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

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

Career Development for Regulatory Professionals
Certificate Program
Capstone Project 2020-2021
Carleton University

Presentation Narrative

Introduction

My name is Mathieu DesRoches and I am here with my colleagues Claudine Bradley, Jeremy Brady, Olivia Kwik, Timur Sharapov, and Andra Taylor.

I hope you got the materials in advance of our discussion today and I'll start off by saying if its alright with you, we will proceed through the slides and if you have any questions feel free to interject and then we'll have time for questions at the end.

As you can see, based on our title slide today, we will be talking about recommendations around radioactive waste management in Canada, and in particular, we are going to be looking at recommendations to build support for, and address social issues around effective long-term radioactive waste management. What I will note to begin is that the technical issues around radioactive waste management are largely addressed, and so we are going to be focusing on the sticking point, which has been social acceptance to date.

Purpose

As I said, we will be talking about radioactive waste in Canada and factors needed to implement a modern solution. At present, Canada does not have a modern regime. What we have is effectively a long-term Band-Aid. Most of the waste storage is what is called Intermediate. The modern solution that we are going to be talking about is a Deep Geological Repository (DGR). Without getting overly technical, it is essentially putting waste in a very deep sealed hole below the water table and the technical experts have assessed that that's the best, safest option.

In our presentation, we are going to talk about:

- Barriers to why Canada doesn't have modern waste management solutions, and as I mentioned this is largely social.
- We are going to provide some recommendations as to how to get to a modern long-term radioactive waste management regime - so getting around those social issues; and
- Ultimately, we're going to outline and seek for your approval, an approach that sees engagement and outreach through a new organization to foster increased trust and social acceptance for Deep Geological Repositories in potential host communities and with Indigenous Peoples as well as they are impacted by this one.

Background

To understand where we are at with radioactive waste in Canada, we need to look at nuclear energy in Canada and how it has been managed over time.

Historically, there is no long-term solution in place for radioactive waste. The solutions that are currently implemented are what is dubbed an Intermediate. They were not intended to be long term. They are effective; they are not unsafe; they just do not meet the long-term goals in terms of having a permanent solution. Essentially, right now, waste is stockpiled at the various facilities across the country. At some point there will be a space limitation, lest we see ever expanding yards of nuclear waste.

The issue of nuclear waste is thus going to become more pressing over time.

The first point is that these active facilities, which is mainly power reactors, are going to continue producing waste over time.

The other issue is that the Government of Canada has committed to long-term net zero emissions goals for 2050. Now, currently, we know that there are not enough zero emission sources of energy in Canada to meet those goals, and so something will need to be brought in to fill the void. Nuclear seems a very viable option for this purpose. The only issue, of course, is that it generates waste. Over time, we will not only see the waste continue to be increased by these existing facilities, but if more nuclear is brought in to meet that net zero goals, that will also increase the waste load. So over time, the issue will become more pressing. It will also become more dispersed. With new facilities coming in, there will be new waste locations, so that needs to be addressed as well.

Getting back to the issue of waste.

We will need to have a permanent solution as we accrue more over time, and the Deep Geological Repository itself is the best, technical, internationally agreed upon option. The

International Atomic Energy Agency has spoken out in favor of the Deep Geological Repository option.

At this point, existing waste is not managed permanently because of social issues. There have been identified sites where a Deep Geological Repository could be hosted, but communities have been reluctant because of:

- Vocal resistance from environmental groups,
- General fears around nuclear energy and the potential safety risks of a deep geological repository; and
- Mistrust in the organisations that are providing information tied to nuclear energy.

Currently of note, the information is coming from the Nuclear Waste Management Organization (NWMO). This is the body that has been tasked with dealing with radioactive waste to date, and it is essentially an industry body with the government mantle. The principle being that industry would pay for to manage the waste that they were creating because they are benefiting from the creation of the waste in generating electricity and selling that electricity. The idea is philosophically sound, in that the individual generating the waste would be left than deal with it, but, as we will see, it's a little bit problematic in terms of generating trust.

Problem

There is a lack of social acceptance from potential host communities around Deep Geological Repositories. Simply put, nobody wants a dump in their backyard, particularly a dump of radioactive materials. Traditionally, that public reticence to accept the information provided by the nuclear industry has tied into this. Generally, when we talk about nuclear energy in the nuclear industry, we do not see the same reaction we did decades ago. Unfortunately, with disasters like Chernobyl and Fukushima Daiichi, there is an understandable mistrust in the public in information provided by industry in the nuclear energy sector.

Going back to the Nuclear Waste Management Organization.

