Canadian Nuclear Laboratories | Laboratoires Nucléaires Canadiens

# Small Modular Reactor Initiatives at CNL

Canada – Romanian Partnership in Nuclear Technologies - Small Modular Reactors Panel

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**Advanced Reactors, CNL**

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# A national lab focused on national priorities.

- Canada's national nuclear laboratory
- Over 50 unique laboratories
- Diverse team of ~3,300
- Laboratory and Project Sites:
  - Chalk River Laboratories, Ontario
  - Whiteshell Laboratories, Manitoba
  - Historic Waste Program / PHAI, Ontario
  - National Innovation Centre for Cybersecurity, New Brunswick
  - Prototype reactors and legacy facilities

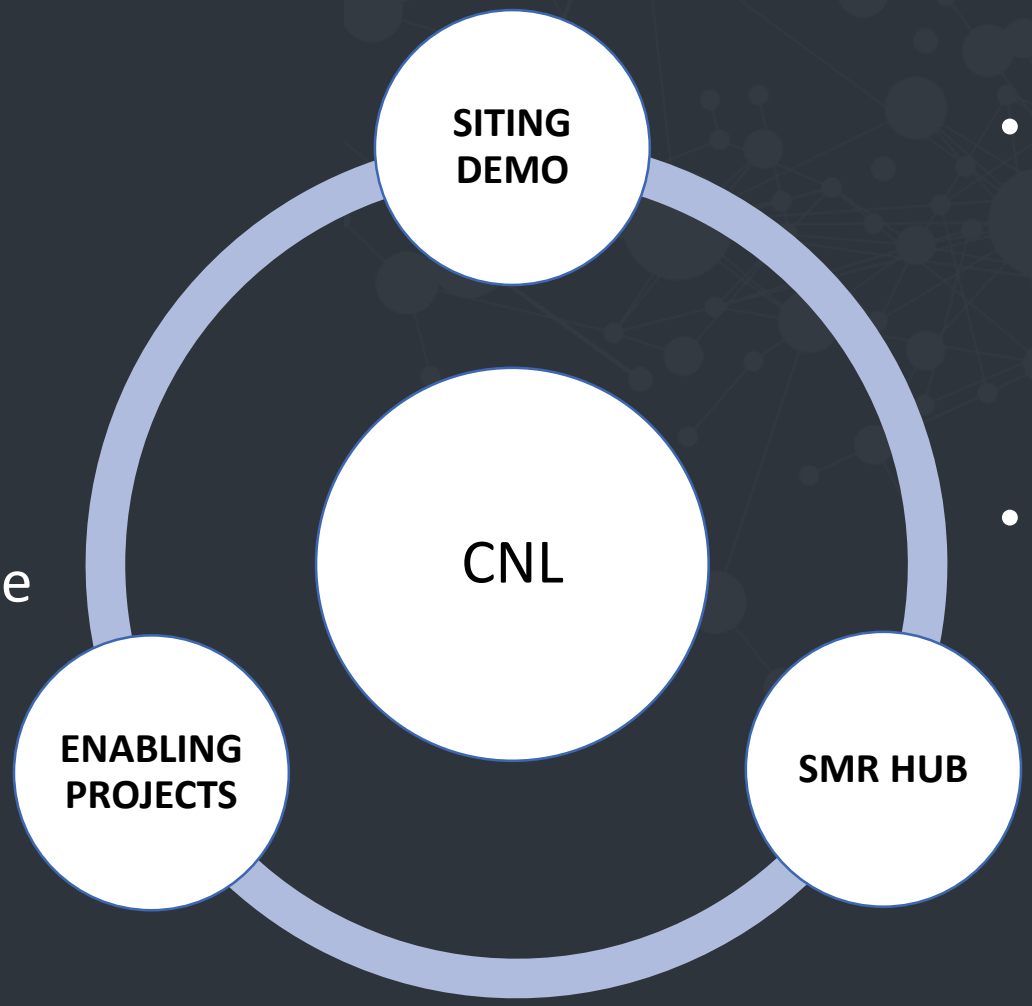
Restore and protect the environment

Clean energy for today and tomorrow

Improve the health of Canadians

# CNL SMR Strategic Initiative

- Invitation to Site a Demonstration SMR at a CNL Managed Site
  - 4 step process
  - 1 Project Progressing
  - License to prepare site submitted




- SMR Hub
  - Capability Building
  - R&D Activities
  - Collaborations
- Enabling Projects
  - CNRI
  - CEDIR (future)

# Siting Invitation Process Update

Stage 1: Pre-qualification → Stage 2: Due Diligence → Stage 3: Negotiation of Land Arrangement and Other Contracts → Stage 4: Project Execution

UBATTERY Local Modular Energy

TERRESTRIAL ENERGY

STARCORE NUCLEAR

GLOBAL FIRST POWER

- GFP jointly owned by OPG and USNC
- Submitted application to CNSC for a licence to prepare site at CRL in March 2019
- CNSC Record of Decision related to Environmental Assessment scope – July 2020
- GFP Environmental Impact Statement work commenced
- Completed geophysical site evaluations for deployment of GFP's MMR reactor in Chalk River

