

Darlington New Nuclear Project

Project Update

April 22, 2022 – DNHC Meeting

ONTARIO **POWER**
GENERATION

Where a brighter
tomorrow begins.

Land Acknowledgment

OPG acknowledges that the Darlington and Pickering site is in the shared traditional and treaty territory of the Chippewa and Mississauga Anishnawbeg.



ALDERVILLE
FIRST NATION



BEAUSOLEIL
FIRST NATION



CURVE LAKE
FIRST NATION



GEORGINA ISLAND
FIRST NATION



HIAWATHA
FIRST NATION



SCUGOG ISLAND
FIRST NATION



RAMA
FIRST NATION

Agenda

- 1 | Climate Change Action Plan
- 2 | Small Modular Reactors
- 3 | Darlington New Nuclear
- 4 | Used Fuel Management
- 5 | Questions?



Climate Change Action Plan

- In 2020, OPG released our first ever Climate Change Action Plan.
- Catalyst for efficient, economy-wide decarbonization and economic renewal, while protecting the environment.
- Tackling climate change will take a combination of electricity generating technologies and innovative solutions.
 - **Mitigate:** Atura Power & Supply Chain
 - **Adapt:** Investment planning & Ranney Falls GS
 - **Innovate:** Energy Storage, M&D Centre & CCNS
 - **Lead:** PowerON, Ivy Charging & SMRs

A net-zero
carbon
company by

2040

A net-zero
carbon
economy by

2050

Small Modular Reactors

- SMRs are a key pillar in fighting climate change, while providing a reliable source of electricity.
- Ontario's nuclear know-how is helping lead the way for the next generation of nuclear technology.
- Province of Ontario supports the development of SMRs in Ontario; establishing the province as a leader in this emerging worldwide market.
- Stimulating creation of new jobs & Province's economic recovery.

Key Features

- Enhanced, passive safety features
- Smaller footprint
- Modular designs
- Enabler of other clean energy sources (e.g. wind & solar)
- Lower capital cost; efficient
- Off-grid applications

These three letters can help solve climate change.





A significant asset for the Province of Ontario

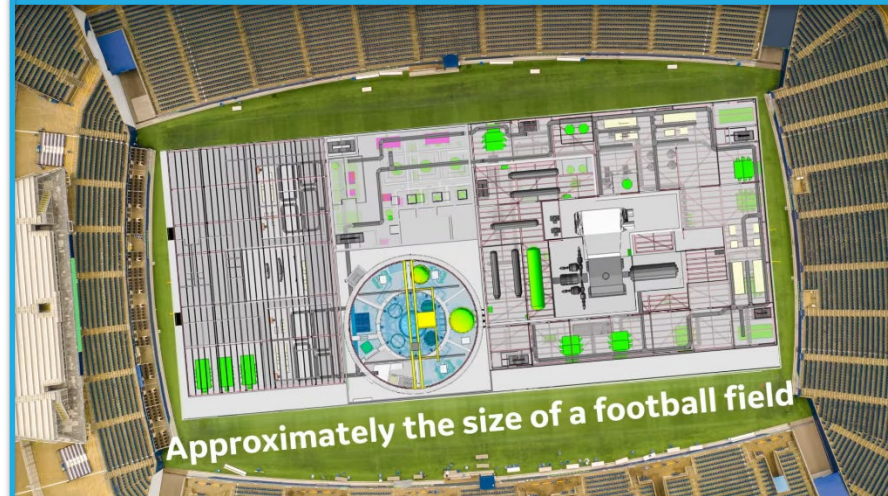
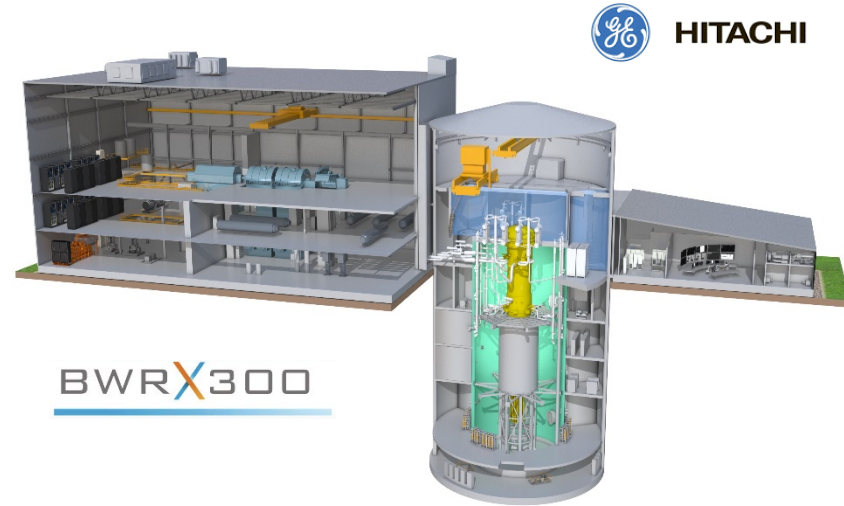


