A New GTA Nuclear Reactor vs Wind and Solar

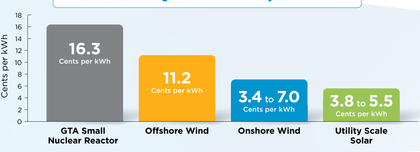
Ontario Power Generation is planning to build a small modular nuclear reactor (SMR) at the Darlington Nuclear Station near Oshawa.[1]

According to the Canadian Small Modular Reactor Roadmap Steering Committee's forecast, **an SMR will produce electricity at a cost of 16.3 cents per kilowatt-hour (kWh)**. The Committee hopes that the first commercial SMR will be in operation by 2030.[2]

On the other hand, according to Lazard, the world's largest independent investment bank, **solar and onshore wind can now supply electricity at a cost of 3.4 to 7.0 cents per kWh**.[3]

This means the forecast **cost of power from an SMR is two to almost five times greater than the cost of power from solar and onshore wind**.

Electricity Cost Comparison



Federal Nuclear Subsidies

The Government of Canada wants to use **your tax dollars** to subsidize the development of small nuclear reactors **despite the fact that they are the highest cost and slowest option** to reduce our greenhouse pollution.

Ontario has a large potential supply of wind and solar energy.

For example, a report prepared for the Government of Ontario identified 64 potential offshore wind power sites in the Great Lakes that could produce 111.5 billion kWh of electricity per year.[4] **This is equivalent to 82% of Ontario's total electricity consumption in 2019.**[5]

Quebec's Green Battery

However, since the wind doesn't always blow and the sun doesn't always shine, these **intermittent renewable energy systems must be combined with storage systems** if they are to displace nuclear generation during every hour of the year.

The lowest cost storage option for Ontario's electricity system is Hydro Quebec's hydro-electric reservoirs.[6] Specifically, when our wind power production is above average, our surplus wind energy can be exported to Quebec to keep the lights on in Montreal, and Hydro Quebec can store more water in its reservoirs. Conversely, when our wind power generation is below average, Hydro Quebec can use the extra water in its reservoirs to produce electricity for export back to Ontario. **In short, by integrating our wind and solar generation with Hydro Quebec's reservoirs we can convert our intermittent wind and solar into a firm 24/7 source of baseload electricity supply for Ontario.**

With our existing transmission connections, Hydro Quebec's reservoirs can provide Ontario with approximately 2,000 megawatts (MW) of storage for our wind and solar generation.[7] By building a new 20 km transmission line through an existing transmission corridor in Ottawa, we could enable Quebec's reservoirs to provide us with an **additional 2,000 MW** of storage for solar and wind generation at a construction cost of approximately $80 million.[8]

Spent Nuclear Fuel

The proposed new Greater Toronto Area (GTA) nuclear reactor would produce highly toxic radioactive spent nuclear fuel which would remain dangerous for hundreds of thousands of years. Despite decades of searching, Canada still has not even identified a location for a long-term high-level radioactive waste site. In the interim, **the proposed reactor's wastes would have to be stored in the GTA at the Darlington site on the shore of Lake Ontario.**

Conclusion

According to the International Energy Agency, renewables will account for 95% of the growth in global power capacity during the next five years.[9] **It doesn't make sense to build a new nuclear reactor in the GTA given that wind and solar energy can keep our lights on at less than half the cost without producing toxic radioactive wastes.**

What You Can Do

Please contact Canada's Minister of Finance, Chrystia Freeland, and tell her that you want the Government of Canada to invest in energy conservation and renewables, not small nuclear reactors.

Click here to send a message to Chrystia Freeland

References

1 Ontario Power Generation, *Media Releases*, "OPG resumes planning activities for Darlington New Nuclear" (November 13, 2020).

2 Canadian Small Modular Reactor Roadmap Steering Committee (2018), *A Call to Action: A Canadian Roadmap for Small Modular Reactors*, pages 35 and 54.

3 According to Lazard, the cost of utility scale solar PV is 2.9 to 4.2 cents per kWh (US$); the cost of onshore wind is 2.6 to 5.4 cents per kWh (US$); and the cost of offshore wind is 8.6 cents per kWh (US$). We have converted these costs to Canadian dollars by multiplying them by 1.3. Lazard, *Lazard's Levelized Cost of Energy Analysis – Version 14.0*, (October 2020) page 2.

4 Helimax Energy Inc., *Analysis of Future Offshore Wind Farm Development in Ontario*, (April 2008), pages iii, 18 & 19.

5 In 2019 Ontario consumed 135.1 billion kWh. IESO, *News Release*, "2019 Year in Review", (January 30, 2020).

6 Emil Dimanchev, Joshua Hodge and John Parsons, *Two-Way Trade in Green Electrons: Deep Decarbonization of the Northeastern U.S. and the Role of Canadian Hydropower*, MIT Center for Energy and Environmental Policy Research; http://ceepr.mit.edu/files/papers/2020-003-brief.pdf

7 Power Advisory LLC, *Ontario Wholesale Electricity Market Price Forecast: For the Period November 1, 2020 through April 30, 2022*, (October 13, 2020), page 8.

8 Ontario's Independent Electricity System Operator (IESO) analysed three new transmission options to allow us to import an additional 2,000 MW of electricity from Quebec. According to the IESO the 350 km transmission line option could cost up to $1.4 billion. We have estimated the cost of the 20 km option assuming that its cost per km would be the same as the 350 km option. IESO, *Ontario-Quebec Interconnection Capability: A Technical Review*, (May 2017), pages 24 to 27.

9 International Energy Agency, *Renewables 2020: Analysis and forecast to 2025*, page 8.

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