
JOINT ENGAGEMENT TABLE
MODERNIZING CANADA'S RADIOACTIVE WASTE POLICY
HOSTED BY NATURAL RESOURCES CANADA
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Questions for Discussion

Principles, Roles and Responsibilities	Minimization	Waste Storage Facilities
- What are your views on what should be included as the overarching principles of a radioactive waste policy? - Are there other principles central to the values of Canadians missing from the current Policy Framework? - Are the roles and responsibilities in the existing Policy Framework for Radioactive Waste clear, or should they be further elaborated? - What additional roles and responsibilities would you like to see, if any?	- What are your views on waste minimization? Should Canada continue to use the concept of the waste hierarchy? - What should be the role of government, the regulator and waste owners with respect to minimizing radioactive waste? - Are there other principles, beyond those identified by the International Atomic Energy Agency, that you feel are important to consider when designing and implementing a waste minimization program?	- What are your views on how radioactive waste is currently stored in Canada? - What should be the roles and responsibilities of government, the regulator, and waste owners with respect to radioactive waste storage?

Roundtable – Views and Perspectives (45 min)

- Each participant to share their views on what should be part of a modernized policy as it relates to the discussion topics (4 minutes per participant)

Canada's Radioactive Waste Policy Framework

- The federal government will ensure that radioactive waste disposal is carried out in a safe, environmentally sound, comprehensive, cost-effective and integrated manner.
- **The federal government has the responsibility to develop policy, to regulate, and to oversee producers and owners** to ensure that they comply with legal requirements and meet their funding and operational responsibilities **in accordance with approved waste disposal plans.**
- **The waste producers and owners are responsible, in accordance with the principle of "polluter pays", for the funding, organization, management and operation of disposal and other facilities required for their wastes.** This recognizes that arrangements may be different for nuclear fuel waste, low-level radioactive waste and uranium mine and mill tailings.

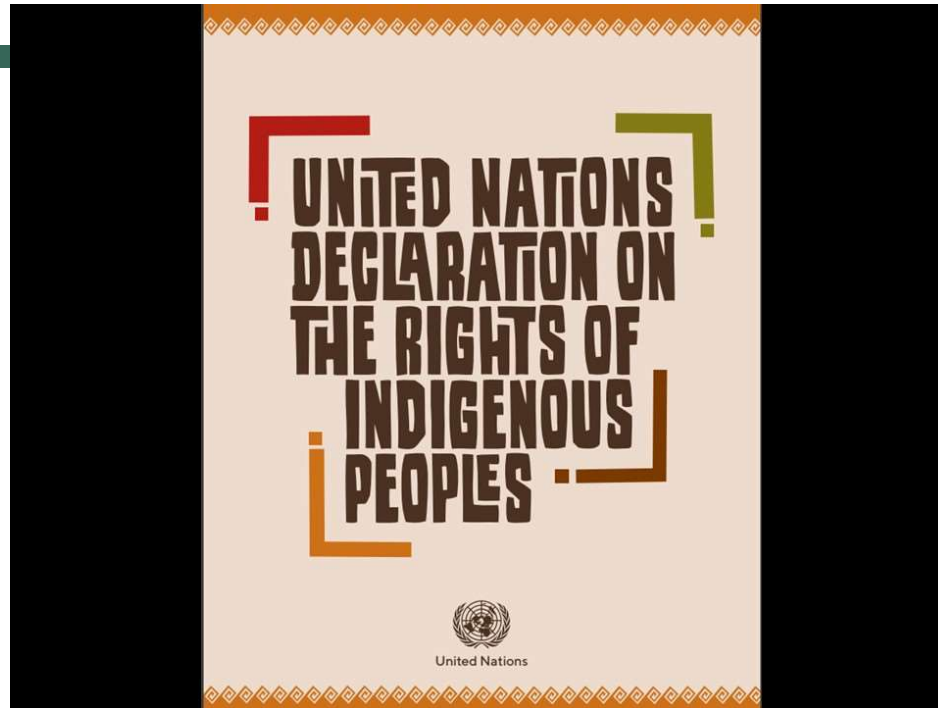
MISSING PRINCIPLES

- Transparency, openness and traceability
- Precautionary principle
- Community Right to Know
- Protection of human health and the environment
- Oversight and accountability
- Peace, Order and Good Government

Aarhus Convention

- the right to receive environmental information held by public authorities: **access to environmental information**
- the right to participate in environmental decision-making: **public participation in environmental decision-making**
- the right to review procedures to challenge public decisions that have been made without respecting the two aforementioned rights or environmental law in general: **access to justice**

The United Nations Economic Commission for Europe (UNECE) Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters was adopted on 25 June 1998 in the Danish city of Aarhus (Århus). The Aarhus Convention establishes a number of rights of the public (individuals and their associations) with regard to the environment.



