

From: Ron Tolmie [REDACTED]
Sent: November-21-13 11:20 PM
To: BoardSec
Subject: EB-2013-0321

Ron Tolmie
[REDACTED]

OEB Board Secretary:

Letter of Comment

Re: OPG Application **EB-2013-0321**

The Board should direct OPG to rely on more on storage rather than on generation to meet peak demands for power in Ontario. The peak power demand is more than double the minimum power demand so if storage is utilized the required generation capacity could be reduced by approximately 10,000 MW. That would make it possible for Ontario to phase out all of its peaking power generation stations as the storage sites are progressively built, and also avoid the expense of building or refurbishing nuclear power stations for several decades to come. Storage also makes variable energy sources like wind turbines much more practical.

The cost per MW of power or per PJ of energy for storage is much less than those costs for the OPG systems that produce the same amount of generation, and if the storage sites are distributed in proximity to the electricity consumers there will be no need for building a distribution grid that needs to handle vast quantities of electricity flowing between the highly variable demands of urban sites and the variable generation facilities. The potential capital cost reductions would be in the tens of billions of dollars and the costs per kWh of delivered energy would also decline.

By eliminating the need for peaking power stations this approach would also eliminate the GHG that they emit. Although the Energy Ministry prominently claims that its switch from coal to natural gas has reduced the GHG emissions in North America I would suggest that such a claim is not true. When it is burned natural gas produces only 57% as much CO₂ as coal for a given energy output but the methane in the natural gas has a GWP factor of 72 (IPCC, 20 yr. averaging period) so if even a tiny amount of the natural gas escapes at any stage of its progression from the ground to the consumer it will cancel out the combustion advantage of natural gas. That is particularly a problem for shale gas which will soon become the primary source of natural gas for Ontario.

This is a particularly important issue because Ontario uses much larger amounts of natural gas for heating buildings than for power generation but the OEB (which regulates both gas and power) has failed to recognize that the two are closely related. Storage systems can act like giant batteries that collect large amounts of electricity, store it until it is needed, and then return that energy to meet the peak demands. One way of doing that is to use electrical power to boost the

exergy of a heat store, starting with heat from readily available heat sources like the heat in the air around us. That heat can be stored from day to night or from summer to winter, and when it is recovered the energy is utilized in the form of heat rather than electricity. The result is that the "battery" accumulates electricity when it is plentiful and cheap, and then returns that energy to the grid in the form of electric demand reduction. A more comprehensive explanation can be found in the November issue of <http://sustainability-journal.ca> in the link "Exergy Storage in the Ground" and the other references in the Journal.

Organizations like OPG and the OPA are totally focused on electric power generation to the exclusion of the larger market for thermal energy. Since the OEB deals with both gas and power it should take the initiative to integrate the systems that provide power and thermal energy. A single exergy store serves both purposes, which dovetail together very nicely.

Ron Tolmie
Editor, Sustainability-Journal.ca