New Nuclear Project Impact Assessment in Canada: Navigating First-of-a-Kind Projects in an Uncertain Regulatory Landscape

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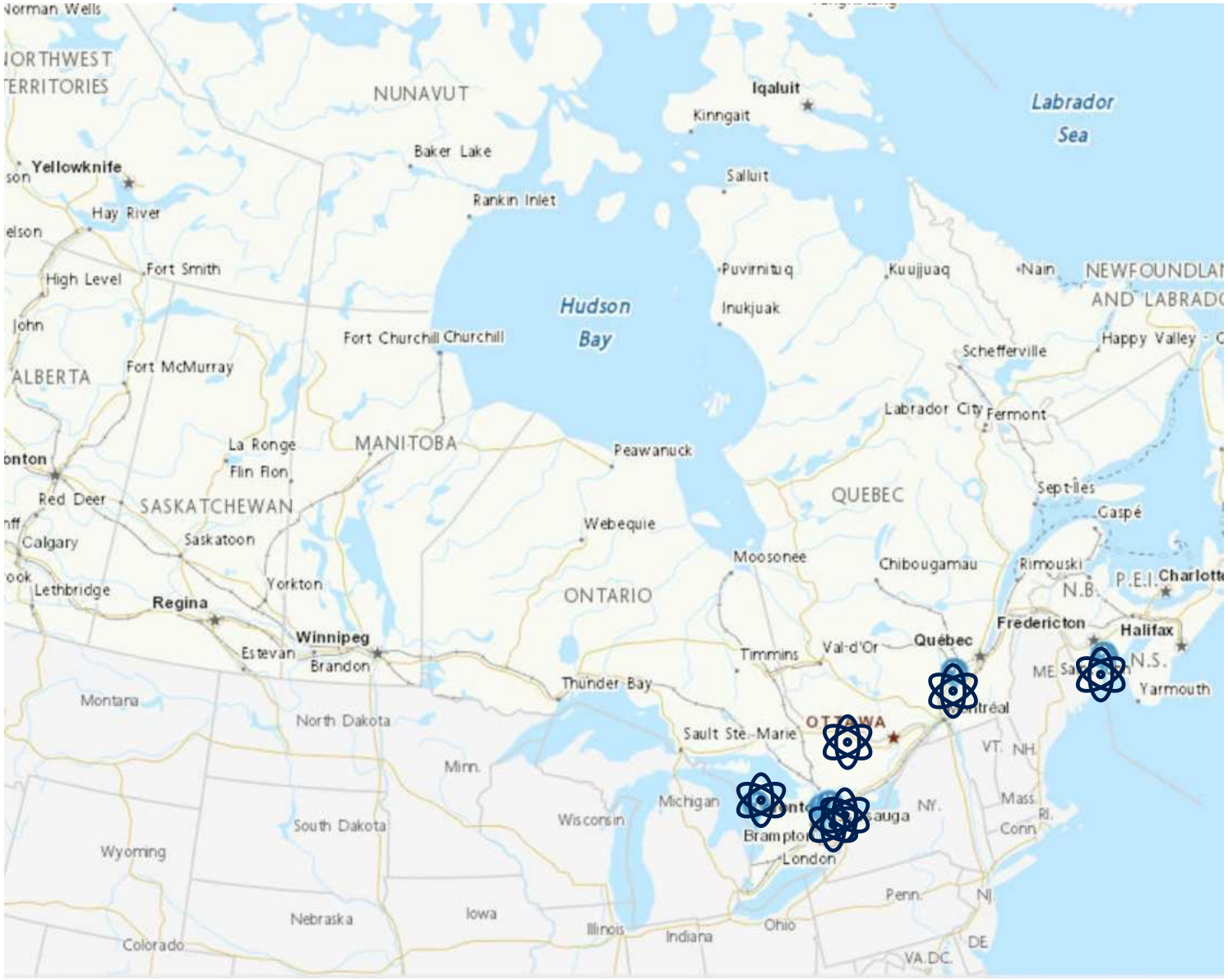
Calian Nuclear