# CNL Demonstration Timeline

Launch CNL Invitation Process and First Intake 2018

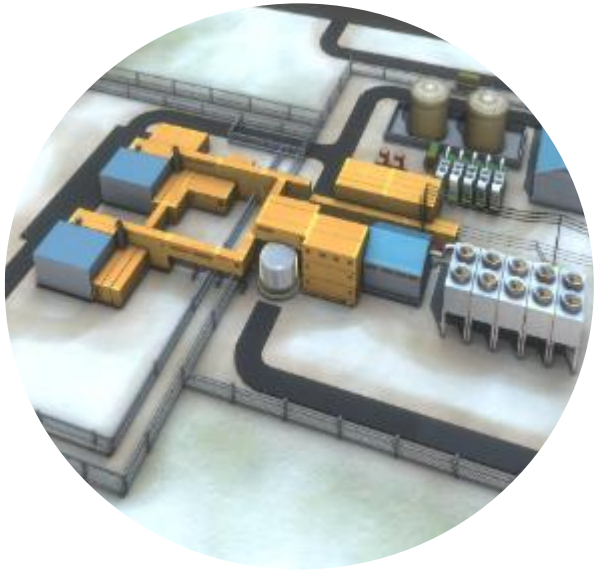
1st Licence Application in Canada 2019

Licence to Prepare Site 2022*

Licence to Construct and Licence to Operate 2023*

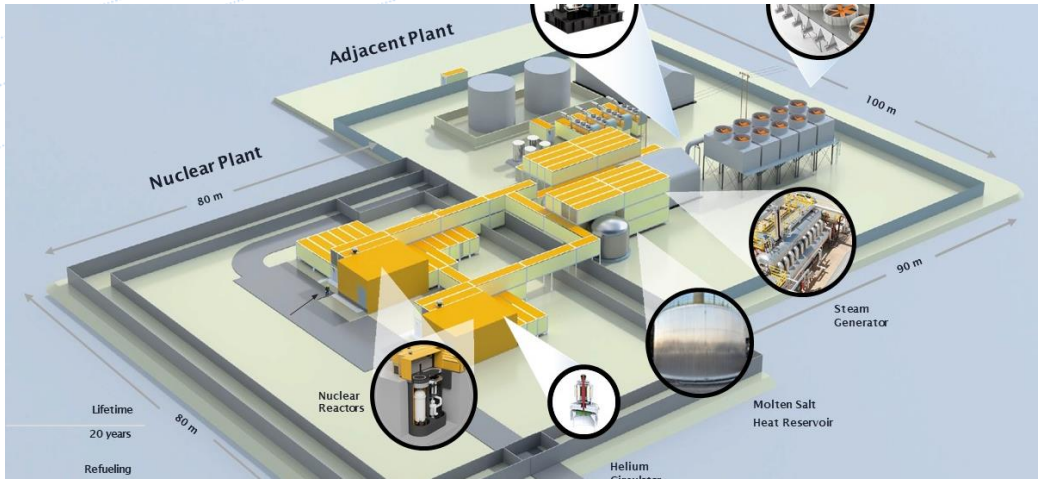
SMR First Power 2026

**Energy Offtake ~2027-2028**

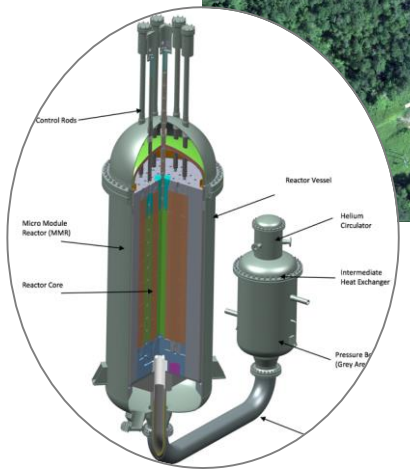


GLOBAL FIRST POWER

# GFP Demonstration Project at CNL

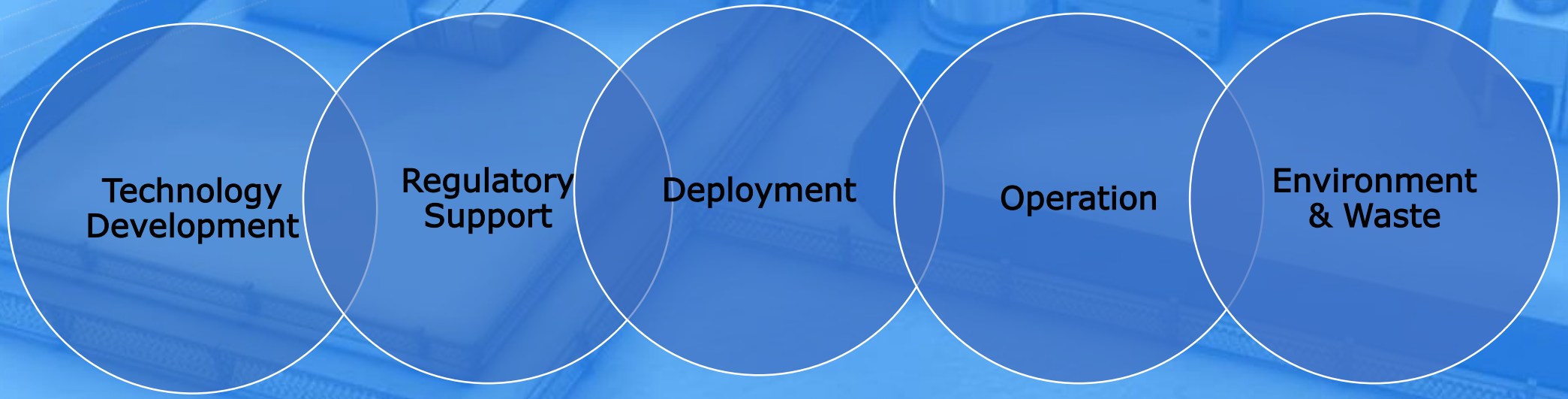


- Gas cooled reactor
- 5 MWe/15MWth
- Can produce electricity or thermal energy
- 20 year no refueling
- Modular design and construction



# Advanced Reactor Research at CNL

## De-Risking Development & Deployment



# Canadian Nuclear Research Initiative (CNRI)

**Support Development**
Equip the SMR community with the technical support required

