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Ontario Energy Board

REVIEW OF THE INTEGRATED POWER SYSTEM PLAN AND PROCUREMENT PROCESSES

PHASE I

COMMENTS OF
ENERGY PROBE RESEARCH FOUNDATION
("ENERGY PROBE")

December 13, 2007

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Background

The current review follows on previous work of the Ontario Energy Board (the Board or OEB) in developing a practical, effective process to review the Ontario Power Authority (OPA) Application for review and approval of the Integrated Power System Plan (IPSP). The previous work of the Board in consultation with stakeholders resulted in the issuance on December 26, 2007 of the *Report of the Board on the Review of, and Filing Guidelines Applicable to, the Ontario Power Authority's Integrated Power System Plan and Procurement Processes*.

The OPA filed its Application and supporting evidence on August 29, 2007.

On October 12, 2007, the Board issued a Letter of Direction to the OPA. Among other requirements, the Board on Page 2, at Item 4, directed the OPA as follows:

To prepare a proposed issues list, structured by reference to the findings the Board has to make, according to the legislation and Ministerial directions, for the review of the IPSP and the proposed procurement processes. The issues list, or accompanying documents, should be sufficiently detailed to allow parties to understand the scope of review that the Ontario Power Authority proposes for each issue.

Procedural Order No. 1, issued by the Board on December 3, 2007, confirmed that intervenors may make written submissions on the OPA's proposed issues list and that oral submissions with respect to the issues list will be heard by the Board during an Issues Proceeding commencing on January 14, 2007.

Comments of Energy Probe

Scope of OEB Review

The OPA's characterization of the scope of the Board's review is overly restrictive. In some

instances, the IPSP's proposals are clear and precise. In other instances, they are expressed in highly general terms and the actions proposed therein are subject to the further discretion of the OPA. This presentation raises the concern that the Minister's Directive may not be fully met.

The OPA is undoubtedly correct in drawing attention to the length and complexity of previous efforts to develop and review electricity system planning. However, it is up to the Board to satisfy itself that it has complied with its statutory mandate. In this regard, the Board is recognized as an expert body fully capable of determining whether the IPSP meets the Minister's Directive, even if it does not have the OPA's planning function and all of its expertise. Were this not true, then the requirement for OEB review would have little merit.

Accordingly, Energy Probe disagrees with the statement that "the Board's mandate does not include substituting its judgment on matters within the OPA's planning judgment." [Ex. A/Tab 2/Sch. 2/p. 7]. It is to be expected that the Board would choose to avoid such substitution of judgment in the normal course of review. However, the Board's mandate certainly includes the possibility that it may have to do so in order to fulfill its legislated mandate.

For these reasons, the Board must make such inquiries and draw such conclusions as it deems necessary in order to comply with its legislated mandate as found in s. 25.30(4) of the Electricity Act, 1998.

Degree of Deference

The IPSP introduces legal distinctions that purport to limit the inquiry of the Board in matters beyond the Board's "first order statutory powers". The suggestion appears to be that the Board's role is simply to prepare a list of items contained in the Minister's Directive and then to simply check off the listed items when the Board finds that the IPSP has not exceeded its authority [Ex. A/Tab 2/Sch. 2/p. 11].

Energy Probe's view is that the Board's role in reviewing the IPSP for compliance goes beyond merely determining whether OPA has exceeded its authority.

The Minister's Directive states that the IPSP should comply with the IPSP Regulation, as a result of which the IPSP Regulation has been brought within the Board's IPSP review mandate [Report of the Board, 12/27/06 at 3]. In this regard, the Board will have to examine closely whether the IPSP complies. The Board should not be satisfied with simply determining whether the IPSP has merely

“considered” those matters as the IPSP suggests, but rather has weighed and evaluated those matters as the Board itself has indicated.

In this regard, the OPA’s description of the consideration required by section 7 of paragraph 2(1) of the IPSP Regulation [Ex. A/Tab 2/Sch. 2/p. 12] is incomplete. The previous version of this regulation required that the IPSP “reflect” safety, environmental protection, and environmental sustainability. The Board now interprets the revised Regulation to require the OPA to “weigh and evaluate” these matters in developing the IPSP. [Report of the Board, 12/27/06 at 26-27]

It goes without saying that the Board is entitled to evaluate the OPA’s weighing and evaluating and to draw conclusions on whether the IPSP complies with the IPSP Regulation.