Licensed Nuclear Facilities

Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire

IMPACT ASSESSMENT AGENCY OF CANADA



Calian Nuclear's Role in the Canadian Nuclear Landscape

Environmental Protection

Radiation Protection

Decommissioning and Waste Management

Nuclear Safety and Licensing

Emergency Preparedness and Training

Project Controls and Project Management

Systems Engineering and Robotics

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Designated Projects

- *Physical Activities Regulations* governs whether new projects in Canada will be subjected to an Impact Assessment
- Nuclear Facilities, Including Certain Storage and Long-term Management or Disposal Facilities

> **27** The site preparation for, and the construction, operation and decommissioning of, one or more new nuclear fission or fusion reactors if
>
> **(a)** that activity is located within the licensed boundaries of an existing Class IA nuclear facility and the new reactors have a combined thermal capacity of more than 900 MWth; or
>
> **(b)** that activity is not located within the licensed boundaries of an existing Class IA nuclear facility and the new reactors have a combined thermal capacity of more than 200 MWth.

[2]

Sources of Uncertainty

- First-of-a-Kind Technology and Technological Ambiguity
- Regulatory Uncertainty
- Uncertainty Related for Indigenous Communities and their Role in the Assessment Process
- High Demand for Nuclear Professionals to Assist in New Projects
- Rapidly Shifting Culture for Proponents

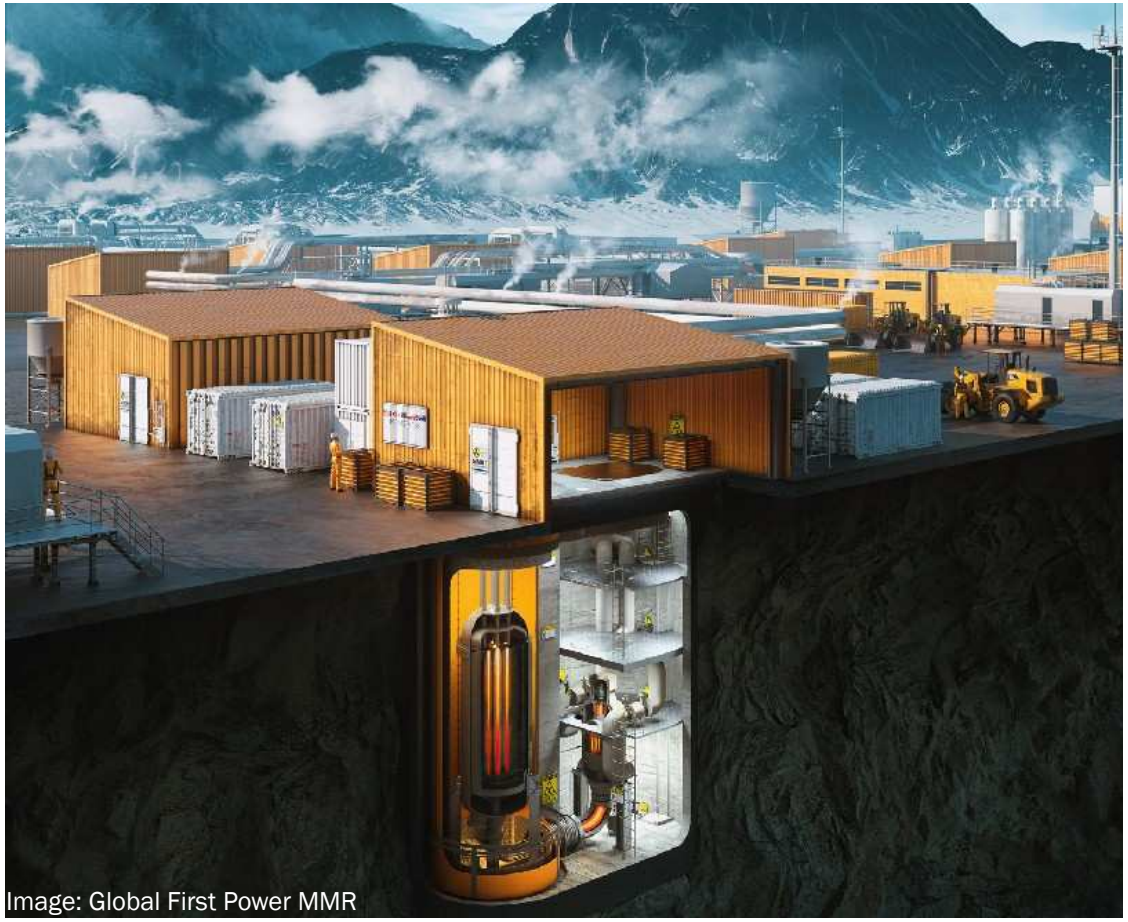
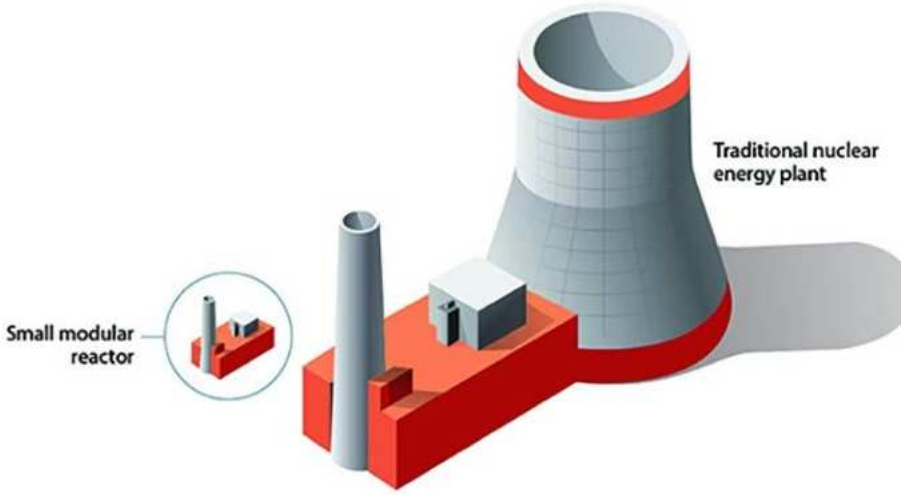


