



# Darlington New Nuclear Project Application to Renew Site Preparation Licence

Presentation to:  
Darlington & Pickering  
Community Advisory Councils

**Robin Manley**  
Vice President  
New Nuclear Development

**ONTARIO**POWER  
GENERATION



# Overview of Darlington New Nuclear Key Milestones

- OPG received a 10-year Site Preparation Licence for Darlington New Nuclear from the Canadian Nuclear Safety Commission (CNSC) in 2012
  - First in a series of licences required for a nuclear facility
- Licence granted following acceptance of the environmental assessment (EA) by a joint review panel of the CNSC and Canadian Environmental Assessment Agency
  - 17-day public hearing for EA included extensive Indigenous and public participation
- Project deferred by Province in 2013; OPG requested to maintain licence

# Renewing the Site Preparation Licence

- Application submitted June 2020
- Studies concluded:
  - Darlington site remains suitable for new nuclear
  - Based on current codes, standards and environmental conditions
  - OPG is a credible licensee to conduct activities allowed by licence
- CNSC hearing announced: June 9-10, 2021
  - Participant funding available through CNSC (deadline Nov 30)



Canadian Nuclear  
Safety Commission

Commission canadienne  
de sûreté nucléaire

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*Notice of Public Hearing  
and Participant Funding*

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# Acceptance of DNNP Environmental Assessment

- Licence was granted following completion of thorough environmental impact studies
  - Characterized existing baseline environmental conditions
  - Evaluated anticipated interactions between the project and the environment
  - Sought Aboriginal interests, technical experts and community knowledge to confirm the work undertaken and seek input
  - Identified potential impacts and appropriate mitigation measures
- Overall conclusion of EA:  
DNNP will not result in any significant adverse environmental effects, taking into account proposed design and mitigation measures



## Vision for New Nuclear at Darlington

- OPG resuming planning activities
- Envision additional nuclear capacity towards end of the decade
- Will provide low-carbon, reliable energy to meet Ontario's energy demand, support Canada's climate change goals
- Currently evaluating options that will support a sound business case:
  - Advanced safety features
  - Approximately 300 MW output
  - Meets targeted timeline
  - Supports Canadian nuclear industry (jobs, supply chain)
  - Advances pan-Canadian nuclear goals (future deployment to provinces reducing fossil fuel use)
  - Within bounding envelope of EA

# What are Small Modular Reactors (SMRs)?

- Smaller than a traditional reactor in output and footprint
- Use fission process like traditional reactors; enriched uranium fuel
- Range from community scale (<1 MW) to utility scale (~300 MW)
- Modern designs based on technology that has existed around the world for 50+ years



## Canada's Interest

- Reliable low carbon energy to reduce fossil fuel use – enable Canada to meet/exceed net-zero by 2050
- Flexible energy source: augments on-grid energy mix; off-grid industrial applications, mines and remote communities => reduce diesel; complements/enables renewables
- Jobs in the nuclear sector, GDP, economic growth





# Proposed Advantages of SMRs

- **Safety:**
  - Enhanced, passive safety features
  - Some designs underground, enhancing security
- **Simpler:**
  - Modular designs
  - Fleet-based approach controls cost, schedule
- **Adaptable:**
  - Load-following source of electricity
  - “Scale-to-fit” (can add modules)
  - Generate heat for uses beyond just electricity
- **Environment:**
  - Carbon-free energy; no greenhouse gas emissions
- **Cheaper:**
  - Lower, up-front capital investment
  - Fewer staff (construction; operations and maintenance)
  - Factory constructed
- **Enabler for other energy sources:**
  - Energy for battery charging or hydrogen for transportation
  - Desalination
  - Enable solar, wind

# SMRs: Key to OPG's Climate Change Plan

- OPG has shut down 9,000 megawatts of coal-fired generation over the past two decades
- *What's next? What can we do to make tomorrow better?*
- OPG's Climate Change Plan: our promise to be a catalyst for efficient, economy-wide decarbonization and economic renewal, while protecting the environment

**A net-zero  
carbon  
company by**

**2040**

**A net-zero  
carbon  
economy by**

**2050**

## **Net-Zero:**

Achieving an overall balance between direct carbon emissions produced and carbon emissions taken out of the atmosphere.

## Our key climate change initiatives



**Darlington Refurbishment >**



**Small modular reactors >**



**Electrification and electric  
vehicles >**



# OPG Working with SMR Developers

- Looking to deploy 300-400 MWe



## GE Hitachi BWRX-300

- 300 MWe light water, boiling water reactor

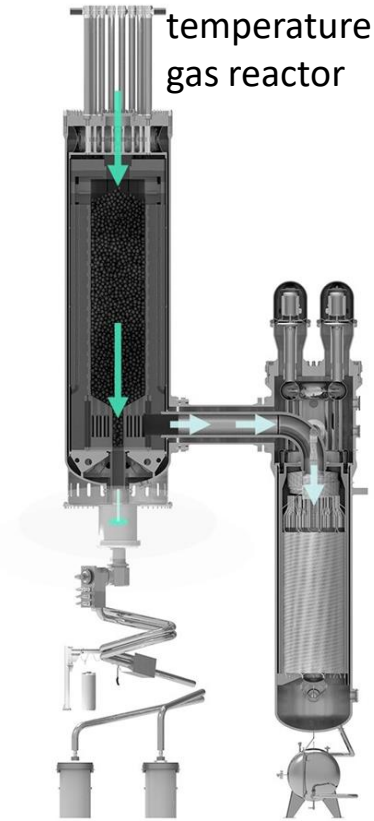
## Terrestrial Energy IMSR

- 195 MWe Integrated Molten Salt Reactor



## X-energy Xe-100

- 80 MWe high temperature gas reactor



## In Summary

- CNSC licence hearing - June 9 and 10, 2021
  - No technology selected; continuing to evaluate options
    - Decision required by end of 2021 to meet targeted timeline
  - Continuing Indigenous and public engagement in support of licence renewal and potential options for the future
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- Only site in Canada licensed for new nuclear with approved EA
  - Vision for Darlington will benefit all Canadians
  - OPG will leverage 50+ years of experience providing safe, reliable nuclear generation





[www.opg.com/newnuclear](http://www.opg.com/newnuclear)