Article 29

2. States shall take effective measures to ensure that no storage or disposal of hazardous materials shall take place in the lands or territories of indigenous peoples without their free, prior and informed consent.



ANISHINABEK NATION

Joint Declaration between the Anishinabek Nation and the Iroquois Caucus on the transport and abandonment of radioactive waste

No Abandonment: Radioactive waste materials... must be kept out of the food we eat, the water we drink, the air we breathe, and the land we live on for many generations to come.

Monitored and Retrievable Storage: Continuous guardianship of nuclear waste material is needed. This means long-term monitoring and retrievable storage.

Better Containment, More Packaging: The right kinds of packaging should be designed to make it easier to monitor, retrieve, and repackage insecure portions of the waste inventory as needed, for centuries to come.

Away from Major Water Bodies: Rivers and lakes are the blood and the lungs of Mother Earth. When we contaminate our waterways, we are poisoning life itself.

No Imports or Exports: The import and export of nuclear wastes over public roads and bridges should be forbidden except in truly exceptional cases after full consultation with all whose lands and waters are being put at risk.



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Waste Minimization

- ❖ A goal for waste minimization is to reduce the impact to the environment from nuclear energy or applications by reducing the final volumes and activity of waste that requires storage, and, ultimately, long-term disposal.
- ❖ The Canadian Nuclear Safety Commission (CNSC) requires that waste owners in Canada minimize the generation of radioactive waste to the extent practicable.
- ❖ Canada has adopted a set of guiding principles, referred to as the waste hierarchy, for minimizing waste, particularly from decommissioning activities.

What's Missing?

- Descriptions of current practices and operations in Canada that are only very generally referred to in the description of strategies but are not even explicitly identified, including incineration of low level radioactive waste, compaction, and export of radioactive wastes internationally for “processing” and the required repatriation of concentrations of those radioactive wastes
- Discussion of environmental and health effects and risks related to minimization practices, such as incineration
- Discussion of “Clearance” levels for radioactive wastes, and the relationship between clearance levels and the free release of radioactively contaminated materials into landfills and municipal water systems, including the policies and principles that seemingly allow these practices in Canada
- Policy implications of “recycling” or reprocessing of radioactive wastes, including as it relates to the potential contamination of metal streams, such as steel, and related concerns around security and proliferation in the case of recycling or reprocessing high level nuclear fuel waste
- Principles of protection of human health and the environment in relationship to preventing or mitigating the known or potential health and environmental impacts of radioactive waste reprocessing / recycling
- Linkages between this discussion paper and the decommissioning discussion paper, particularly related to clearance levels for the decommissioning of radioactive sites or clean up projects such as at Port Hope



I. What are your views on waste minimization? Should Canada continue to use the concept of the waste hierarchy?

- The first principle in waste management is waste avoidance – no more production.
- The waste hierarchy developed for other waste materials does not transfer onto management of radioactive wastes, given the radiological risk and the radiological contamination that occurs if radioactively contaminated materials were mixed with non-contaminated materials (for example, if radioactive contaminated steel were allowed to enter the commercial steel recycling waste stream)



2. What should be the role of government, regulator and waste owners with respect to minimizing radioactive waste?

- To achieve the first policy goal of waste avoidance the Government should adopt an energy policy that drives the phaseout of nuclear power, i.e. radioactive waste production.
- Energy companies, such as provincial utilities that currently operate nuclear reactors (i.e. radioactive waste generators) should shift in their supply options to clean energy sources, i.e. renewables.
- the interim, regulators should ensure that waste generators are carefully isolating and containing any radioactive waste generated, avoiding cross contamination and release to the environment.



3. Are there other principles, beyond those identified by the International Atomic Energy Agency, that you feel are important to consider when designing and implementing a waste minimization program?

- Additional IAEA principles include protection of human health and the environment, protection of future generations, avoiding burdens on future generations, and safety and control.
- The IAEA has also identified relevant objectives, including transparency, security, non-proliferation, continual improvement, and long-term commitment.
- As with all nuclear operations, the U.N. Declaration on the Rights of Indigenous Peoples must be applied.



