



December 10, 2012

Kirsten Walli
Board Secretary
Ontario Energy Board
P.O. Box 2319
2300 Yonge Street, Suite 2700
Toronto, ON M4P 1E4

Subject: **Board File No.: EB-2012-0340 – Consultations Regarding Incentive Rate Making Options for Ontario Power Generation’s Prescribed Generation Assets – Comments on Written Submission from IESO**

Dear Ms. Walli,

On behalf of the Ontario Society of Professional Engineers (OSPE), please find our comments on the written submission dated October 31, 2012 from the Independent Electricity System Operator (IESO) posted on your website.

We are concerned about the rising cost of electricity well beyond the inflation rate and by IESO market data that suggests some of Ontario Power Generation’s (OPG’s) prescribed generation assets are being operated in a manner that makes it more difficult for the IESO operators to manage the supply/demand balance in a way that is consistent with the public’s environmental goals.

The enclosed commentary summarizes our views. We make four key points:

- Current contract prices and terms and conditions for OPG’s prescribed generation assets also provide unintended incentives to OPG that encourage the wasting of “green” energy.
- The current price incentive that encourages nuclear production over hydroelectric production can be easily eliminated.
- OSPE supports the IESO’s present plans to dispatch wind and solar generation to help manage surplus baseload generation (SBG) and operational transients, but those plans should not be seen as a complete solution to managing SBG.
- OSPE believes that the Adam Beck Pump Generating Station (PGS) pumped storage assets should be an ancillary service to the electrical grid to help the IESO balance supply and demand.

We welcome any comments or questions you may have. We are also pleased to make our Energy Task Force members available to you should your staff wish to organize a meeting with affected stakeholders to share views and answer any questions. If you would like to arrange a meeting please contact Kristian Kennedy, Policy Analyst, at 416-223-9961 x 225.

Thank you for considering the views of the professional engineering community. Professional engineers are directly involved in designing, constructing, operating and maintaining our province's energy infrastructure. We hope our recommendations are helpful to your planners in creating a more reliable, safer, environmentally responsible electrical energy system that also provides a competitive advantage to Ontario businesses.

Yours truly,



Nadine Miller, M.Eng., P.Eng.
President & Chair

cc:Hon. Chris Bentley, Minister of Energy

Michael Reid, Assistant Deputy Minister, Regulatory Affairs and Strategic Policy Division,
Ministry of Energy

Paul Murphy, B. Sc., P. Eng., President and CEO, Independent Electricity System Operator

Bruce Campbell, Vice-President, Resource Integration, Independent Electricity System Operator

Jessica Savage, Supervisor, Regulatory Affairs, Independent Electricity System Operator

Tom Mitchell, M. Eng., President and CEO, Ontario Power Generation

Bruce Boland, Senior Vice President, Corporate Affairs, Ontario Power Generation

Steve Orsini, Chair and Deputy Minister of Finance, Ontario Electricity Financial Corporation,
Ministry of Finance

Colin Andersen, M.A., CEO, Ontario Power Authority

Dr. Michael Binder, Ph.D., President and CEO, Canadian Nuclear Safety Commission

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EB-2012-0340 – Consultations Regarding Incentive Rate Making Options for Ontario Power Generation's Prescribed Generation Assets – Comments on Written Submission from IESO

We would like to comment on the written submission dated October 31, 2012 from the Independent Electricity System Operator (IESO) posted on your website. The IESO submission raises important issues that we believe deserve consideration by the OEB. If such issues are outside the scope of the current consultation we encourage the OEB to deal with them at a future date and allow all stakeholders to present their views. The views of the Ontario Society of Professional Engineers (OSPE) are summarized below for your information.

OSPE is the advocacy and member services body for Ontario's Professional Engineers. We have an interest in this file because our energy sector members plan, design, operate, maintain and decommission Ontario's electricity infrastructure. Our members in other industries are also impacted by the cost and reliability of Ontario's electricity system.

