilities (e.g., Toronto Hydro) and market aggregators (e.g., Ozz Corporation) the same price per kilowatt-hour (kWh) for demand reductions (a negawatt) as it pays generators for electricity supply during peak demand periods. Furthermore, the OPA should purchase all available demand reductions whenever Ontario's electricity demand is 20,000 MW or greater and/or the price of electricity is 7 cents per kWh or greater.

If the OPA pays the electric utilities to reduce their consumption during peak periods, the utilities can implement programs to occasionally cycle off selected major appliances of their residential and commercial customers for short time periods in exchange for a monthly discount on their electricity bills. For example, Florida Power and Light's *Residential On Call* program pays customers for permission to cycle off their air-conditioners, water heaters and pool pumps for short periods of time.<sup>5</sup>

### **Renewable Power**

In April 2005, Energy Minister Duncan announced that the Government will conduct competitive bidding processes in 2005 to purchase up to an additional 1,200 MW of green power.<sup>6</sup>

The Ontario Power Authority (OPA) should have annual competitive bidding processes for green power. If the OPA were to purchase an additional 1,200 MW of green power per year for 10 years, by 2015 its new green power supplies would be equivalent to 24% of Ontario's total electricity generation in 2003.<sup>7</sup>

A competitive bidding process is the best option to obtain renewable power from large investor-owned power companies. However, for individuals, farmers and local community organizations interested in developing small renewable power projects, participating in the OPA's competitive bidding process is simply not feasible. It is too costly and complex given their likely returns.

Therefore to facilitate the development of small-scale (10 MW or less) projects, the OPA should establish standard offer prices for these projects and should enter into electricity supply contracts with all small-scale renewable projects that are willing to accept the standard offer price. Prices determined by the competitive bidding processes should be used as benchmarks to establish the standard offer price, which could be adjusted to recognize the added benefits of small, geographically diverse renewable supplies.

### **Natural Gas- and Biomass-fired Combined Heat and Power**

Virtually all of Ontario's buildings and factories use natural gas for heating. However, it is much more productive to use natural gas (or biomass) to simultaneously produce two

services -- heat and power (electricity). The energy efficiency of a combined heat and power plant can exceed 80%; whereas the energy efficiency of Ontario's dirty coal-fired power plants is approximately 34%.<sup>8</sup>

According to a report prepared for the Ontario Ministry of Energy, Ontario's total combined heat and power potential in 2020 will be 16,514 MW.<sup>9</sup> This is equivalent to 95% of Ontario's existing installed coal and nuclear generation capacity.<sup>10</sup>

Many U.S. jurisdictions are moving quickly to embrace distributed combined heat and power projects through coordinated initiatives that facilitate technology transfer, promote the development of standardized off-the-shelf equipment, ensure equal access to the grid for self-generators and raise awareness of the potential for everyone from farmers to municipalities to industries to develop combined heat and power projects. (See the Northeast Combined Heat and Power Initiative, [www.northeastchp.org](http://www.northeastchp.org), for example.)

Unfortunately combined heat and power faces very significant market barriers that are thwarting its development in Ontario. As a result in 2005, when the Government of Ontario used a competitive bidding process to contract for 2,225 MW of new natural gas-fired generation capacity, only 90 MW or 4% of this new capacity was combined heat and power despite the fact that it is the lowest-cost option for producing electricity from natural gas.<sup>11</sup>

There are several market barriers to combined heat and power beginning with such projects requiring a host facility (e.g., a recreation centre, shopping centre, wastewater treatment plant, office building or factory). However, the host facilities are typically reluctant to become electricity generators or enter into a partnership agreement with a power producer to produce electricity for a number of reasons. They are as follows:

- Ontario's subsidized prices for grid-supplied electricity reduce a host facility's incentive to generate its own power.
- Host facilities that meet some or all of their electricity requirements from combined heat and power are required to pay the province 0.7 cents for each kWh that they self-generate in order to help pay-off Ontario's \$20 billion unfunded electricity liability.
- The timing of the Government's competitive bidding processes is unlikely to be consistent with investment planning processes of potential combined heat and power host facilities.
- For small-scale combined heat and power projects, the costs of participating in the Government's competitive bidding processes for new supply is simply too great.

