Ontario Power Generation

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ONTARIO POWER GENERATION

Darlington Refurbishment

$12.8B investment

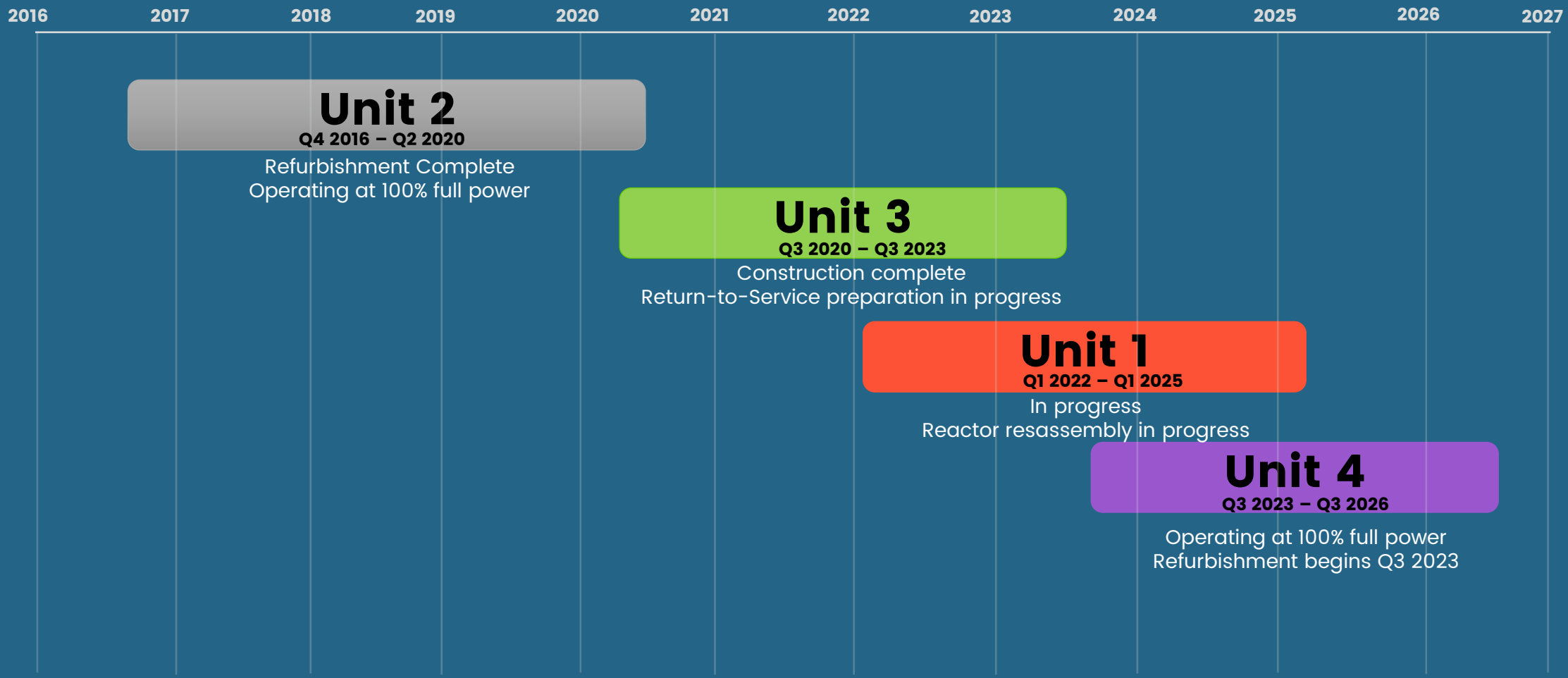
20-year project: 10 years of planning, 10 years of work. **35-44 months per unit.**

14,200 jobs per year.

$89.9B dollars into Ontario's GDP.

96% of expenditures **spent within Ontario.**

Refurbishment Outage Schedule



**Total duration 120 months*

Updated June 25, 2023

Scope and Vendors

- BWXT — Defuel, Fuel Handling
- SNC·LAVALIN Nuclear / AECON Joint Venture — Retube and Feeder Replacement
- AECON Joint Venture / SNC·LAVALIN Nuclear / GE — Turbine/Generator
- BWXT — Steam Generators
- FOX Constructors — Balance of Plant
- Black & McDonald — Cyclic Outage