With the exception of storage based generation assets, OSPE supports the IESO's written submission that suggests the Hourly Ontario Electricity Price (HOEP) should result in sufficient incentives to efficiently dispatch all forms of generation based on the incremental cost of production. OSPE also agrees with the IESO that one of the problems creating non-efficient dispatch of Ontario Power Generation's (OPG's) prescribed generation assets is the fact that OPG's contracts, administered by the OEB, do not expose OPG to the market price in all circumstances.

Nevertheless, our members are concerned about the rising cost of electricity well beyond the inflation rate and projections by the government that those large increases are expected to continue for several years. We are also concerned by IESO market data that suggests some of OPG's prescribed generation assets are being operated in a manner that makes it more difficult for the IESO operators to manage the supply/demand balance in a way that is consistent with the public's environmental goals.

We make four main points. First, OSPE is concerned that the current contract prices and terms and conditions for OPG's prescribed generation assets also provide unintended incentives to OPG that encourage the wasting of "green" energy. Second, OSPE suggests the current price incentive that encourages nuclear production over hydroelectric production can be easily eliminated. Third, while OSPE supports the IESO's present plans to dispatch wind and solar generation to help manage surplus baseload generation (SBG) and operational transients, those plans should not be seen as a complete solution to managing SBG. Lastly, OSPE believes that the Adam Beck Pump Generating Station (PGS) pumped storage assets should be an ancillary service to the grid to help balance supply and demand.

Current Contract Prices and Terms and Conditions for Prescribed Generation Assets at OPG

OSPE is concerned that the current contract prices and terms and conditions for OPG's prescribed generation assets provide unintended incentives to OPG that encourage the wasting of "green" energy, namely spilling water resources, and encourage the production of nuclear energy along with its associated nuclear waste during periods of surplus base load generation (SBG). OPG currently gets paid more to produce nuclear energy than it does to produce hydroelectric energy. During periods of SBG when OPG must curtail production, there is currently a financial incentive for OPG

to reduce hydroelectric production rather than reduce nuclear production. If there were no engineering solutions to allow nuclear reactors to reduce production on a daily basis during SBG conditions, then the concern we have would be moot. However, there are engineering solutions that would allow OPG's CANDU reactors to load follow without an extended shutdown. This has been demonstrated recently by the fact that Bruce Power has modified its units to permit a significant amount of load following capability (approximately 300 MW per unit). There are other engineering solutions to permit even greater load following capability and also reduce the amount of nuclear waste. These alternate solutions would come at a higher cost than the solution implemented by Bruce Power. Because the production of nuclear waste is a serious public policy issue, OPG's production incentives should not only be based on cost but also on public policy goals such as the reduction of nuclear waste production when practical.

The Current Price Incentive, Nuclear Production and Hydroelectric

OSPE suggests the current OEB regulated prices that set nuclear rates higher than hydroelectric rates provide an unintended price incentive that encourages nuclear production over hydroelectric production. This unintended price incentive can be easily eliminated. OPG's prescribed hydroelectric assets were recapitalized when OPG's predecessor company, Ontario Hydro, was restructured at a much lower electricity price than we have today. If the portion of the stranded debt paid by ratepayers and held by the Ontario Electricity Financial Corporation (OEFC) were reassigned back into the hydroelectric assets of OPG then the new rate for hydroelectric regulated assets would:

- Create incentives for OPG to curtail nuclear production before hydroelectric production
- Create incentives for OPG to curtail nuclear production to eliminate severe SBG
- Eliminate the need to charge a stranded debt charge on consumers' electricity bills
- Keep the total cost of electricity to ratepayers the same after the recapitalization we are proposing
- Keep OPG financially whole by raising its regulated rate for hydroelectric production to cover the cost of servicing the stranded debt transferred to its balance sheet.
- Provide incentives for OPG to find and implement engineering solutions that will allow its reactors to load follow and, ideally, either reduce nuclear waste production or, make steam available to industry near its nuclear plants with a zero greenhouse gas footprint.