Image: Global First Power MMR

First-of-a-Kind Technology

- New technologies for improvements in safety and efficiency. Some examples of projects considering the use of new advanced and small modular reactors include:
  - GFP Micro Modular Reactor at Chalk River
  - NBPower aSMR (Moltex and ARC)
- First-of-a-Kind Technology introduces risk, such as uncertainties in defining project parameters for assessment & licensing.
- Additionally, proponents may wish to defer technology selection and employ a Plant Parameter Envelope approach during Impact Assessment.
- Plant Parameter Envelope approach allows for flexibility, and manage risks associated with technology uncertainties.



- However, the Plant Parameter Envelope approach can create challenges during Impact Assessment, including the need to assess multiple scenarios, and may be more difficult to explain to the public.

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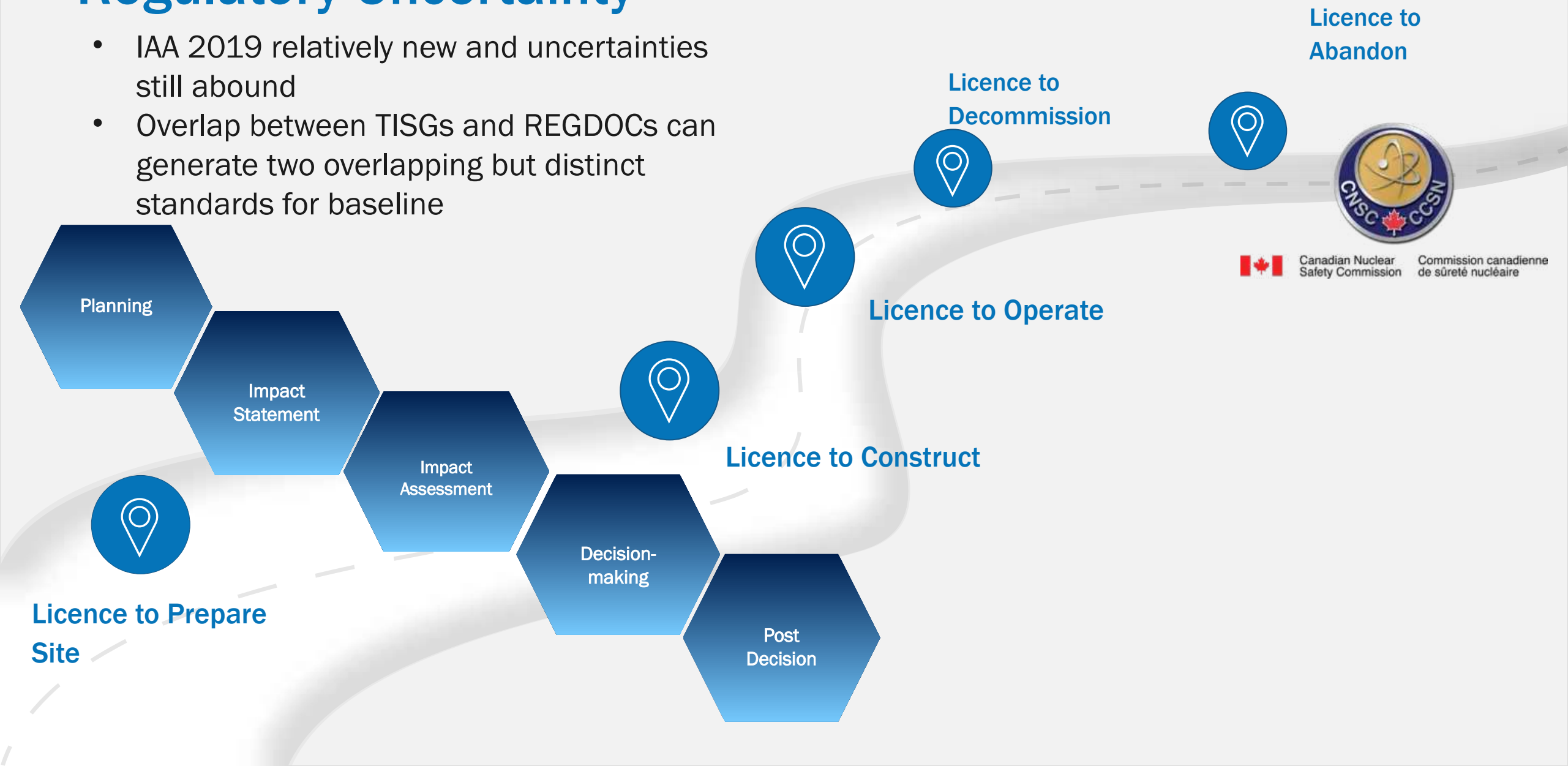
Regulatory Uncertainty

- IAA 2019 relatively new and uncertainties still abound
- Overlap between TISGs and REGDOCs can generate two overlapping but distinct standards for baseline



Uncertainty for Indigenous Communities and their Role in the Assessment Process

- There are long standing histories between Indigenous Nations and communities, project proponents, and regulatory agencies that need to be considered in forward looking relationships and discussions
- Many communities face capacity issues which can challenge proponent-led timelines
- Communities are seeking clarity on their role in the assessment process and how they can be supported to fully participate
- Communities must be involved in the assessment process early, to be informed, and to inform, the assessment process
- Indigenous led assessments are new and more needs to be known about how to ensure they are fully integrated into the assessment process
- Factors such as community ownership of data, and how data may be used, need to be considerations in the assessment process (i.e., OCAP® Principles)

High Demand for Nuclear Professionals to Assist in New Projects

- There is a 17% increase in the nuclear workforce since 2019; the growth in the workforce translates to $22 billion annual contribution to Canada's GDP.
- The nuclear industry currently employs 89,000 individuals.
- Internationally, the IAEA forecasts nuclear capacity to double by 2050 – and thus, requiring more than 4 million professionals to support the industry.
- One-third of the existing workforce is expected to retire by 2033, this means that the industry will need more than one million new professionals to fill vacancies and support the growth of nuclear industry.
- 89% of nuclear jobs are classified as "high skill", requiring university degrees and specialized techn

Source: CNA 2024

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Rapidly Shifting Culture for Proponents


