Modernizing Canada's Radioactive Waste Management Regime: Considerations for Policymaking

Claudine Bradley, Jeremy Brady, Mathieu DesRoches,
Olivia Kwik, Timur Sharapov & Andra Taylor

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Carleton University

BACKGROUND

In November 2020, the Government of Canada (GoC) made a formal commitment to achieve net zero emissions by the year 2050. Without nuclear energy in the electricity power mix, Canada risks failure in meeting its climate change targets. Central to the inclusion and potential expansion of nuclear energy, is the safe, long-term management of radioactive waste. There is consensus internationally amongst regulators and government agencies that Deep Geological Repositories (DGR) provide the safest method of disposing of intermediate and high-level radioactive waste. Development of a modern nuclear waste management policy, which includes the creation of a DGR, requires a new, comprehensive and robust public and Indigenous engagement strategy.

ISSUE

In Canada, attempts to build community support and achieve consent for a DGR have been unsuccessful over several decades. While technically feasible, significant concerns remain about the safety of the storage technology. Equally, there appears to be a mistrust of the organizations currently tasked with informing and engaging Canadians on the issue of nuclear waste disposal. To date, the Government of Canada (via the Canada Nuclear Waste Management Act) has relied on the Nuclear Waste Management Organization (NWMO), a not-for-profit organization established by Canada's nuclear electricity producers, to inform and engage Canadians on DGR. Without the requisite trust, social acceptance of responsible waste management and expanded nuclear energy development cannot be achieved.

CONSIDERATIONS

The following considerations have been identified in relation to future DGR acceptance and development in Canada:

1. **There is an increasing need to find a long-term disposal and storage solution**: Disposal is the final step in the responsible management of radioactive waste; it refers to the placement of radioactive waste without intention of retrieval. In Canada, the absence of an approved DGR has resulted in existing nuclear operators temporarily storing increasing amounts of waste on site. According to the NWMO, there is a current inventory of approximately 3 million used nuclear fuel bundles in Canada. At the end of the planned operation of the nation's existing nuclear reactors, the number of used fuel bundles could total 5.5 million.

   The absence of a facility to permanently dispose of nuclear waste also represents a major hurdle to nuclear power expansion and achievement of the Government's climate change targets. Building public acceptance for long-term nuclear waste disposal is necessary to resolve this issue.

2. **Social acceptance remains a challenge in securing a host site:** Social acceptance of a DGR requires clear and relevant communication by a credible messenger. Successful engagement of stakeholders and potential participant communities will hinge on building understanding, trust and demonstrating that the proposed project and siting is safe through well-grounded evidence and data.

   Consultations would benefit from a modernized approach that focuses on local interests and needs with emphasis on empowerment of affected communities and people. This strategy moves away from traditional "show-and-tell" engagement models towards development of solutions that all parties perceive as fair and beneficial. Notably, a well-designed and executed Indigenous engagement strategy is critical to this effort as several potential DGR sites are located on traditional lands and territories. A modern approach to stakeholder engagement is based on two central tenets:

   a. **Localized, informed consultation** as the basis for consent, knowledge development and rule-setting. This includes allowing communities an opportunity to provide suggestions regarding means for increasing trust in a project (e.g., evidence of safety/environmental protection that is site specific

and reproduced locally, requesting increased industry oversight, etc.). Accepted best practices include:

i. providing stakeholders with ample time to digest information, express opinions, and provide input;

ii. sharing of specific, local, and relevant issues to the consulted party; and

iii. providing stakeholders with periodic updates of project impacts on the community and environment when a project proceeds to development.

b. Adherence to **Nation-to-Nation consultative principles**, which includes:

i. adopting a distinctions-based approach to engage impacted Indigenous groups;
ii. building a relationship based on recognition of established Treaty rights, respect, co-operation and partnership; and
iii. consideration of unique was to target engagement, above and beyond traditional consultation activities to ensure Indigenous groups and organizations are able to meaningfully participate.

3. International experiences and best practices offer potential solutions: The challenge of obtaining social license to build a DGR is not unique to Canada. This has also been the case in countries such as Sweden and Finland. In 2015, Finland's government became the first to approve construction of a DGR. Greater national support has been facilitated through two strategic approaches, including:

a. In Finland, the **establishment of an independent advisory body** supported the development of public trust in the science, the scientists, and public authorities. The *Advisory Commission on Nuclear Safety's* evaluations, information, and advice facilitated greater community understanding and support for the creation of a DGR there. Canada does not currently have an independent scientific advisory body, distinct from government, the regulator and industry. Canada could benefit from an adaptation of the Finnish model in which a body would conduct independent scientific reviews of proposed nuclear projects and technologies (including DGRs), provide advice to all stakeholders including the general public, Indigenous peoples, potentially impacted communities, the regulator, and the government; and offer non-partisan evidence-based recommendations to mitigate potential environmental or human harms; and

b. In Finland and Sweden, **community-focused economic incentives** have proven effective in garnering municipal support for DGR projects. Finland's Olkiluoto local council approved a DGR project there after accepting tax revenue sharing and a municipal compensation package. In Sweden, municipal approval was granted for a pending project, which would trigger investments of approximately USD 2.2 billion and the creation of about 1500 local employment opportunities. It should be noted that in Canada, similar offerings of economic incentives by industry have been met with some cynicism. This may be the result of the current structure that places the NWMO (and the perceived industry agenda) at the centre of these discussions. Given the success of this strategy in other countries, a more successful effort in Canada may require a neutral party to negotiate incentives and municipal compensation.

RECOMMENDATIONS

Several actions are required to build community understanding and the societal trust needed for the Government to advance long-term management of nuclear waste through development of a DGR. The following recommendations are proposed in order to help achieve this:

1. The Government should establish an independent national advisory committee on nuclear safety;
2. The Government (via NRCan) should lead all stakeholder engagement efforts (including related negotiation of economic incentives) and the NWMO should be relegated to the role of participant/stakeholder as it represents nuclear industry's interests; and
3. The Government should adopt and implement a modern engagement approach using accepted best practices discussed above.