Does the IPSP “identify and develop innovative strategies to encourage market based responses and options for meeting overall system needs”?

Two sections of the IPSP Regulation require consideration be given to the role for competition in meeting system supply needs. According to paragraph 4 of s.2.(1) of the IPSP Regulation, the OPA shall

“identify and develop innovative strategies to encourage and facilitate competitive market-based responses and options for meeting overall system needs.”

The IPSP proposes to meet system requirements by procurement. However, paragraph 5 of s.2. (1) requires the OPA

“to identify measures that will reduce reliance on procurement under section 25.32 of the Act”.

The IPSP addresses both concerns at [F/2/1/1-4]. The Board should satisfy itself that the IPSP activities comply with these regulatory requirements. Several issues arise.

- (a) As presented in the IPSP, the OPA will award contracts to procure resources that will meet the projected energy requirements net of conservation. The IPSP does not address the risk-sharing in these contracts in the event of delays and/or non-performance. Will providers receive revenue guarantees from OPA?
- (b) While not entirely clear, it appears that OPA will purchase power under contracts with these entities and the OPA will recover its costs from consumers. It is not clear how the OPA will determine what it should pay for power from these entities or how these payments should be recovered from consumers. In particular, will the OPA simply pass on its procurement costs to consumers? If so, what are the incentives on OPA to minimize these costs? Will OPA follow the procedures for rate-setting established by the Board so as to ensure that excess returns to those entities are avoided?
- (c) The OPA prefers competitive bidding, and there is an indication that it will

mitigate entry barriers in procurement. It is not clear what measures the OPA will take in this regard.

- (d) To reduce reliance on OPA procurement, the OPA will determine whether contracts from other government agencies are available. This alternative does nothing to lay the groundwork for competition.
- (e) Is it desirable that the OPA is responsible for procuring both conservation resources and supply resources? This may be particularly problematic if OPA gives revenue guarantees to generating and transmission providers.
- (f) In regard to the extent that new nuclear facilities are to be procured, is it assumed that OPA will procure from OPG, and if so, is this consistent with competition?

Reference Energy and Demand Forecast

The resource requirements identified in the IPSP are based on forecasts of energy demand that in turn depend on indicators of expected economic activity, sectoral and population growth [Ex. D/Tab 1/Sch. 1/p.4]. For example, the Reference Forecast relies on a forecast annual GDP growth of between 2.4% and 2.8% between 2005 and 2025 drawn from the Ontario Ministry of Finance long-term outlook [Ex. D/Tab 1/Sch. 1/Att. 2/p.10].

The forecast, in particular, of economic growth in Ontario must contain or rely upon assumptions about energy supply, price and natural conservation, but these assumptions are not stated in the IPSP. To the extent that the IPSP seeks to provide energy infrastructure to support the economic forecast, its assumptions should accord with those in the Ontario Ministry of Finance outlook. If they do not, then the IPSP should clearly indicate such differences and the impact on the IPSP's forecasts of energy demand, peak demand, baseload demand and the implications for procurement.

In this regard, the IPSP Reference electricity price forecast adopts the "techno-vert" price scenario described in the National Energy Board's report entitled "Canada's Energy Future: Scenarios for Supply and Demand to 2025". It is noteworthy that the NEB forecast assumes light crude oil will cost US\$22/barrel in constant dollars in 2025 and that the price of natural gas reaches parity with oil.

It is not clear whether the Ontario outlook uses these assumptions in assessing long-term economic growth. If not, then its assumptions for energy demand growth and natural conservation may already be outdated, and possibly its forecast of expected economic growth. For example, the current oil price is close to US\$90/barrel.

Moreover, the value of the Canadian dollar has risen sharply since the Ontario Ministry completed its long term forecast, and this is likely to exacerbate the industrial shifts already under way.

The Board should satisfy itself that the Ontario Finance outlook and the assumptions therein are consistent with the IPSP assumptions that most strongly affect the IPSP energy demand forecast and procurement strategies.

Alternate Scenarios

The IPSP considers alternate scenarios for economic growth and the corresponding changes in energy demand [Ex. D/Tab 1/Sch. 1/p.25]. The high-growth scenario is drawn from the Ontario Finance Ministry long-term forecast that posits higher growth and production capability in Ontario combined with an employment shift from labour-based to knowledge-based industries.

It is surprising that the IPSP forecasts significantly larger energy and peak demand in this scenario than in its Reference Forecast, as it acknowledges that the continued evolution to a secondary manufacturing-based economy from primary resource-based industries would potentially lower demand [Ex. D/Tab 1/Sch. 1/p. 34].

