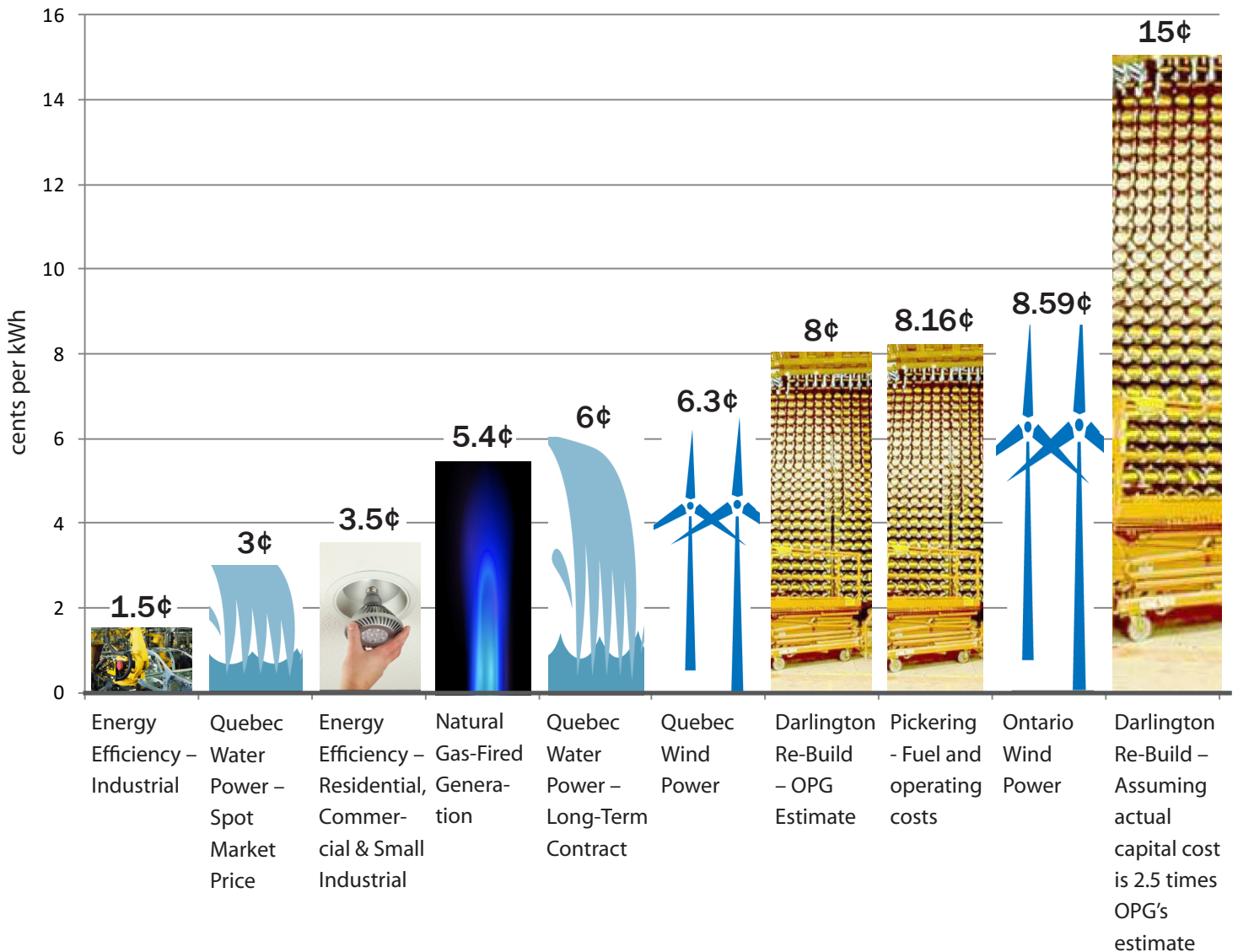


Ontario's Electricity Options: A Cost Comparison

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Notes

Energy efficiency – industrial: The Independent Electricity System Operator (IESO) has a \$500 million budget to reduce the electricity consumption of Ontario's large volume industrial customers by 1.7 billion kWh per year in 2020. The IESO assumes that these savings will persist for 20 years. Therefore the average cost per kWh saved is 1.5 cents. Email from Terry Young, Vice President, IESO to Jack Gibbons, Ontario Clean Air Alliance, (July 13, 2015).

