

Data on CANDU Operating Cost

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As Ontario debates its electricity future, the cost disadvantages of existing CANDU reactors are rarely recognized. Ontario government officials seem to be particularly prone to blanket statements about nuclear cost effectiveness.

An Ontario government official recently told a nuclear industry audience:

We hear a lot about the cost of nuclear. People say it is too expensive when compared with other types of generation. Yes, it does have high construction and start-up costs, but these are offset by its low operating costs over the 60-year life of a plant.¹

CANDU reactors have proven to be generally more costly to build than light water reactors (although there are exceptions). This disadvantage is due to their greater complexity, their unique reliance on costly heavy water, and their lower power density relative to pressurized water reactors.

Here are a few pieces of data on nuclear cost in Ontario drawn from original documents illustrating how uncompetitive CANDU is from the perspective of operating cost.

Canada's most modern and productive nuclear station is Darlington. Darlington's operating cost per unit of output in 2007 was \$29/MWh² (note that all cost figures are in Canadian dollars). The median comparable operating cost benchmark for US reactors directly comparable to Darlington is \$23/MWh.³ The 3rd quartile cut-off for Darlington comparators in the US was \$28.3/MWh in 2007. This means that in 2007, our best station was ranked in the 4th quartile of the US fleet.⁴

¹ JoAnne Butler, Vice-President, Electricity Resources, Ontario Power Authority, presentation to The Organization of CANDU Industries, Annual Nuclear Symposium/Suppliers Day – Eastern Region Event, Ajax, Ontario, May 26, 2009.

² http://www.opg.com/about/reg/filings/hearings/files1/J%20-%20Undertakings/J4.6_J4.7_J4.8.pdf

³ <http://www.opg.com/about/reg/filings/hearings/files/Exhibit%20A%20-%20Administrative%20Documents%20-%20Updated%20May%209%202008/Ex%20A1%20Tab%2004%20Sch%203%20-%20Overview%20of%20Nuclear%20Facilities.pdf>, See Chart 3 on page 17 of 28 but note that the results quoted for OPG reactors is reflective of forecasted results, not actual results.

⁴ <http://www.opg.com/about/reg/filings/hearings/files/Exhibit%20L%20-%20Interrogatory%20Responses%20-%20Updated%20May%2014%202008/Exhibit%20L%20Tab%2002%20-%20Association%20of%20Major%20Power%20Consumers%20-%2042%20MB.pdf>, See page 241/262.

Operating costs (not including incremental capital additions) for Pickering A, Pickering B and Darlington averaged over the period 2005-2007 were \$106, \$54 and \$28 per MWh respectively⁵, putting the inefficiency of OPG's nuclear operations off-the-charts relative to US comparators.

The reference in footnote #2 provides an explanation from OPG as to the high level of its operating costs. At page 21/30, OPG lists the following factors: costly heavy water, more radioactive working environment, costs associated with common containment, extra complexity and staffing associated with on-power refueling, pressure tube inspection, and larger equipment inventory. Given the long history of claims that on-power refueling was a unique advantage of CANDU, the admission that this design issue is a net detriment to cost effectiveness is particularly significant.

⁵ (Ibid. page 128/262)