**SMR Deployment**
Accelerate the deployment of safe, secure, clean, and cost effective SMRs in Canada

**CNL SMR Hub**
Achieve CNL's vision to become a global hub for SMR research and development and demonstration

- **Feasibility Studies, Co-generation & Economics**
- **Reactor Physics & Fuel**
- **SMR Component Degradation**
- **Safety, Security and Licensing**
- **Tritium Management**
- **Thermalhydraulics**

## A cost sharing program with SMR Developers

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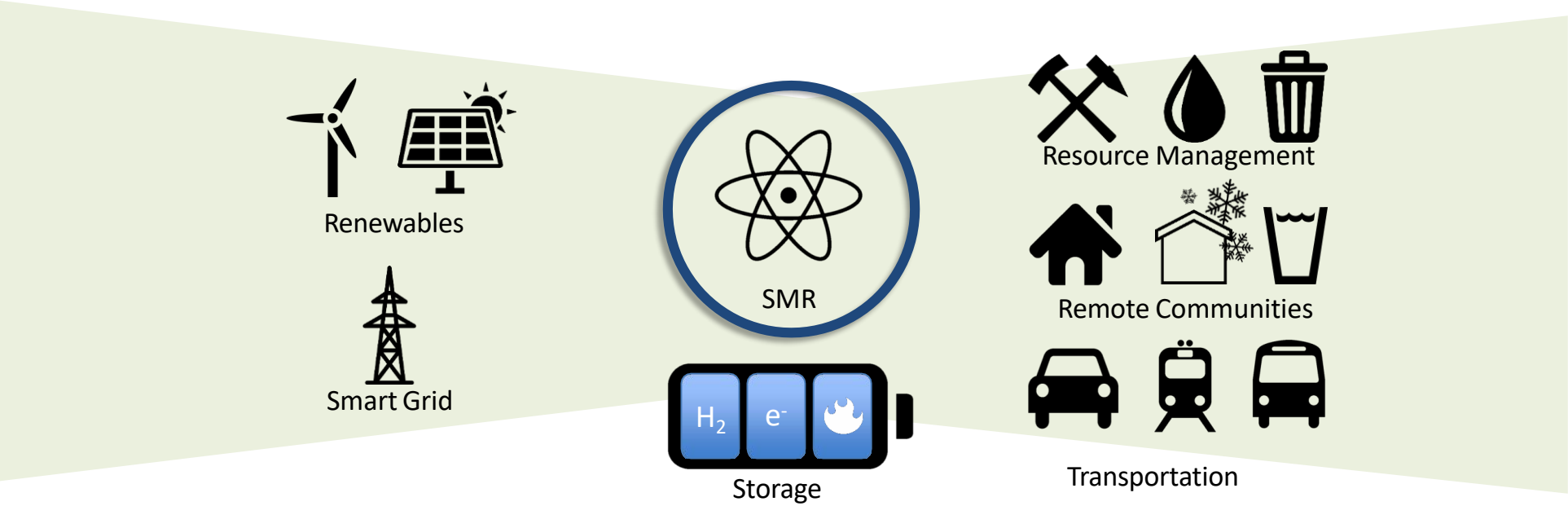
# Clean Energy Development Innovation and Research (CEDIR) Park

## Demonstrate Nuclear Co-Generation (future project at CNL)




| Demonstration platform | Enable low-carbon systems | Prototype diverse applications |
|---|---|---|

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