

## **Submission to Darlington Joint Review Panel Public Hearing**

**From:** Tim Weis, director of renewable and energy efficiency policy, The Pembina Institute  
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Thank you for this opportunity to present to you today.

My name is Tim Weis and I am the director of RE/RE for the Pembina Institute. I have a Bachelors of Mechanical Eng'g from the U of Waterloo, and a Masters' of Mech Eng from the University of Alberta. I am a professionally registered Engineer in the province of Alberta.

The Pembina Institute was founded over 25 years ago, after one of Canada's worst industrial accidents, where a sour gas well exploded just outside of Drayton Valley, Alberta.

Since then, the Institute has become one of Canada's largest energy think-tanks focusing sustainable energy solutions. We have over 55 employees ranging from BC, to Ontario and we focus on oil and gas development, climate change, renewable energy and sustainable transportation.

In spite of the gains that have made in improving the safety oil and gas development, it is worth noting that just last month there was a significant sour gas well explosion that injured 12 workers. While not as significant as the Lodgepole blowout that led to the founding of the Pembina Institute, it is an important reminder that industrial accidents still happen even in very well established and highly regulated industries.

My focus with the Institute is on sustainable energy development, in particularly renewable energy and energy efficiency technology, and that is why I'm testifying today. The Pembina Institute has also published numerous publicly available reports examining how Ontario could replace its nuclear fleet with long-term sustainable electricity choices, and has intervened as a member of the Green Energy Coalition at the Ontario Energy Board.

I apologize for not being able to be present in person in my home province of Ontario, but I live and work in Edmonton and was not able to travel this week. I do appreciate the opportunity to speak today however as the issues being discussed are not only of national importance, but there is also significant discussions of nuclear development in the prairies.

In fact Alberta and Saskatchewan recently conducted nuclear enquiries in their respective provinces. Alberta decided that they would not block nuclear development in the free market here, but insisted no provincial tax payer dollars be put towards such development. In Saskatchewan, one of the key

recommendations resulting from the nuclear consultations was the public desire to examine alternatives, notably renewable energy.

And that is what I'm here to discuss today – the need to examine alternatives to nuclear redevelopment. While I am particularly interested in examining the renewable energy alternatives in Ontario, a Federal environmental assessment needs to consider realistically viable options as part of a precautionary approach.

Our submission to this panel pre-dates the recently released Long-Term Energy Plan in Ontario, although it is worth noting that a full Integrated Power System Plan has not been developed or adopted based on the long term energy plan. Nonetheless, the fact remains that Ontario has an abundance of renewable energy options that are capable of replacing the generation capacity of the proposal reactors.

Our submission outlines one possible portfolio to meet these needs, although it is certainly not the only one that is available. This particular portfolio is a mix of onshore wind, offshore wind, solar photovoltaic, hydro power, biomass, biogas, landfill gas, combined heat and power as well as additional conservation and demand management, all of which is above and beyond the current business as usual.

The question that is always raised when such a switch is proposed is the question of reliability of supply. To address this I will start by quoting the Chair of the Federal Energy Regulatory Commission in the United States, John Wellinghoff, who stated on April 22, 2009 at the U.S. Energy Association forum:

“If you can shape your renewables, you don't need fossil fuel or nuclear plants to run all the time. And, in fact, most plants running all the time in your system are an impediment because they're very inflexible. You can't ramp up and ramp down a nuclear plant. And if you have instead the ability to ramp up and ramp down loads in ways that can shape the entire system, then the old concept of baseload becomes an anachronism.”

While Mr. Wellinghoff's statement is predicated on an improved ability to manage load and dispatch renewable energy, these technologies are already technically possible given advancements in smart grids and power storage.

Furthermore, it is always important to remind ourselves of the inherent redundancy that any electrical system requires. Ontario's power system equally needs to be able to handle the non-availability of the proposed nuclear plant when it is down for scheduled maintenance or due to unforeseen events, either natural or due to mechanical or electrical failures.

Building a suite of alternatives has several key advantages to a centralized nuclear power plant as well. Firstly it distributes the generation capacity, improving the redundancy of the overall system and reducing its susceptibility to losing massive single sources of power.

A suite of alternatives also has the advantage of being built incrementally over the next decade, while a commitment to a single point source such as the nuclear reactors are more of an all or nothing approach.

That is to say, no energy will be available from a new nuclear plant until approximately 10 years from now at which point it will all be online at once.

Whereas a portfolio of alternatives can be built in much smaller increments starting almost immediately and ramping up over that same period of time. An incremental approach to construction means that the pace of development can be adjusted as new information about electrical demand become available over the next decade.

It is not hard not to believe that there are many things we do not know about what Ontario's electricity demand will look like a decade from now.

As for whether the resource exists, Germany, which is a country with just over a 1/3 of the land area as Ontario has already installed over 27,000 MW of wind energy capacity and over 15,000 MW of solar PVs. And so the capacity for what would meet both the requirements in the long-term energy plan as well as the portfolio of alternatives discussed here is already superseded and operating in a country significantly smaller than Ontario.

So the question is not whether adequate resources exist, because it is clear they do, but is such a portfolio compatible with Ontario's electricity needs. The same question could also be asked in reverse – is the output of a nuclear power plant compatible with Ontario's needs? There has never been a justification for why nuclear capacity needs to be approximately 50% in Ontario.

There are no technical reasons why a 50% level should be chosen, and in fact as we have seen in recent years, the major differences between demand peaks and demand lows have put Ontario in a situation of baseload surplus. This situation could be exasperated by additional must run technologies such as wind power, as nuclear plants have little to no ability to load follow. How the 50% nuclear number has been derived has never been made public

Finally, the question of long-term sustainability needs to be considered by this panel. Renewable energy has experienced market growth rates on the order of 30% over the past 2 decades. But a massive global investment boom has really begun in the past 5 years, with 2008, 2009 and 2010 being the first years that renewable electricity investment outpaced investment in traditional

electricity sources globally. The United States and China have now both surpassing Germany as the global leaders in wind energy in particular as countries, states and provinces look to higher and higher proportions of integration of renewable energy into their electric systems. This is relevant as information as recent as 5 years ago about the state of renewable energy technology would be considered significantly out of date. Ontario laudably has one of North America's most aggressive renewable energy development strategies, but there is limited capacity on its system and choices need to be made between competing options.

Developing new nuclear capacity may not only impede the growth of truly renewable energy sources by making their integration into the grid more difficult, but also locks-in significant capacity on the grid putting a ceiling on long-term renewable energy development for decades to come, thereby in fact limiting or at least slowing a transition to long-term sustainability.

In summary, it is clear there are viable alternatives to the proposed Darlington station that have not been adequately considered. Furthermore, there is no technical justification for why 50 per cent of Ontario's supply needs to remain nuclear indefinitely, which has thus far constituted the need for this project.

The Pembina Institute would submit that the environmental assessment is therefore incomplete without consideration of viable alternatives.