The issue is whether higher economic growth necessarily entails greater electricity consumption. If it does not, due to the shifting industrial structure in Ontario, then it is quite possible that even the Reference Forecast overstates such consumption.

Renewable Supply

The Total Resource Cost evaluation of benefits of customer-based generation indicates an overall net benefit of \$120 million (in constant 2007\$). However, this includes a net cost of \$440 million for renewable resources. [Ex. D/Tab 4/Sch. 1/Att. 3/p. 35]

It appears that the renewable resources are to be justified on the basis of ancillary social benefits that are not included in the TRC analysis; for example, that biomass, solar and wind production will defer emissions from non-renewable production.

The Board should satisfy itself that the benefits of such externalities are large enough to justify the renewable resource component of proposed Conservation Resources in the IPSP.

Conservation Generally

The IPSP notes that energy demand growth is currently falling, from 1.3% per annum in 1995-2005 to 1.1% per annum over the forecast period. Peak demand grew at 1.4% annually for the period 1995 to 2005 and is forecast to grow at 1.2% over the forecast period [Ex. D/Tab 1/Sch. 1/p. 14].

It also notes that, in the Reference Forecast, household demand intensity is expected to decline continuously to 2027. Historical intensities had declined due to the shift away from electrical space and water heating, and the continued decline in the forecast period is due to the increased penetration of more efficient equipment [Ex. D/Tab 1/Sch. 1/p. 10]. “per GDP” demand intensity is also following this trend [Ex. D/Tab 1/Sch. 1/p. 15].

These declines must be due to “naturally occurring” conservation and to conservation programs already put in place. However, the IPSP does not rely on natural conservation to any extent nor does it analyze why such conservation has occurred; in particular, it has not determined the extent to which changes in relative price have led consumers to reduce consumption and/or substitute other fuels.

Indeed, the entire treatment of naturally occurring conservation and its place in the Reference Forecast is confusing:

- Q. How has the OPA determined a baseline against which to measure Conservation results?
- A. The OPA has established a goal of achieving Conservation that is incremental to that included in the reference forecast. This includes Conservation resulting from OPA programs as well as that which results from programs run by any other market actor (for example, the provincial or federal government).

The baseline used is what is defined as being naturally occurring Conservation. The naturally occurring Conservation that was used in the reference forecast was based on an overall assessment of efficiency improvements in the marketplace. This estimate does not provide the level of detail that would be required to translate the baseline into the specific programs that the OPA has chosen to undertake. Therefore, for the initial planning period, the OPA is using free riders as a proxy for the baseline. This means that the achievement of Conservation is not net of free riders but rather in excess of baseline assumptions regardless of how the actions were influenced.
[Ex. D/Tab 4/Sch. 1/p. 45]

Instead, it posits the need for Resource Acquisition (subsidies), Capability Building (training/education programs), and Market Transformation (to increase the use of energy-efficient technologies).

The OPA believes that the Minister's Directive has provided clear instruction that the conservation targets are to be met through the implementation and delivery of effective new conservation programs. The OPA understands that natural conservation will not play a role in the achievement of these goals [Ex. D/Tab 4/Sch. 1/Att. 2/p. 2].

The issues for the Board here are:

- (a) to clarify the role of naturally occurring conservation in the Reference Forecast. It is particularly important to determine whether the Ontario Government's economic forecasts, on which the Reference Forecast is based, include, or assume, naturally occurring conservation, as this affects the validity of the quantum of conservation and supply resources needed to support that economic growth forecast.
- (b) to satisfy itself on whether the Minister's Directive of January 13, 2006 directs that the Government's Conservation goals may be met only through the implementation and delivery of new conservation programs and excludes greater reliance on decentralized market forces, including market-based prices, to promote naturally occurring conservation, i.e. reduction in consumption and shifting to alternate fuels.

Nuclear

In line with the Minister's Directive, the IPSP plans for nuclear power to meet "baseload requirements", with an upper limit on installed in-service capacity of 14,000 MW.

(i) Definition of baseload

The IPSP defines baseload demand as that level of energy demand that exists at least 72% of the time. On this basis, it determines that a "gap" exists, and that nuclear power is the preferred resource having regard to cost and other attributes including reliability. [Ex. B/Tab 1/Sch. 1/p. 15] The definition of baseload energy requires detailed review, as alternate definitions may yield significant differences in the magnitude of the "gap".