Therefore to facilitate the development of combined heat and power projects, the OPA should establish a standard offer price for combined heat and power projects and enter into electricity supply contracts with all combined heat and power projects that are willing to accept the standard offer price. Prices determined by the competitive bidding processes for natural gas-fired combined-cycle power plants should be used as benchmarks to help set the standard offer price. The price should also vary with the

project's size and energy efficiency. A price premium should be paid for the most energy efficient combined heat and power plants.

### **Natural Gas-Fired Combined-Cycle Power Plants**

Natural gas-fired combined-cycle power plants can achieve energy efficiencies of up to 60%.<sup>12</sup> As a consequence, since it will take several years for Ontario to fully develop its conservation, renewable energy and combined heat and power potential, natural gas-fired combined-cycle power plants have an important role to play as a bridging technology.

As a result of a competitive bidding process in 2005, the Government of Ontario entered into 20-year supply contracts for four natural gas-fired combined-cycle power plants. The average cost of these new supplies, based on the previous two years actual natural gas prices and a 45% capacity factor, is 7.8 cents per kWh.<sup>13</sup> Based on a 90% capacity factor, the cost of these new supplies will fall to 6.8 cents per kWh.<sup>14</sup> Based on the U.S. Department of Energy's natural gas price forecast and a 90% capacity factor, the cost of these new electricity supplies will be approximately 6 cents per kWh in 2010.<sup>15</sup>

The contracts for these new supplies contain a number of stringent conditions to ensure stable pricing and reliable supplies, including that:

- If the power plant fails to achieve its Milestone Date for commercial operation, the independent power supplier will be required to pay the Government up to \$300 per MW of contracted capacity per day for each day after the Milestone Date until commercial operation is achieved.
- The Government can terminate an independent power supplier's contract if it is 18 months late in bringing its power online.
- The Government can also terminate the supply contract if the power plant is unable to achieve capacity utilization rates of 70% during the second contract year; 75% during the third contract year; and 80% during the fourth and each subsequent contract year.
- Moreover, if the Government terminates the contract for one of the above reasons, the independent power supplier is required to pay the province's incremental cost of obtaining replacement power for the duration of the original contract term.

As other jurisdictions, such as California, have discovered, including such provisions is essential to ensuring that contracted power supplies are delivered on-time and on-budget. Similarly, Ontario's recent experiences with huge cost overruns and delays in re-starting its nuclear units points to the need for proper controls and guarantees for all new power supply contracts.

### **Nuclear Power**

In 2005, the Government of Ontario contracted for 2,225 MW of natural gas-fired power supplies via a competitive bidding process. This competitive bidding process was open to renewable, natural gas and nuclear power suppliers. However, the Government did not

receive a bid from Ontario's largest independent power producer, Bruce Power, which would prefer a special "out-of-market" contract with the Government of Ontario to finance the re-start of its two shutdown nuclear reactors.

Bruce Power's refusal to participate in this competitive bidding process is an implicit admission that re-starting its shutdown nuclear reactors is a higher-cost and higher-risk option to meet Ontario's electricity needs than building new high-efficiency natural gas-fired power plants.

The Ontario Clean Air Alliance believes that the least-cost and least-risk options to meeting Ontario's incremental electricity needs are energy conservation, new renewables and high-efficiency natural gas-fired power plants. If the Government believes that re-investing in nuclear power is a viable option to meet Ontario's incremental supply needs, we urge the Government to establish a competitive bidding process for new supplies where nuclear suppliers are required to compete on a level playing field with suppliers of high-efficiency natural gas-fired combined-cycle power plants.

