Durham Nuclear Health Committee

April 19, 2024 • Kapil Aggarwal, Vice President, Nuclear Sustainability

All waste in our care falls under three categories of action.

Preventing

We prevent waste before it is created.

OPG's NS division takes many actions to reduce the amount of total waste we produce.

Within every level of waste we manage we are successfully finding solutions to ensure we prevent waste from being created.

Managing

We manage the waste in our care.

A small percentage of the waste generated by nuclear power must be effectively disposed of for the long term.

This action - Managing Waste - speaks to our long-term stewardship and commitment to safety. While abiding by federal and international regulations we ensure not even an ounce of waste is left unmanaged.

Harnessing

We harness waste and by-products to make nuclear power useful beyond just generation.

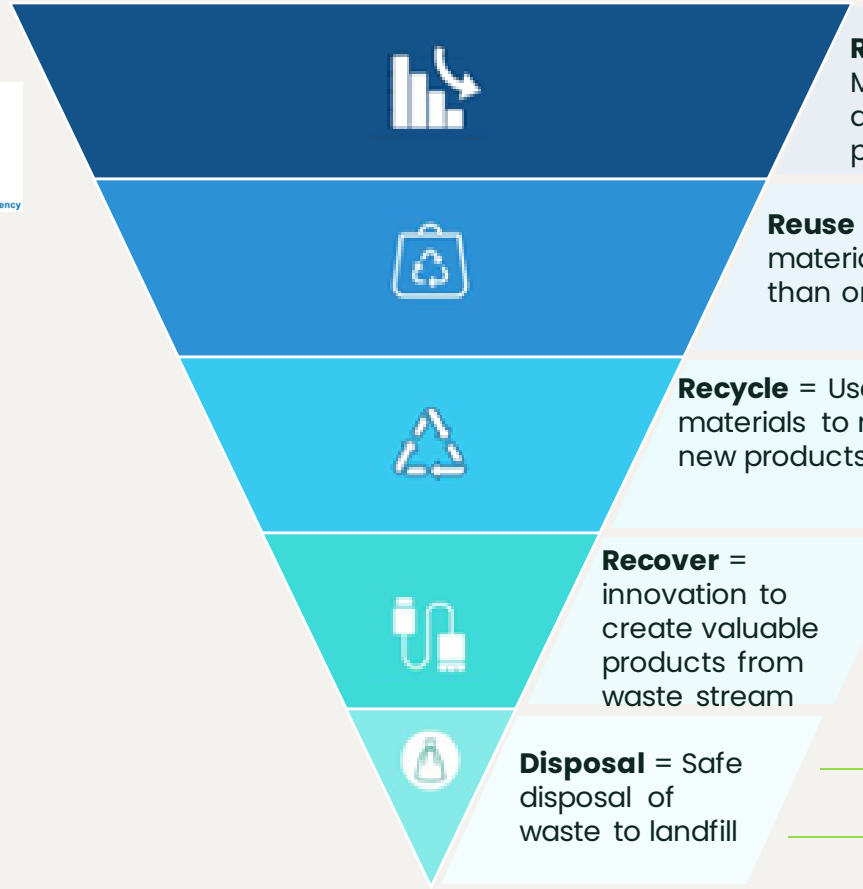
Here we find the most innovative and directly beneficial of our actions. The nuclear industry has made massive leaps in creating a more circular economy. Our waste and by-products benefit many industries including: Healthcare, Food, Pharmaceuticals, Computing, and new nuclear.

Strategic Plan: Focus on Waste Minimization

Why are we focusing on waste minimization? In 2021, we embraced the **3R's** and developed key initiatives to **reduce** our environmental footprint, to **be ready for OPG's nuclear growth program**.

Most Desirable

IAEA International Atomic Energy Agency



Reduce = Minimize the amount of waste produced

Reuse = Use materials more than once

Recycle = Use materials to make new products

Recover = innovation to create valuable products from waste stream

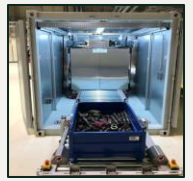
Disposal = Safe disposal of waste to landfill

Strategic Plan Main Initiatives

- Waste minimization at stations
- **WCSR Sort & Seg Facility**

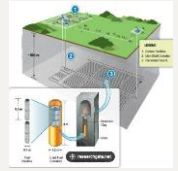
- **Resin processing & C-14 isotope capture**

- **Free release governance & research (LEP)**
- **Metal decontamination and processing**



- **By-product Isotopes** Strategy: Tritium, Helium-3, Heavy Water, Carbon-14

- LLW disposal consent-based siting
- Support NWMO DGR siting (HLW/ILW)