The label "baseload" (and "baseload demand") has been misused, to suggest falsely that part of Ontario's electricity demand needs to be supplied with inflexible or non-dispatchable sources of electricity. Rather than having a need for baseload capacity, the grid has a maximum tolerance for such capacity, depending on the load duration curve, the predictability of changes in load, the availability of more flexible alternatives (supply and demand both), and the total cost of these alternatives.

Put another way, our grid could be completely reliable without a single MW of inflexible or non-dispatchable "baseload" capacity. On the other hand, a grid without enough flexible, dispatchable,

and reliable “peaking” capacity will be an unacceptably unreliable grid. The proper function of inflexible or non-dispatchable “baseload” capacity is to lower the total costs (financial and non-financial) of the grid, and to do so at an acceptable cost in reliability and flexibility to unforeseen events.

But the ISPS, e.g., at Ex. B/Tab 1/Sch. 1/p. 15, reverses this logical relationship, and suggests that there is a portion of demand that can only be met by of inflexible or non-dispatchable “baseload” capacity.

In that context, if there is a “gap” for nuclear capacity to fill, it must be a gap in meeting total demand, not in meeting “baseload demand”. And nuclear power logically must compete with all other supply and demand options in meeting that demand, not just other inflexible or non-dispatchable “baseload” options. And further, the “gap” for nuclear power to fill is limited both by the grid’s maximum tolerance for capacity with the unique characteristics of nuclear power, and by the 14,000 MW maximum in the Minister’s Directive.

Chief among those “unique characteristics” is a tendency to capricious and inconvenient lengthy outages, as the result of unique technological and regulatory pressures. For example, we believe that the failure of Ontario’s own 8 “A” reactors to generate any electricity for a period of over 6 years beginning on or before the beginning of 1998 was the largest such prolonged failure to generate of any generating technology in history. Similarly, the two newly refurbished reactors of Ontario’s Pickering-A station were 100% unavailable for the entirety of Ontario’s peak summer season of 2007, including the system peak hour and every other hour.

And finally, the very recent crisis over the safety regulation of Atomic Energy of Canada Limited’s “NRU” isotope-production reactor raises important questions about the sustainability and reliability of large reactors in a critical application like sustaining Ontario’s grid without adequate redundancy. How likely is it, under the IPSP proposal, that Ontario’s electrical grid would be unable to survive another foreseeable de-rating or shutdown of multiple reactors in response to safety concerns? Will the Canadian Nuclear Safety Commission, following its experience with the NRU situation, continue to permit large reactors to operate when external circumstances effectively prohibit the regulator from shutting down those reactors when they find safety compromised? And if so, is it acceptable to Ontario to put the nuclear-safety regulator in that compromised position?

(ii) Installed v. effective capacity

The IPSP distinguishes between the installed and effective capacity of various resources. For

committed wind, effective is only 20% of installed [Ex. D/Tab 3/Sch. 1/Table 6 p. 7]. For nuclear, the installed and effective capacities of existing and committed resources are the same, but no conversion factor for planned resources is given.

On the other hand, in-service capacity and performance for Canadian nuclear units [Ex. D/Tab 6/Sch. 1/p. 36] indicates average performance of 81.8% for 2005/2006. The IPSP uses this figure for planning purposes for those units in the forecast period, albeit the average lifetime performance of those units is only 76%.

The measure of reliability for nuclear resources carries important ramifications for the choice between nuclear and gas, the price of power and reliability of the grid.

Wind Power

The IPSP seems to assume a 20% factor to convert from total planned installed wind capacity to “effective capacity” [e.g., Ex. D/Tab 5/Sch. 1/p. 62]. How is this conversion factor calculated, or supported? Is it closely related to the historic availability of wind energy in Ontario coincident with the system peak?

Transmission Planning

The IPSP calls for significant investment in transmission facilities. To ensure that there is a social benefit to these investments, their costs should include the market value of the lands and facilities that will be acquired, as this value represents the value of those assets in other uses such as residential or recreation. If the IPSP has not included the value of those assets in other uses, then it has underestimated the true cost of investment in transmission facilities.

The Board should therefore ensure that the IPSP properly estimates the cost of transmission investments by including therein the value in alternate uses of the lands that will be acquired for transmission lines and corridors.

Energy Probe’s Proposed Additions to the Issues List

Issue #1: Board Scope and Deference (Ref: Ex. A/Tab 2/Sch. 2/p. 7)

Do the limits on the Board’s inquiry proposed in the IPSP prevent the Board from fulfilling its statutory mandate?