Quebec water power – spot market price: According to the Quebec Energy Commission, Hydro-Quebec can only obtain high prices for its exports during the 300 peak demand hours of each year. And, as a result of transmission constraints, Quebec can only export 10 billion kWh per year during high price periods. As a consequence, approximately two-thirds of Hydro Quebec's electricity exports are sold at an average price of only 3 cents per kWh. According to the Quebec Energy Commission, Hydro-Quebec's low-price electricity exports will grow by 50% between 2014 and 2022 from 20.1 billion kWh to 31.1 billion kWh per year. Commission sur les enjeux energetiques du Quebec, *Maitriser Notre Avenir Energetique*, (2 fevrier 2014), pages 176 – 183.

Energy efficiency – residential, commercial & small industrial: Ontario Power Authority, *Conservation First Framework Update: Presentation to SAC*, (June 24, 2014), pages 7 & 8.

Natural Gas-Fired Generation: This is the IESO's forecast of the cost of gas-fired generation in 2020 assuming the gas plants have a 95% annual capacity utilization rate and the commodity cost of gas is \$5.50/MMBtu (2014\$) at the Dawn Hub near Sarnia. Ontario Power Authority, *Conservation & Demand Management Energy Efficiency Cost Effectiveness Guide*, (October 2014), pages 57 & 58; and email from Terry Young, Vice President, IESO to Jack Gibbons, Ontario Clean Air Alliance, (October 20, 2015).

Quebec water power – long term contract: Assuming that the long-term import price is the mid-point between the price of spot market sales (3 cents per kWh) and Ontario Power Generation's (OPG's) 2014 "high-confidence" estimate of the cost of the Darlington Re-Build Project (8.9 cents per kWh). In 2010, Hydro-Quebec signed a 26-year export contract with Vermont with an initial price of 5.8 cents per kWh. Ontario Clean Air Alliance Research, *Ontario's Long-Term Energy Plan: A One Year Review*, (November 10, 2014); Hydro Quebec, *Press Release*, "Vermont and Quebec reach new energy agreement", (August 12, 2010); and State of Vermont, Public Service Board Docket No. 7670, *Order entered: 4/15/2011*, page 11.

Quebec Wind power: In 2014 Hydro Quebec used a competitive procurement process to contract for wind power at an average generation cost of 6.3 cents per kWh. Hydro Quebec, *Press Release*, "Calls for tenders for the purchase of 450 MW of wind power: Hydro-Quebec Distribution accepts 3 bids totalling 446.4 MW", (December 16, 2014).

Darlington Re-Build – OPG Estimate: OPG, News, "OPG Ready To Deliver Refurbishment of Darlington Nuclear Station", (January 11, 2016).

Pickering Nuclear Station's fuel and operating costs in 2014: See Ontario Energy Board Docket No. EB-2013-0321, Undertaking JT1.14 (Refiled: 2014-06-03). This amount does not include debt retirement charges stemming from cost overruns on initial plant construction or Pickering Units 1 and 4 Re-Start Projects.

Ontario Wind: IESO Media Release. "IESO Announces Results of Competitive Bids for Large Renewable Projects," (March 10, 2016).

Darlington Re-Build: Assuming actual capital cost is 2.5 times OPG's Estimate: In 2014 OPG told the Ontario Energy Board that if the actual capital cost of the Darlington Re-Build is 2.5 times greater than its "high-confidence" estimate, its cost of generating electricity would rise by 87%. We have applied the same escalation rate to OPG's new cost estimate. That is, 8 cents per kWh x 1.87 = 15 cents per kWh. Ontario Clean Air Alliance Research, *Ontario's Long-Term Energy Plan: A One Year Review*, (November 10, 2014), pages 1 and 3.

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