



Pembina Institute Comments on OPA Discussion Paper 4: Supply Resources

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General Comments

The paper makes reference to the screening of resources in terms of technological and commercial viability, reliability, cost-effectiveness, flexibility and robustness, environmental performance and social acceptance. However, no definitions of these criteria are provided, and no systemic evaluation of the available supply resources against these criteria is provided. There is, for example, no discussion of the factors considered in the determination of the LUEC of supply resources. Externalized environmental costs seem to be excluded from these calculations. We note that the approach to evaluation employed in the December 2005 Supply Mix Advice report was subject to widespread and substantial criticism.

Specific Comments

3.2. Imports

- The paper needs much more thorough analysis of potential for hydro based imports, both in terms of integration of intermittent renewables and baseload supply.

3.4. Wind

- The assessment of wind potential does not appear to consider off-shore sites
- We note that the wind capacity values, based on more recent research, are higher than those assumed in the Supply Mix Report.
- Re: low load/wind issues – implication here seems to be to increase the use of flexible generation options, as opposed to less flexible options (particularly where they will continue to require fuel and generate wastes even when their output is not required).

3.5. Biomass

- The discussion of forestry and related industry biomass requires a much more thorough examination of the ecosystem health and sustainability implications of the removal of large amounts tree harvest residues and other materials from the forest.

- The overall net energy consumption and output and other environmental impacts of dedicated forest plantation and agricultural crops for energy production need to be examined carefully. These types of undertakings can turn out to be substantial net energy consumers, depending on local conditions and the crops grown.
- The paper needs to clarify definition of MSW biomass. Direct combustion, gasification and pyrolysis of MSW should be excluded from this definition. See the discussion of this issue on the Pembina Institute's submission on Discussion Paper 7.

4.1. Nuclear Generation

- The Pembina Institute's analysis of the risks, impacts and sustainability of nuclear power as a electricity supply option is provided in the report *Nuclear Power in Canada: An Examination of Risks, Impacts and Sustainability*. A copy of this report is enclosed with this submission. Among other issues the Pembina Institute believes the OPA paper:
 - Downplays the underlying structural issues related to uranium supply and price.
 - Fails to note that the NWMO's recommendations on waste nuclear fuel management have yet to be accepted by the federal government, and that no long-term management facilities have been identified, and no aspects of the proposed strategy have been subject to environmental assessment
 - Fails to recognize the extent to which the management of waste nuclear fuel, which will need to be secured for 1 million years for safety, environmental, health and security reasons. This implies the transfer of significant risks and costs to future generations in support of current electricity consumption. This is not an acceptable option in light of the sustainability principles articulated in discussion paper 6.
 - Fails to recognize the liabilities assumed directly and indirectly by Ontario taxpayers and ratepayers via the Ontario Nuclear Funds Agreement, Ontario Electricity Finance Corporation, and other mechanisms.
- As noted in the Pembina Institute's submission on Discussion Paper 7, the Institute believes that the OPA has treated the Supply Mix Directive cap of 14,000MW nuclear capacity as a target to be achieved rather than a maximum, where lower levels of capacity are acceptable if alternatives are available.
- The Pembina Institute does not believe that the screening level environmental assessments under the *Canadian Environmental Assessment Act* of nuclear refurbishment projects to date have provided a meaningful examination of the risks, impacts and alternatives to these projects. The Institute notes that screening level assessments are the minimum level of assessment available under the CEEA,

4.2 Gas and CHP

- As discussion of projected natural gas prices is provided in the Pembina Institute report *A Comparison of Combustion Technologies for Electricity Generation: 2006 Update*, Published in November 2006, and enclosed with this submission.
- The Pembina Institute notes that the available projections of future natural gas prices are substantially lower than those used by the OPA for the purpose of the analysis provided in its supply mix advice.
- The Pembina Institute notes that the OPA's estimates of the potential for CHP in Ontario remains well below the technical and economic potential previously identified by the Ministry of Energy (16,000MW) and the Pembina Institute (6700MW)
- A much more systemic analysis of the impact of recent changes in land-use planning policy for district energy systems and more general improvements in community and building energy efficiency should be provided, and incorporated into the IPSP.

4.3. Storage Technologies

- Discussion of these technologies is useful, but no discussion is provided of the implications of these technologies for overall system design (e.g. levels of intermittent renewables that can be integrated into the overall system).
- The discussion of thermal energy storage recognizes potential for large scale installations, but again provides no discussion of the implications of this for the overall system.

5.1 Distributed generation technologies.

- Classification of solar PV as a 'promising' technology is surprising, given the level of commercial adoption around the world.
- The discussion of solar:
 - Fails to discuss potential role as a summer peaking technology.
 - Fails to discuss potential for solar thermal.
- Paper acknowledges advantages of distributed generation and likelihood costs will fall over time, but provides no overall analysis of the implications of these developments. It would seem to suggest that overall proposed installed capacity of 1000MW over the life of the ISPS is an extremely low target.

5.2. Gasification

- A detailed discussion of IGCC technology and its performance and commercialization status is provided in the Pembina Institute report *A Comparison of Combustion Technologies for Electricity Generation: 2006 Update*, published in November 2006, and attached to this submission.