



OPG New Nuclear Update

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OPG's Climate Change Action Plan



A net-zero
carbon
company by

2040

A net-zero
carbon
economy by

2050

Small Modular Reactors

Helping us solve climate change

- SMRs are a type of advanced nuclear reactor, the **next evolution of nuclear energy**.
- Designed to be smaller in size than a traditional reactor, but also produce **safe, reliable, clean energy**.
- **Based on technology** that has existed around the world for 50+ years.
- Based on the **same science** as larger reactors:
 - Fission to create heat energy, for electricity or other heat applications (e.g. district heating, water desalination, hydrogen production, process steam)
- Same technology, **different applications** (e.g. on-grid, off-grid, advanced).

These three letters can help solve climate change.



How Did We Get Here?

▶ **May 2022**

The CNSC has approved OPG's revised financial guarantee, outlining our strategy to fund decommissioning activities associated with site preparation work.

◀ **March 2022**

OPG awarded E.S. Fox Ltd. the contract to complete site preparation activities; read more about this in the story on the left.

▶ **December 2021**

OPG selects GEH to further develop the BWRX-300 SMR design, with the mutual goal of constructing Canada's first commercial, grid-scale SMR.

▶ **October 2021**

After a hearing in June 2021, the CNSC announced approval of OPG's application to renew the existing Site Preparation Licence for a 10-year period.

▶ **November 2020**

OPG announced resumption of planning activities for future nuclear power generation using a SMR at the Darlington site.

▶ **June 2020**

OPG submitted an application to the CNSC seeking renewal of the Site Preparation Licence.

▶ **December 2013**

Citing lower than planned power consumption growth and a strong supply situation, the Government of Ontario requested OPG defer construction of new nuclear reactors but maintain the existing licence for future generation.

▶ **August 2012**

The CNSC issued the Licence to Prepare Site to OPG for a period of 10 years.

▶ **May 2012**

The Government of Canada accepted the recommendation of the Joint Review Panel (JRP) and the Environmental Assessment (EA).

▶ **March 2011**

The JRP hosted 17 days of public hearings on the EA, addressing the project need, purpose and alternatives and potential effects on all aspects of the environment.

▶ **September 2009**

OPG submitted the Environmental Impact Statement (EIS), and an updated Application for a Licence to Prepare Site.

▶ **June 2006**

OPG directed by the Province of Ontario to begin the federal approvals process for new nuclear at an existing site.

Darlington New Nuclear Roadmap

BIG things start **small**.



2021



Site Preparation
Licence Renewal
Issued

SMR Technology
Selected

2022



Site Preparation
Activities Began

Licence to
Construct
Application
Submitted

2024



Licence to
Construct Issued

2027



Licence to
Operate Issued

Commercial
Operation by the
end of this decade



Geotechnical Work

- **Phase 1** studying soil and bedrock in the future SMR construction footprint (55 boreholes) – **completed in 2021**
- **Phase 2** studying onshore and offshore soil and bedrock to ensure suitability for future condenser cooling water tunnel construction – **completed in September 2022**
- Work included **15 offshore** and **seven onshore** boreholes, including in-situ rock testing and extraction of over **1 km** of rock core
- **Marine archaeological assessment** report completed
 - no indigenous or archaeological findings
- As the drilling program progresses, vertical rock core profile information is provided to SMR designers to **continuously inform** design progression

Next steps:

- Onshore borehole work for miscellaneous support buildings and structures scheduled **Fall 2022 – Spring 2023**



Site Preparation Work

- Renewed **10-year Site Preparation Licence** granted by the Canadian Nuclear Safety Commission in 2021.
- Onboarding, planning and design work continues, while actual site preparation work began at the end of September (will run through early-2025)

In-Progress Work

- Vegetation removal (clearing and grubbing), grading
- Construction of temporary laydown, temporary parking, and temporary office areas

Installations beginning in 2023:

- Permanent domestic water and fire water lines
- Public address and fibre optic to serve construction; infrastructure to support permanent communications and security cabling
- Construction power
- Demineralized water line
- Temporary construction roads and other site road modifications



FUTURE HOME
of Canada's
First Grid-Scale
SMR



HITACHI

Licence to Construct Application

- Further approvals, including CNSC licences, are required **before any construction** or operation of the nuclear facility can occur
- Licence to Construct application and supporting information **submitted to CNSC on Oct. 31**
 - Remaining information will be submitted over next six months
- [CNSC Participant Funding](#) being offered **Oct. 24 – Dec. 2**
- CNSC **public engagement campaign** re: LTC application will run through 2023
- **Public hearing** on LTC application and supporting documents will be scheduled for 2024
 - Additional participant funding will be offered at this stage
- OPG will continue to **engage with stakeholders** and the community as the project progresses and more information becomes available

Canada's Nuclear Regulator

Participant Funding Program
Funding Application Form

PFP
Participant Funding
Program

Date: October 24, 2022
Form number: PFP 2022 DNNP-02

Canadian Nuclear Safety Commission / Commission canadienne de sûreté nucléaire

Canada



EIS Review – Context & Purpose

- The Environmental Impact Statement (EIS) **submitted by OPG in 2009** was based on a set of limiting design parameters of technologies considered at that time
 - Concept is known as a **Plant Parameter Envelope (PPE)**- approach approved by the CNSC
- OPG committed to **conducting an assessment** of effects of the design parameters not within the PPE, and a comprehensive EIS review for a specific technology, once selected
- In December 2021, **OPG selected the GE-Hitachi (GEH) BWRX-300 SMR** for deployment at the DNNP site
- The goal of the EIS review was to **confirm that the conclusion of the 2009 EIS remains valid**, given all available information on the design and deployment of the BWRX-300
- The Licence to Construct (LTC) application submitted to the CNSC on Oct. 31 is for **one BWRX-300**.
- As the DNNP considers a build out of **up to four BWRX-300** reactors on the DNNP site, the EIS review considers the deployment of four BWRX-300 which
 - This is **consistent with the project defined** and analyzed in the 2009 EIS



EIS Review – Results

The deployment of the BWRX-300 at the DNNP site *does not* change the EIS conclusion and *is not likely* to cause significant residual adverse environmental effects, provided the mitigation measures are implemented:

Specific to the BWRX-300 design:

- Nine design parameters are currently **not within the PPE** due to characteristics inherent to its design
 - Assessment of effects of these parameters shows they **do not alter the conclusion** of the EIS
- Works and activities for deployment **are essentially the same** as those evaluated in the 2009 EIS
- Effects on the environment are **generally less** than those examined in the EIS, as BWRX-300 reactors are **smaller in physical size and electrical power**
- Effects of the environment on the Project, cumulative effects, and effects from accidents, malfunctions and malevolent acts are expected to be **less than** those assessed in the EIS.
 - The significance of adverse effects and residual adverse effects **remain not significant**



Questions?

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Where a brighter
tomorrow begins.