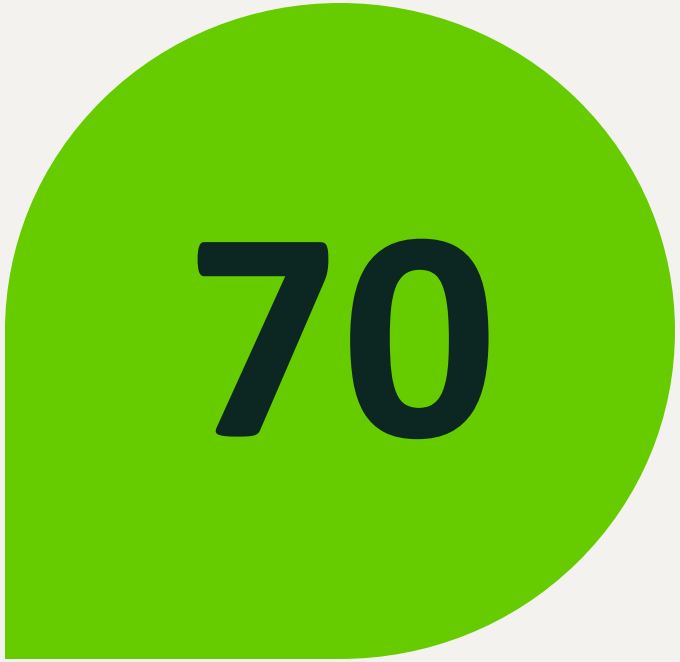


OPG

Nuclear Sustainability Services – Pickering Waste Management Facility (NSS-PWMF)

Operations

- In 2023 Used Fuel from Pickering Nuclear Generating Station (PNGS) continued to be removed from the station, and stored safely and on time.
- In 2023, Pickering loaded 70 Dry Storage Containers (DSCs), hitting our 2023 target of 70.
- Current 10-year operating licence to 2028.



Dry Storage Containers loaded and transferred in 2023

Nuclear Sustainability Services – Darlington Waste Management Facility (NSS-DWMF)

Operations

- In 2023, Used Fuel from Darlington Nuclear Generating Station (DNGS) continued to be removed from the station, and stored safely and on time.
- In 2023, DWMF loaded 57 DSCs, hitting the target of 57.
- The Retube Waste Storage Building provides on-site storage in support of Darlington Refurbishment.
- Received 10-year license renewal in 2023 to 2033.

Dry Storage Containers loaded and transferred in 2023

Safety

Nuclear Safety

- Public and employee safety remains OPG's top priority.
- Safety Analysis demonstrates that public and worker dose remains within CNSC regulatory limits during normal operations, and within Safety Report acceptance criteria due to credible accidents and malfunctions.
- OPG's exemplary record of public and employee safety is supported by the Waste Management Facility Safety Report summary, available on Reporting > Regulatory reporting - OPG

Radiation Safety

Radiation Protection has four key objectives:

- Keeping individual doses below regulatory limits.
- Preventing unplanned exposures.
- Maintaining individual risk from lifetime radiation exposure at an acceptable level.
- Ensuring collective doses are As Low As Reasonably Achievable (ALARA).

Pickering Refurbishment & Decomissioning

01 Refurbishment of ***Units 5-8*** at PNGS

02 Decommissioning of ***Units 1-4*** at PNGS

03 Securing more than ***2100 megawatts*** of clean, reliable nuclear power

Loading 6-Year Cooled Fuel into DSCs at NSS-PWMF PN

- OPG has requested an amendment to the Waste Facility Operating Licence (WFOL) at NSS- PWMF to allow for the storage of minimum 6-year cooled fuel to support PNGS Units 5-8 Refurbishment defuelling activities.
- Submission to the Canadian Nuclear Safety Commission (CNSC) for this Licence amendment was completed in June 2023 with a written hearing scheduled Q2 2024.
- The storage of 6-year cooled fuel at NSS-PWMF has been assessed and will have negligible effect on the safe operation of PWMF, public, environment and worker safety.

Storage Building 5

- A new storage building is required to provide adequate storage space for DSCs at NSS-PWMF until a permeant Deep Geological Repository (DGR) is in-service in mid 2040s. The planned capacity of Storage Building 5 is 1,400 DSCs.
- Initial planning is underway to construct the storage building, with construction planned for 2026.
- Existing WFOL allows for up to a total of six (6) storage buildings onsite.

Pickering Component Storage Structure (PCSS)

- To support the refurbishment of Pickering NGS Units 5-8, additional onsite interim storage space for removed L&ILW reactor components is required.
- A Letter of Intent to construct the PCSS was submitted to the CNSC on February 1, 2024.
- License Amendment Submission to CNSC is planned for Q2 2024.