Unfortunately, that leads us to a bit of natural distrust. The public already does not trust the industry because of past issues around nuclear energy. Now when we have industry interested with managing the waste and providing the information to the public, there's a bit of an apparent conflict of interest that the public sees - that this organization is an industry representation, even though it has a government mantle. It is acting in an apparent self interest, so that's very problematic for getting public buy-in. While it is a fair arrangement, it does not necessarily lead to people buying into the solutions that they are going to propose, in this case Deep Geological Repositories, because they are the key advocate pushing for it right now.

In terms of advancing the issue of DGRs, we would like to kind of advance three key thrusts. In order to meet environmental targets over time, we know that almost certainly nuclear energy will need to be part of the mix. At the same time, waste policy issues have largely been tied to social reluctance and not necessarily a technical issue. Therefore, if we do not build public trust and social acceptance for waste management we are going to be limited in terms of dealing with the current waste and our ability to rely on nuclear as a future energy source.

Considerations Overview

In terms of the considerations for developing means to get past this reluctance:

Currently we know that waste is stored in intermediate solutions, and that's problematic for the issues that we've already addressed. At the same time, moving forward, there's potential for more waste, so we need to address this. Social acceptance is critical for Canadians to implement the Deep Geologic Repository, which means we need a credible messenger.

In terms of an approach, other countries have dealt with this issue and have found that there are ways to deal with getting public acceptance and we will touch on those a little bit later.

What we will be outlining is that goal to get towards social acceptance and feeding into buy-in for Deep Geological Repository.

Considerations

Currently we know there are millions of fuel bundles in storage at sites across the country, and there are seven main ones. We know that that is not meant to be a permanent solution. At the same time, as we have indicated, that will only get worse over time. We need to resolve this issue, and we need to build trust to do so. In terms of building acceptance, that is the key to get DGR built.

Considerations Continued

In order to get a host community for Deep Geological Repository on board, we need to get the community to understand the information, accept what we're providing, and say that yes, we agree that this is safe. The reason that that has been an issue to date is because, as I've indicated, the information is coming from sources that communities don't trust. Even existing facilities have been pressured to close over time. There have been viable research sites in

Canada that may have been useful in exploring Deep Geological Repositories, but social acceptance was so low they were forced to close.

Because we know that the Nuclear Waste Management Organization has been tied into these efforts to date, we can safely assume that having messaging coming from a body which is largely composed of industry has not been successful. So perhaps, and what we would propose, would be that rather than focusing on selling the idea of the Deep Geological Repository to communities, we need to benefit from a modern approach that is consultive and sees engagement as a key part of this process, in which lies localized informed consultation with our potential host Community, nation to nation consultation with indigenous peoples, and driven by government, because again, we know that information coming from industry has not been successful to date. Having industry continuing to try to sell this solution does not seem a successful option. Having government step in would likely serve to abate some of these issues.

At the same time, we know that there are issues with community buy-in for government and regulators and regulatory capture.

Looking to other countries that have seen success, we know that independent advisory bodies have been successful in Finland, in particular. They have seen great success with the stand up of an advisory body to provide information to stakeholders around the safety of Deep Geological Repositories and also to provide advice on the disposal of nuclear waste. This would be an arms length organization, but it could represent a great option for removing that information delivery from either industry or the regulator and having a neutral third-party delivering information as a means to build trust and gain social acceptance for the information.

At the same time, those countries that have had success have seen that economic incentives can be very helpful in generating support for effective nuclear waste management. In Finland, obviously tax revenue was quite important, and Sweden saw investments and the creation of jobs as key. We know that traditionally in like models, these items are always key. Selling communities on anything akin to a dump usually does involve some sort of economic incentive as well.

Recommended Approach

To summarize, in order to get past the social reluctance to implement a Deep Geological Repository, we would propose a three-pronged approach that sees:

1. An independent advisory body set up to provide advice, information, and recommendations on the safe disposal of radioactive wastes. It is, therefore, seen as a neutral third party to give information about the safe disposal and could provide useful

information to communities about Deep Geological Repositories, without being seen to be part of industry and beholden to the need to work in self interests.

2. Government step in and take an active role in stakeholder engagement around Deep Geological Repositories rather than leaving it to the NWMO, which again, is largely seen as an industry body.
3. Using modern engagement approaches that also see engagement with indigenous communities on a nation-to-nation basis. This would also be something that would best be carried out by the government as the prime body that those communities would be working with.

This solution would provide the overarching drive that the Deep Geological Repository would be based on a mutually agreed upon decision rather than attempting to sell a given community on the hosting of the site. That is to say, modern engagement that is consultative and that responds to the interests and the concerns of a given community, rather than industry attempting to sell it.

Conclusion

In total we provided an outline there, but I will also note that those three prongs are not mutually exclusive. They can be carried about at the same time, and unfortunately, they are rather long term. It is a long-term process, but so is waste management on this particular issue. We are at the beginning of a long journey, but hopefully that might provide a means for us to move in the right direction and resolve some of these issues.

I will ask if you have any questions.