It is OSPE's estimate that the elimination of the stranded debt charge of 0.7 cents/kWh on consumers bills and a corresponding increase in the global adjustment (GA) of 0.7 cents/kWh will keep electricity rates unchanged for consumers and will generate the required funds to keep OPG financially whole. The new rate for the hydroelectric regulated assets would be in the range of 7 to 8 cents/kWh. The resulting price spread between the hydroelectric energy rate and the nuclear energy rate will be approximately 2 cents/kWh or \$20/MWh. For a 300 MW reduction in production per reactor the additional revenue OPG would receive to reduce nuclear production instead of hydroelectric production would be approximately \$6,000 per hour per reactor. The IESO should be able to estimate by simulation studies how many hours of nuclear curtailment are expected for each reactor over the next several years. That will help OPG determine which engineering solution is economical and how many reactors should be fitted with the engineering changes to allow those nuclear units to follow the load.

If the price spread mentioned above is not enough to motivate OPG to install sufficient load following capability to eliminate severe SBG, three other incentive alternatives are also available:

- Expose OPG's nuclear assets to the HOEP price as the IESO has suggested.
- Require OPG, by regulation or market rules, to provide load following capability.
- Pay OPG for foregone nuclear production similar to Bruce Power (this effectively establishes a value to the system for OPG's nuclear load following capability).

The latter approach would increase the global adjustment and electricity rates, but it would also increase OPG payments to the Ontario government if OPG distributes that additional income as dividend payments.

Dispatching Renewables and SBG Management

OSPE also wishes to point out that while OSPE supports the IESO's present plans to dispatch wind and solar generation to help manage SBG and operational transients, those plans should not be seen as a complete solution to managing SBG. From an environmental point of view we should be striving to improve nuclear plant operations so that the impact on the environment is minimized. Turning off wind and solar production so that nuclear plants can run at full power when that energy is not needed is not environmentally attractive due to the unnecessary additional quantities of nuclear waste that will be produced.

Adam Beck PGS Pumped Storage Assets: An Ancillary Service to Balance Supply and Demand

With respect to OPG's Adam Beck PGS pumped storage assets, OSPE believes storage assets should be an ancillary service to the grid to help balance supply and demand. The cost of maintaining storage capacity in good operating condition should be borne by the grid as a whole because the reduced SBG will benefit all ratepayers. Using HOEP to dispatch storage will result in non-optimum operation because HOEP in a given time interval does not respond to supply/demand imbalances in future time intervals. The decision to store in the current time interval is dependent on forecasts of variable generation (wind and solar) in future time intervals. Also storage operations by their nature reduce the HOEP price spread between charging and discharging periods. Consequently, if OPG's storage assets were exposed to the HOEP, then OPG will likely not receive sufficient income to fund reliable operation and maintenance of those storage assets.

To effectively dispatch storage facilities requires a level of supply/demand forecasting capability that currently resides at the IESO. The dispatching objective for storage should be to avoid extremes in supply/demand imbalance regardless of the prevailing HOEP. Because electricity is an inelastic commodity, extremes in supply/demand imbalances result in extremes in HOEP. Storage is an effective tool to mitigate those extremes provided the dispatching schedule is established from the SBG forecasts and not the HOEP. The Adam Beck PGS has an effective peak capacity of nearly 1,000 MW because the PGS discharge feeds the Adam Beck power plant complex resulting in a boost of nearly 6x in generating capacity relative to the nameplate generating capacity of the PGS itself. The IESO should ideally schedule the dispatching of both the PGS generation and the associated generation boost from the power plant. Similarly, the IESO should schedule the pump capacity during the charging cycle along with the reduction in power plant generation caused by the

pumping operation. Because of the complex water management co-ordination required at the Adam Beck complex, the actual operating control of the PGS and the power plant should remain with OPG.

We hope the comments above provide some additional options to incorporate incentives for OPG to more effectively dispatch its prescribed generation assets in accordance with the needs of the grid, ratepayers and the environment.

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