Image: GE Hitachi BWRX

- Historically, public attitudes towards nuclear have challenged engagement on the sector, and still many that feel unfavourably towards nuclear energy
- Communicating risks of Nuclear Power projects to members of the public remains a significant challenge
- Licensing is standard, but IA is a new concept for Nuclear Proponents to understand
- Nuclear utilities are under significant pressure to develop new facilities due to decarbonization and energy demands

Conclusion

- Proponents are navigating significant uncertainty from multiple forces
- Demand for projects is expected to increase
- Technological uncertainty and regulatory uncertainty will improve as more projects move forward
- Approaches to managing uncertainty require cooperation and collaboration between proponents, regulators, and Indigenous Nations and communities
- Nuclear engagement is shifting to become more open and transparent

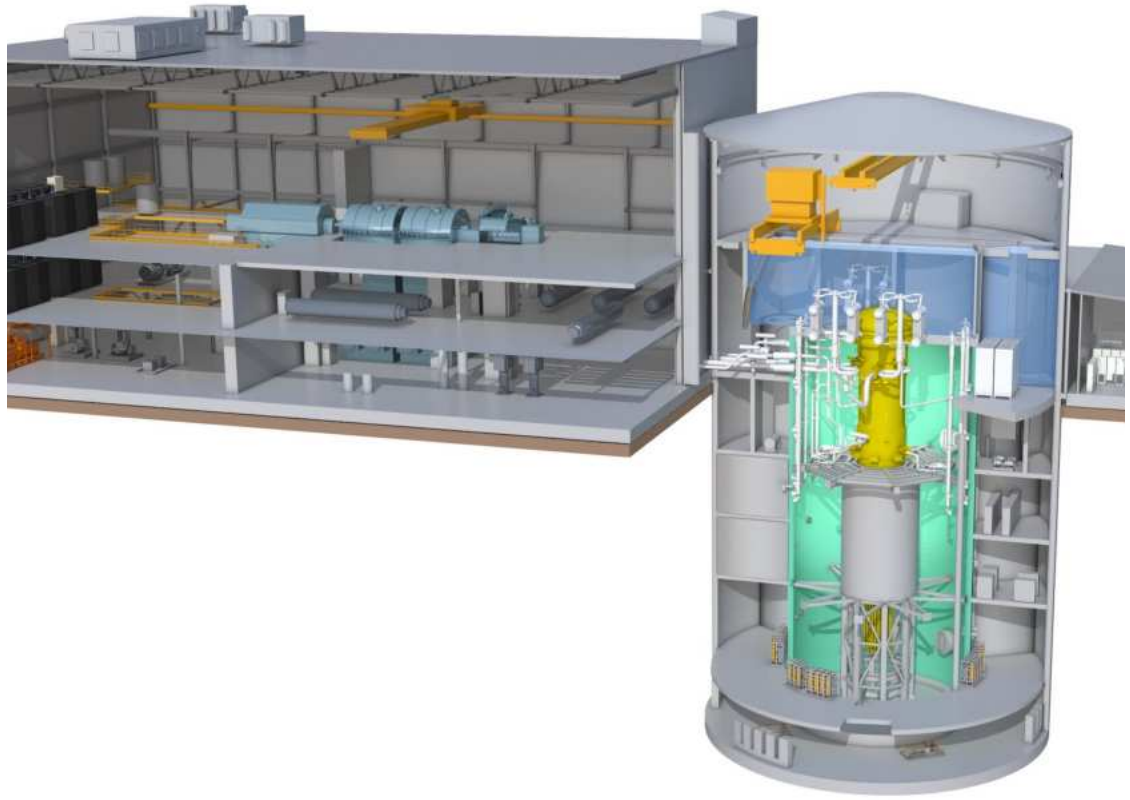

Image: GE Hitachi BWRX Cutaway

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Nuclear Science Week

Thank you

Questions?

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References

[1] Government of Canada, “Impact Assessment Process Overview,” 21 06 2024 [Online]. Available: https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/impact-assessment-process-overview.html

[2] Government of Canada, *Physical Activities Regulations (SOR/2019-285)*, 2019.