- Darlington is the only site in Canada licensed for new nuclear build with accepted environmental assessment.
- Renewed 10-year Site Preparation Licence granted by the Canadian Nuclear Safety Commission in 2021
- On Dec. 2, 2021, we announced we will work together with GE Hitachi Nuclear Energy (GEH) to deploy a Small Modular Reactor (SMR) at the Darlington new nuclear site.
 - OPG will work with GEH on SMR engineering, design, planning, and preparing the licencing and permitting materials.
- Creating new opportunities for Ontario's robust nuclear sector and supply chain.
- Allows low-carbon nuclear energy to continue playing an important role in Ontario's future energy mix.

Technology Overview

GE Hitachi: BWRX-300

- **GEH SMR Technologies Canada** is the Canadian division of the world-leading provider of reactor technology and nuclear services.
- ~300 megawatt electrical (MWe)
- Light water, boiling water reactor technology
- Generation III+ Design
- GNF2 Fuel (commercially available) <5% enrichment
- Natural circulation
- Batch refueling - Fuel Cycle 12-24 months
- Designed for a 60-year operational life



Important features – *not a comprehensive list*

- Compliance with DNNP Environmental Assessment
- Advanced safety features
- Technology ready to deploy in the 2020's
 - target to submit construction licence application in 2022, and possible to be operating about end of 2028
- Sufficient engineering and manufacturing design complete
- Nuclear by-products manageable
- High Canadian content (supply chain)
- Right size – about 300 MW electric
- Cost that fits a good business case



Site Preparation Announcement

- On March 10, 2022, OPG announced a contract award to ES Fox for site preparation, construction services, and support infrastructure for the DNNP.
- Onboarding, planning and design work is underway; site preparation work to take place on-site towards the end of 2022.

What will this contract cover?

- Infrastructure such as: water, electrical power, information technology, roads and some buildings.
- Remember, no nuclear construction can take place yet.





2022 Project Lookahead

Our goal is to build the first on-grid SMR on-schedule and on-budget at the Darlington site, as early as 2028.



Beginning of Site Preparation Activities



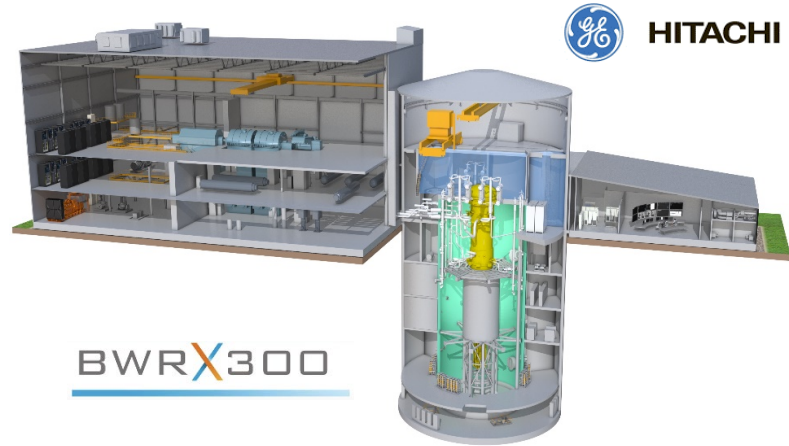
Application to the CNSC for a
Licence to Construct



Further develop the accuracy of
the cost estimate



Continue collaboration with GE Hitachi on SMR
design, engineering, planning and licensing.



