



Oral presentation

**Written submission from
North American Young
Generation in Nuclear**

In the Matter of the

Ontario Power Generation Inc.

Application for a licence to construct one
BWRX-300 reactor at the Darlington New
Nuclear Project Site (DNNP)

**Commission Public Hearing
Part-2**

January 8, 2024

Exposé oral

**Mémoire de la North American
Young Generation in Nuclear**

À l'égard d'

Ontario Power Generation Inc.

Demande visant à construire 1 réacteur
BWRX-300 sur le site du projet de nouvelle
centrale nucléaire de Darlington (PNCND)

**Audience publique de la Commission
Partie-2**

8 janvier 2024



✉ info@naygn.org

📍 PO Box 32642
Charlotte, NC 28232

🌐 NAYGN.ORG

NAYGN Oral Intervention

**ONTARIO POWER GENERATION INC.'S
APPLICATION FOR A LICENCE TO
CONSTRUCT ONE BWRX-300 REACTOR
FOR ITS DARLINGTON NEW NUCLEAR
PROJECT**

JANUARY 2025

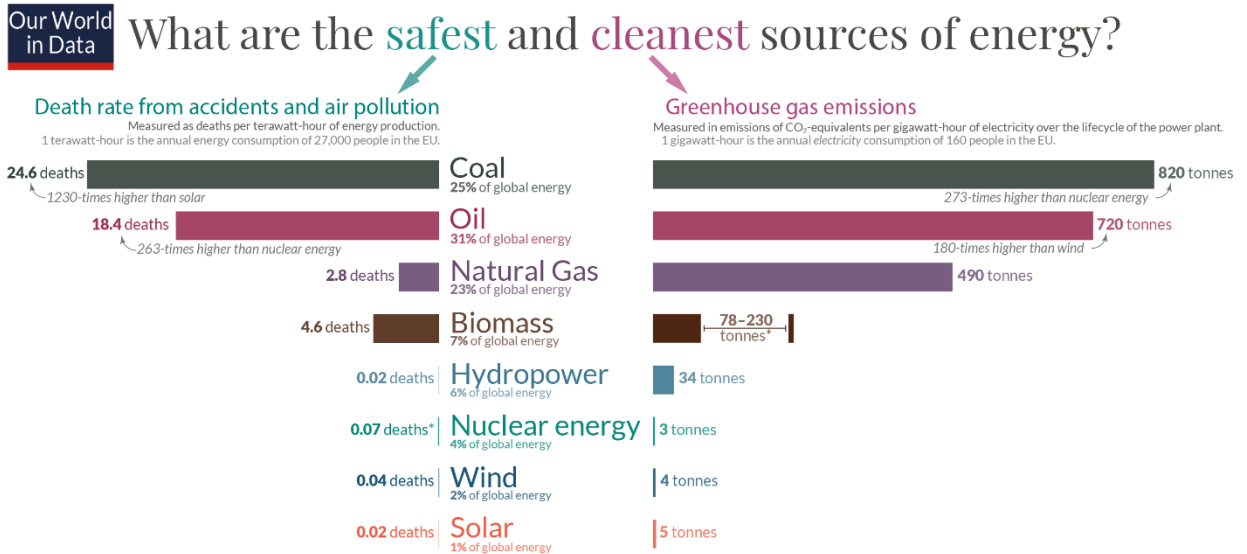
MATTHEW MAIRINGER – NAYGN PAST PRESIDENT

I would like to start by thanking the Canadian Nuclear Safety Commission (CNSC) for providing an opportunity to intervene on Ontario Power Generation Inc.'s Licence to Construct Application for one BWRX-300 Reactor for its Darlington New Nuclear Project. I have over eleven years of experience working for Ontario Power Generation at both the Pickering and Darlington nuclear sites. I have worked in Project Controls, Minor Modifications, Reactor Safety, Stakeholder Relations, Performance Engineering, Business Development, and Nuclear Sustainability Services. Currently I am a senior technical engineer at Ontario Power Generation. I earned my Bachelor of Engineering degree in Nuclear Engineering and Graduate Diploma in Nuclear Technology from the University of Ontario Institute of Technology and am both a Professional Engineer in the province of Ontario and a Project Management Professional. I am a Bowmanville resident and live less than 10km away from the Darlington site.