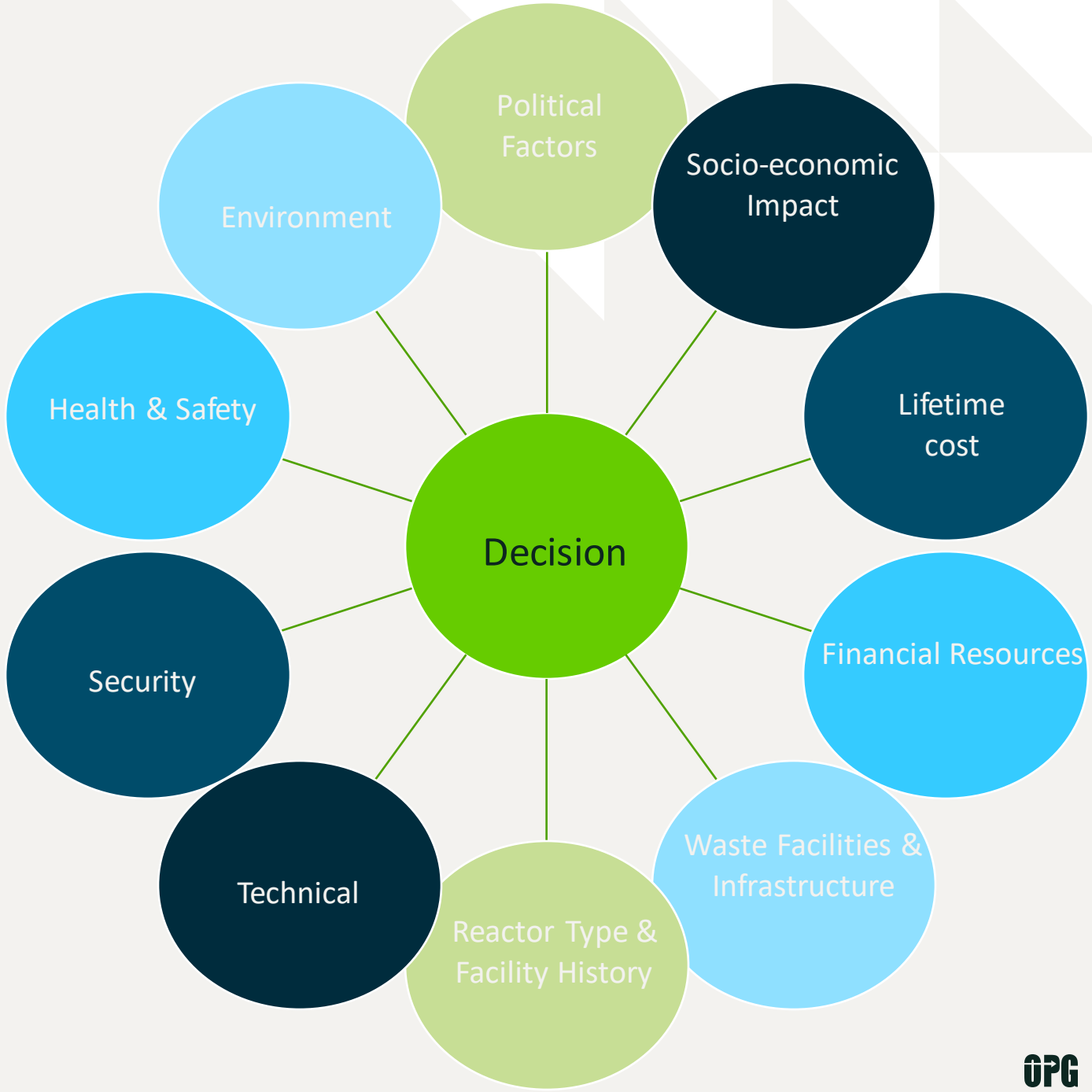
Airborne Emissions Monitoring

- The Darington Nuclear site has 18 stack monitoring points for airborne emissions
- Pickering Nuclear site has 29 stack monitoring points for airborne emissions
- Monitoring requirements are added or removed when risk and operation changes.
- OPG has demonstrated that radiological air samplers for Used Fuel Dry Storage facilities (DSC) at the Darlington Waste Management Facility (DWMF), Pickering Waste Management Facility (PWMF) and Western Waste Management Facility (WWMF) are unnecessary and can be removed.
- OPG will continue to maintain comprehensive monitoring programs, including radiological and non-radiological airborne emissions, groundwater, subsurface drainage, and environmental risk assessments. These programs consider all potential impacts to the environment from site wide operations.

Decision Factors

OPG will utilize a Decision Matrix to develop decommissioning plans that are safe, scientifically-sound, sustainable, fiscally responsible, and aligned with international best practices.

The framework will incorporate regulatory requirements, operating experience and input from Indigenous Nations & Communities, and Municipalities, as well as our industry partners.



Unlocking the promise of tomorrow

- OPG's reactors also produce valuable Isotopes:
- Tritium, used in the production of self-powered lights, medical research, and nuclear fusion development
- Laurentis is also helping to extract high-purity Helium-3 (He-3), a rare isotope used in quantum computing, border security, and medical imaging

Thank you.

Questions?