Specifically to create a level playing field between natural gas combined-cycle power plants and nuclear power, all nuclear re-start or new build proposals must be subject to the same terms and conditions as natural gas-fired power plants, namely:

- The nuclear power producer must be subject to the same financial penalties and risks of contract termination for failure to achieve its commercial in-service dates or capacity utilization rates as natural gas power plant producers.
- Any nuclear cost overruns must be borne 100% by the nuclear power producer and not passed on to electricity consumers.

In addition, the nuclear power producer must be responsible for 100% of the costs associated with the decommissioning of its nuclear power plant, the long-term storage of its radioactive wastes; and a catastrophic accident at its plant.

## Endnotes

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<sup>1</sup> Ontario Energy Board Docket No. RP-2003-0144, Hydro One Networks and Hydro One Brampton, *Electricity Demand in Ontario*, (November 2003), p. 5.

<sup>2</sup> Michael Rosenzweig et al., "Market Power and Demand Responsiveness: Letting Customers Protect Themselves", *Electricity Journal*, (May 2003).

<sup>3</sup> ISO New England, *ISO New England 2004 Demand Response Programs*.

<sup>4</sup> ISO New England, *ISO New England 2003 Demand Response Programs*.

<sup>5</sup> [http://www.fpl.com/home/services/contents/residential\\_on\\_call.shtml](http://www.fpl.com/home/services/contents/residential_on_call.shtml).

<sup>6</sup> Ontario Ministry of Energy, *News Release*, "McGuinty Government Seeks More Clean, Green, Renewable Energy", (April 19, 2005).

<sup>7</sup> In November 2004 the Government of Ontario signed contracts for 395 MW of new renewable capacity which is forecast to produce 1.2 billion kWh of electricity per year. If the next 12,000 MW of renewable

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capacity (1,200 MW per year x 10 years) has the same capacity utilization rate as the first 395 MW, it will provide 36 billion kWh of electricity. In 2003 Ontario's total electricity generation was 152 billion kWh. Ontario Ministry of Energy, *Results of the 300 MW Renewable RFP*, (November 24, 2004), Slide 11; and <http://www.ieso.ca/imoweb/marketdata/marketSummary.asp>.

<sup>8</sup> Ontario Ministry of the Environment, *Coal-Fired Electricity Generation In Ontario*, (March 2001), pp. 42, 43.

<sup>9</sup> Hagler Bailly Canada, *Potential for Cogeneration in Ontario: Final Report*, (August 2000), p. 25.

<sup>10</sup> Independent Electricity System Operator, *18-Month Outlook: An Assessment of the Reliability of the Ontario Electricity System*, (June 27, 2005), p. 5.

<sup>11</sup> Ontario Ministry of Energy, *News Release*, "McGuinty Government Gives Green Light To Two New Gas Plants" ( May 30, 2005 ); and Ontario Ministry of Energy, *Backgrounder*, "Contract Structure and Pricing", (May 30, 2005).

<sup>12</sup> Ontario Ministry of the Environment, *Coal-Fired Electricity Generation In Ontario*, (March 2001), p. 43.

<sup>13</sup> Ontario Ministry of Energy, *News Release*, "McGuinty Government Gives Green Light To Two New Gas Plants", (May 30, 2005).

<sup>14</sup> Email to Jack Gibbons, Ontario Clean Air Alliance from Rick Jennings, Acting Assistant Deputy Minister of Energy, Province of Ontario, June 16, 2005.

<sup>15</sup> The U.S. DOE is forecasting that the wellhead price of natural gas in 2010 will be \$3.64 (2003 US\$) per thousand cubic feet. U.S. Department of Energy, Energy Information Administration, *Annual Energy Outlook 2005: With Projections to 2025*, p. 9; and email to Jack Gibbons from Rick Jennings, Acting Ontario Assistant Deputy Minister of Energy, July 7, 2005.