Unit 2 – Complete & Lessons Learned

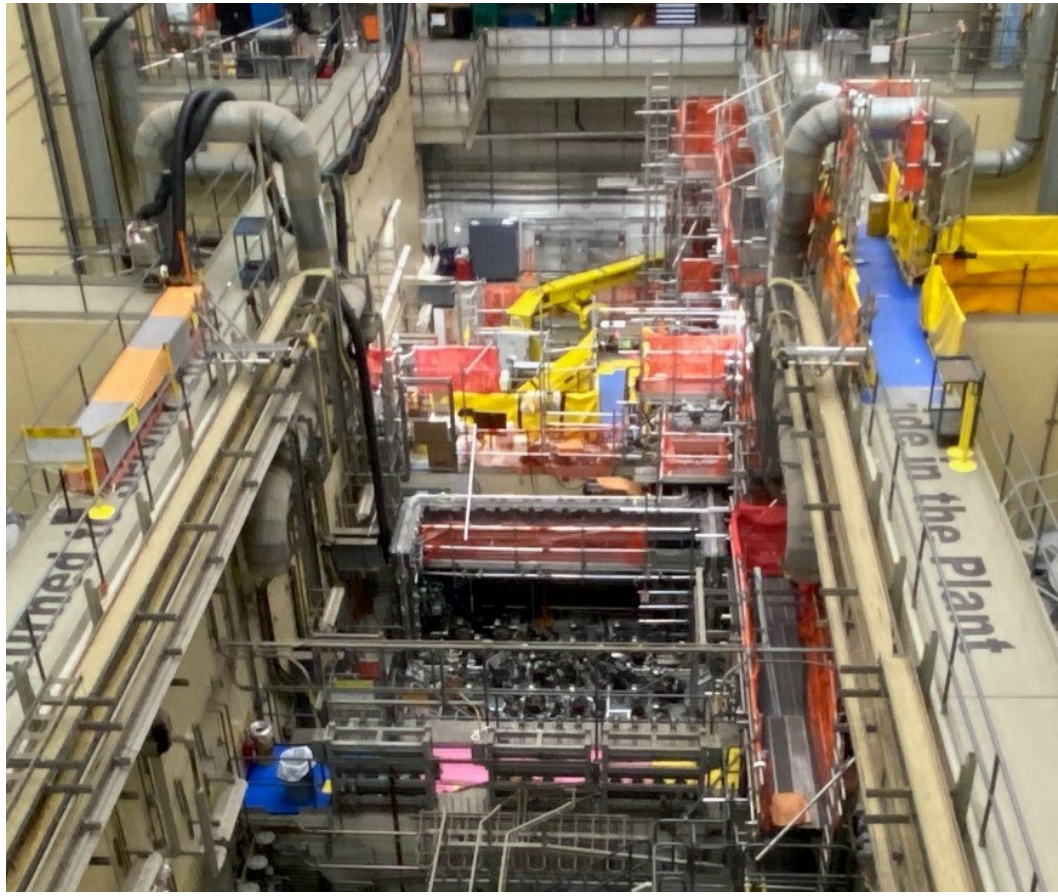
On June 4, 2020, Unit 2 was reconnected to Ontario's electricity grid, after a 44-month refurbishment.

- Over 4,000 lessons learned from the knowledge and experience gained on Unit 2 during planning and execution.

- Ongoing lessons learned built into plans for Units 3, 1 & 4.

- **UPDATE:**

    - Following the installation of an innovative Target Delivery System by Laurentis Energy Partners and BWXT Medical Ltd. in Dec 2022, life-saving Molybdenum-99 (Mo-99) isotope will be produced in Unit 2 reactor (pending CNSC and Health Canada approval)
    - A world-first for a commercial power reactor
    - Unit 2 is the only source of Mo-99 in North America
    - 30 million annual diagnostic procedures world-wide



Unit 3 Status Update

- Unit 3 Refurbishment started September 3, 2020.
- Static commissioning of Turbine Control modifications completed Sept 2022; successful first-of-a-kind at Darlington and in the nuclear industry
- 6,240 bundles of new fuel loaded into reactor (Dec 2022)
- Reactor construction complete; reactor and unit ownership transferred to Darlington station operations
- Undergoing operational testing and required CNSC approvals to return the Unit to commercial operations
- Ahead of schedule; forecasting to complete in Q3 2023
- **Update:**
    - Cobalt-60 production capabilities have been installed into Unit 3 reactor
    - Ontario CANDU reactors produce 50 per cent of the world's supply of Cobalt-60

Unit 1 Status Update

Breaker opened on Unit 1 (Feb. 15, 2022) marked the halfway point in the Darlington Refurbishment Project **and** the refurbishment of two different units at the same time for the first time ever at Darlington,

- Reactor disassembly complete (Apr 2023)
    - 960 feeder tubes, 960 endfittings, 480 calandria tubes and 480 pressure tubes
- Inspections of calandria complete
- Reassembly of new reactor components are progressing on plan
    - Calandria tube installation underway

Unit 4 Status Update

- Work planning, design engineering efforts, procurement and execution of pre-requisite work continues to progress well.
- Planning for Unit 4 is underway and scheduled to commence its Refurbishment execution in Q3 2024.
- Lessons learned and future opportunities from Units 2, 3 and 1 are being incorporated into Unit 4 planning.

Our Partners

At various times throughout the project, we have over 3,000 additional trades on site supporting Refurbishment.

DARLINGTON NUCLEAR REFURBISHMENT PROJECT

30 more years of clean electricity

Nuclear energy plays a fundamental role in Ontario's clean-energy equation

The refurbished Darlington Station will reduce greenhouse gas emissions by an estimated

297 million tonnes

That's the equivalent of removing

2 million cars per year

from Ontario's roads

1 in 5 homes and businesses are powered by Darlington with virtually no greenhouse gases

~20% of Ontario's power is supplied by Darlington – enough to serve a city of 2 million people

60% of Ontario's daily electricity needs are supplied by this province's nuclear fleet

8¢ kWh 30 years of power below average costs

Summary

Safety performance continues to exceed the construction industry in Ontario.

- Project execution continues to progress well.
- Overall program on schedule and budget.
- Darlington Refurbishment is one of OPG's key climate change initiatives.
- The refurbishment of the four Darlington units remains on plan for completion by the end of 2026.

Questions?

Pictured: Darlington Nuclear G.S. Refurbishment

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