Used Fuel Management

- Darlington is committed to the safe management of nuclear by-products, now and in the future, in an environmentally, socially, and financially responsible way.
- All by-products generated by OPG's nuclear power program are controlled, monitored, costed and paid for and will continue to be as long as needed.
- The NWMO has responsibility for long-term management for all of Canada's used fuel.
 - The NWMO's plan is to have a DGR in service in the 2040s for Canada's used fuel, including used fuel from new nuclear and Small Modular Reactors
- Used fuel from an SMR will be stored on-site until the NWMO's DGR is in service and ready to receive it
- OPG will continue to seek innovative ways to manage, and store used fuel through collaborations with industry and leaders in research.



Questions?



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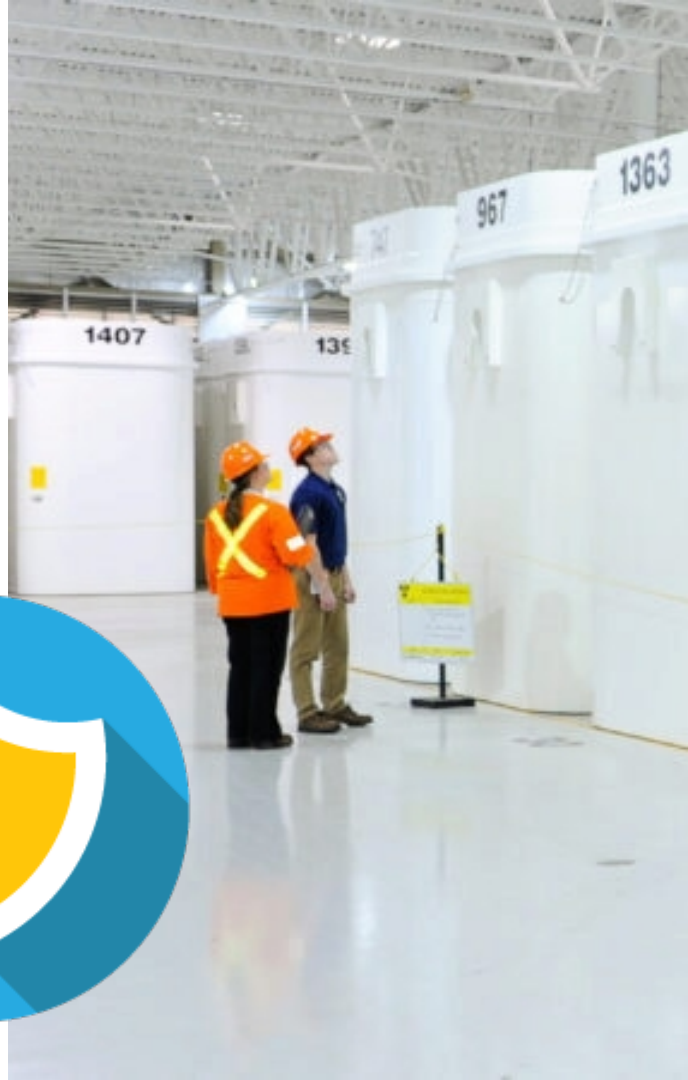
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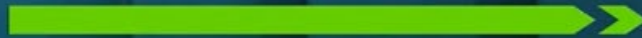
Nuclear Sustainability Services

- While nuclear energy does create a small amount of by-products that must be managed, OPG is a world-leader in safe and environmentally-sound nuclear material management.
- OPG embraces the “three Rs” – reduce, re-use and recycle – to minimize volumes of stored materials, and to divert clean materials to re-use and recycling.
- OPG nuclear facilities and processes are rigorously regulated and inspected by the CNSC.





Nuclear Sustainability Services



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