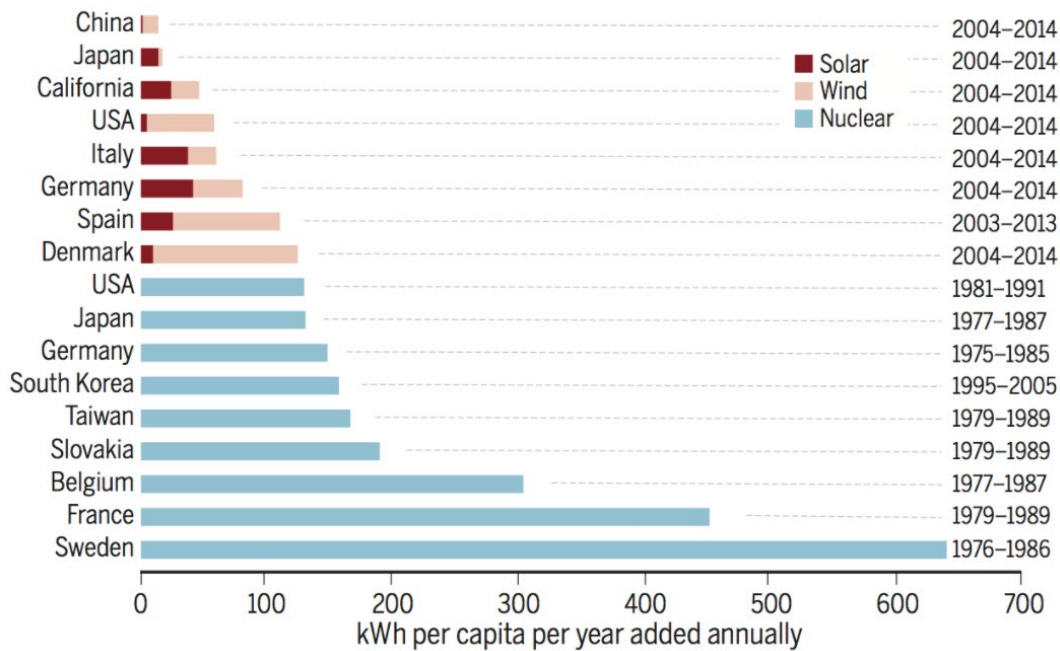
I am here representing North American Young Generation in Nuclear (NAYGN) as the NAYGN continental Past President. [NAYGN](#) is a non-profit organization of young professionals and students passionate about the nuclear industry and is focused on professional development, public information, knowledge transfer & retention, and networking. There are currently over 150 chapters across North America with 24 chapters in Canada.

I want to start with a broad perspective - fossil fuel air pollution causes almost [1 in 5 deaths globally each year](#) and already the global average atmospheric carbon dioxide is over 420 parts per million. This is the current situation; this is the reality we have. As global citizens, we need to rapidly adopt technologies that help us to reach our net zero targets. Ontario, thankfully, already has one of the cleanest grids on the planet with ~60% nuclear in combination with hydroelectricity and other clean sources. With Canada's Net-Zero Emissions Accountability Act combined with the push for more electrification (such as transportation), we will need new, clean, reliable baseload power more than ever. I am excited for the DNNP for several reasons:

- As an Engineer I love ‘optimization’. Life is full of compromises and risk, so finding the right balance is key. When accounting for the deaths from accidents and air pollution (and therefore the “safety”) and combining the greenhouse gas emissions by source, nuclear is a clear winner.