Issue #2: Competitive Market-Based Responses (Ref. Ex. A/Tab 2/Sch. 2/p. 11)

Does the IPSP comply with the requirement of IPSP Regulation to identify and develop innovative strategies to encourage and facilitate competitive market-based responses and options for meeting overall system needs?

Issue #3: Reducing Reliance on Procurement (Ref. Ex. D/Tab 4/Sch. 1/p.58)

Does the IPSP comply with the requirement of IPSP Regulation to identify measures to reduce reliance on procurement under the Act?

Issue #4: Payments to Stimulate Conservation (Ref. Ex. D/Tab 1/Sch. 1/Att. 2/p.10)

Are the proposed payments to consumers to stimulate conservation economically prudent and cost-effective in light of (i) the expected lower rates of economic growth (ii) the recognized decline in energy intensity at the household level and per-dollar of GDP and (iii) the evidence of naturally occurring conservation?

Issue #5: Naturally Occurring Conservation (Ref. Ex. D/Tab 1/Sch. 1/p. 10)

Does the IPSP give sufficient consideration to the role of naturally occurring conservation in developing its forecasts of energy demand?

Issue #6: Ontario Industrial Structure (Ref. Ex. D/Tab 1/Sch. 1/p. 34)

Are the IPSP's energy demand forecasts consistent with the expected changes in Ontario's industrial structure, particularly in light of the recent rise in the Canadian dollar?

Issue #7: Ontario Forecast (Ref. Ex. D/Tab 1/Sch. 1/Att. 2/p.10)

Are the explicit and implicit assumptions about energy demand and naturally occurring conservation in the Ontario Ministry's Long-Term Economic Outlook consistent with the IPSP's expectations and procurement strategies?

Issue #8: Cost of Renewables (Ref. Ex. D/Tab 4/Sch. 1/Att. 3/p. 35)

Are the avoided costs of the renewables component of customer generation justified in light of the negative \$440 million TRC analysis?

Issue #9: Baseload (Ref. Ex. B/Tab 1/Sch. 1/p. 15)

Does the IPSP present a proper definition of "baseload demand" and is the treatment of nuclear power and the consequential procurements sensitive to the IPSP's definition?

Issue #10: Nuclear (Ref. Ex. B/Tab 1/Sch. 1/p. 15)

Will the reliability and dispatchability of the remainder of the IPSP's electricity grid suffice to compensate for the unique characteristics of up to 14,000 MW of nuclear capacity? How is the need for reserve capacity affected by the choice of up to 14,000 MW of nuclear capacity rather than (e.g.) CCGT capacity, or coal-fired capacity, and what is the estimated cost of that additional reserve capacity?

Issue #11: Nuclear (Ref. Ex. B/Tab 1/Sch. 1/p. 15)

Is the in-service lifetime performance of Canadian nuclear plants a good indicator of future performance, and if so, is there sufficient reliability to proceed with planned nuclear development? Does the IPSP create a situation where the continued operation of the Ontario grid relies critically on reliable high-capacity performance by Ontario's planned nuclear stations? And if so, is that reliance acceptable to Ontario, and

will it be acceptable to Canada's nuclear-safety regulator? What is the estimated additional cost of providing enough reserve capacity to permit the grid to survive a CANDU shutdown?

Issue #12: Nuclear (Ref: Ex. B/Tab 1/Sch. 1/p. 15)

Does the IPSP provide any assurances against future "stranded" nuclear costs? E.g., does the IPSP's forecast cost of gas-fired power form an effective price cap, above which the OPA will not go in pursuing nuclear capacity? How does the IPSP plan to make tradeoffs between estimated nuclear costs and the risks of nuclear cost overruns?

Issue #13: Wind (Ref: Ex. D/Tab 5/Sch. 1/p. 62)

How is the IPSP's 20% conversion factor -- to convert from total installed wind capacity to "effective capacity" [e.g.,] calculated, or supported? How does it compare to the historic availability of wind energy in Ontario at the time of the system peak? What are the consequences of an error in this term?

Issue #14: Transmission (Ref. Ex. E/Tab 1/Sch. 1)

Do the proposed investments in transmission reflect the true social cost of the lands and facilities that will be acquired?

Respectfully submitted at Toronto, Ontario this 13th day of December, 2007.

Energy Probe Research Foundation