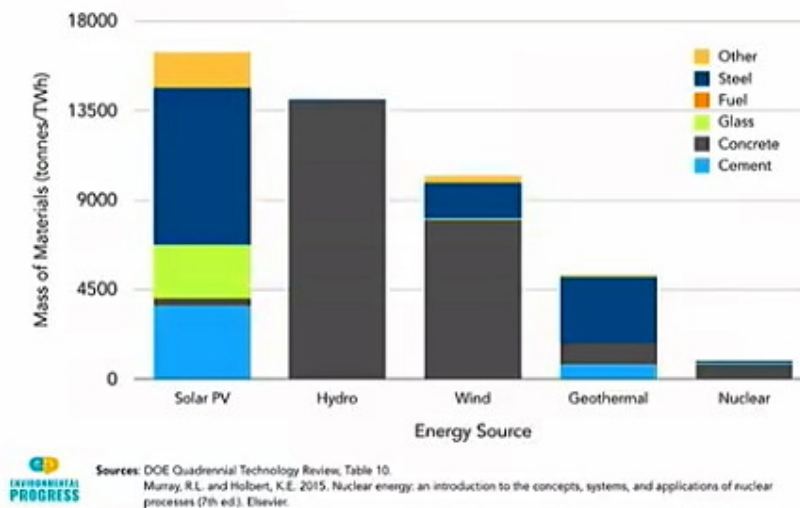
- One argument I hear against nuclear is the speed of deployment: “it’s too slow”; “we have a climate emergency, and we need the solution now”; etc. I want to clear up this misunderstanding with *facts* – all the countries (Sweden, France, Belgium, and the UAE) that have decarbonized the fastest have utilized nuclear in their strategy. This is because nuclear, as a non-intermittent source, has a high capacity factor >90% and has a long operating life of >80 years. California and Germany offer great case studies of locations where nuclear is being phased out with the intention of reaching 100% renewables, and these have failed so far. At these locations, emissions are rising; there are rolling blackouts; and the cost of electricity has skyrocketed. Net Zero Needs Nuclear!



Average annual increase of carbon-free electricity per capita during decade of peak scale-up. Energy data from (6) except California renewables data from (7). Population data from (8). See supplementary materials.

3. I also like to look at the lifecycle materials required for energy and the land required for nuclear. Because nuclear is incredibly energy dense (about 1 million times greater than that of other traditional energy sources), the land footprint for nuclear is much less per energy produced and that means more room for flora and fauna. This also means that the materials required to be mined, processed, and shipped are much less than other energy sources. Less extraction of raw materials, less processing, and less shipping. Yes please!

Materials throughput by type of energy source



- Small modular reactors represent a new market sector where nuclear can help decarbonize – cargo ships, isolated communities, and remote industrial sites (i.e. mining), just to name a few. The modular design also means that developing countries/communities can start small and expand as the population grows or as more capital is unlocked. Some of the SMR designs utilize a much higher temperature so opportunities such as district heating, hydrogen production, and/or desalinization become available opportunities.

As for the reactor itself, the BWRX-300 reactor meets and exceeds regulatory requirements as well as OPG's expectations. Incorporation of the lessons learned through nine previous generations of boiling water reactor (BWR) technology, deployed in many countries around the world, has enabled incorporation of significantly increased passive safety features above and beyond any regulatory requirement. As a result of that increased safety as well as simplicity of design, the BWRX-300 can have a much smaller emergency planning zone (EPZ). Each SMR unit will prevent 0.3 to 2 MT of CO² per year and are also beneficial from a land-use perspective, since nuclear uses 100-500 times less land when compared with wind or solar for the same energy output.

The lands on which the DNNP is situated are the traditional and treaty territory of the Williams Treaties First Nations, which includes Curve Lake First Nation, Hiawatha First Nation, Alderville First Nation, Chippewas of Beausoleil First Nation, Chippewas of Georgina Island First Nation, Chippewas of Rama First Nation, and the Mississaugas of Scugog Island First

Nation. It is also within the shared traditional territory of many nations including the Chippewa and Mississauga Anishinaabeg, the Haudenosaunee, and the Huron-Wendat peoples. NAYGN uplifts Indigenous voices and encourages the communities to raise any questions or concerns, so I am pleased to see that OPG acknowledges the Aboriginal and Treaty Rights and is actively engaged with the Indigenous communities.

What this application really offers is an economic and environmental benefit, not only to the project site but also opens the door to be deployed throughout Canada and internationally. This expansion could be the solution for off-grid mines and remote communities to replace their current diesel generating sources with clean, safe and reliable nuclear power.

In closing, I truly believe that nuclear power is the safest, cleanest, and most reliable electricity production method that should be one of the main strategies that humanity utilizes to combat climate change and protect the environment. I am happy that OPG, a company with a long history of reliable operation and a company with a 2040 Net Zero commitment, is spearheading this project. As a young professional that is passionate about the well-being of our environment for generations to come, I urge you to take this crucial step in renewing the power reactor site preparation licence, do it for the planet!

Thank you.

Matthew Mairinger