KEY POLICY POINTS

- Prohibition on reprocessing irradiated fuel should continue
- The extraction of plutonium must be explicitly prohibited
- Practice of “free release” of radioactive materials should be discontinued
- Detailed tracking of all radioactive materials, including (very) low level radioactive wastes
- Waste characterizations and inventories must be detailed, current, and peer / public reviewed and accessible



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Waste Storage Facilities

- ❖ Radioactive waste requires interim storage until solutions for permanent disposal are in place.
- ❖ While storage can be long-term, it is not considered a permanent solution.
- ❖ In Canada, waste owners are responsible for the funding, organization, management and operation of disposal and other facilities required for their radioactive wastes.
- ❖ The key considerations when determining the type and location of storage facility for an operator's waste are based on domestic and international guidance, protection of human and environmental health, safety and security, and implementation of Canada's international commitments.

What's missing?

- Discussion of waste categories, classification, inventories, or volumes
- Information about the current practice of consolidating radioactive waste at centralized sites, such as the Western Waste Management Facility (WWMF) and Chalk River, and about radioactive waste transportation, which is necessitated by consolidation
- Acknowledgement of issues and failures with current radioactive waste storage systems,
- Discussion of environmental and health effects and risks related to current storage practices, such as:
 - the release of tritium to groundwater from storage systems at the Western Waste Management Facility;
 - the multiple failures of irradiated fuel bays at Pickering and Bruce,
 - the contamination of nuclear generating stations and uranium processing facilities
- Consideration of security risks and increased vulnerability due to non-hardened storage principles of protection of human health and the environment



I. What are your views on how radioactive waste is currently stored in Canada?

- A key issue with current storage practices is the lack of transparency and public access to information about design and performance of these systems.
- In general, storage systems have been constructed with the shortsighted assumption that they are temporary or interim, and their design have not been subject to public review and they have not maximized security



2. What should be the roles and responsibilities of government, the regulator, and waste owners with respect to radioactive waste storage?

- Government should establish an independent agency to oversee radioactive waste management, removing the policy function from the regulator.
- The regulator should demonstrate independence and apply regulatory standards developed through a public process and which are prescriptive and objective.
- The waste owners should fund the waste management systems, with public scrutiny, regulatory oversight, and detailed reporting



KEY POLICY POINTS

- Design, operations and monitoring for fuel waste storage systems should be open and transparent, and include public access to information
- Storage systems should be designed to minimize risk and maximize protection of human health and the environment
- Waste storage systems should be passively safe, should be “hardened” against extreme weather and malevolent acts, and should be dispersed across the site, at the point of generation

Questions from Discussion Papers

Decommissioning	Waste Disposal
- What do you feel are important policy considerations that should influence the choice of decommissioning strategies by nuclear operators and should be considered as part of Canada's radioactive waste policy? - In what ways should Canada's policy address the setting of end-state objectives for decommissioning?	- What do you feel are important policy considerations that should influence the choice of disposal approaches by waste owners and should be considered as part of Canada's radioactive waste policy? - What should be the roles and responsibilities of government, the regulator, and waste owners with regards to radioactive waste disposal facilities, including: - funding, - closure of a disposal facility and its institutional control, and - Indigenous and public engagement and involvement in site selection and post-closure?

Roundtable – Views and Perspectives (45 min)

- Each participant to share their views on what should be part of a modernized policy as it relates to the discussion topics (4 minutes per participant)

DECOMMISSIONING

Decommissioning

- What do you feel are important policy considerations that should influence the choice of decommissioning strategies by nuclear operators and should be considered as part of Canada's radioactive waste policy?
- In what ways should Canada's policy address the setting of end-state objectives for decommissioning?

What's Missing?

- Discussion of waste categories, classification, inventories in relationship to decommissioning options
- Analysis of shortcomings in the current decommissioning planning process, such as the absence of comprehensive descriptions of site conditions in preliminary decommissioning plans, lack of transparency
- Discussion of exposure risk, including to workers, during decommissioning phases



1. What do you feel are important policy considerations that should influence the choice of decommissioning strategies by nuclear operators and should be considered as part of Canada's radioactive waste policy?

- Decommissioning approaches must at minimum conform to international safety standards.
- Site conditions must be fully described, including a complete list of radionuclides found in soil, ground or surface water and/or involved in any radioactive decommissioning scenario
- Radioactive wastes on site and projected decommissioning wastes must be fully inventoried
- The list of radionuclides found on site and the inventories of radioactive wastes (on site and decommissioning wastes) must include half-lives, activities (total becquerels as well as becquerels per kilogram or per litre), mode of disintegration, radioactive progeny and target organs in human receptors
- Detailed descriptions of site conditions and the waste inventories must be developed and be publicly available and peer reviewed, including by the public and Indigenous peoples, at all decommissioning stages, including in the preliminary decommissioning planning stages
- Information and inventories related to decommissioning must be available and communicated to indigenous peoples and other members of the Canadian public, including in a plain language stripped of scientific symbols and abbreviations
- All decommissioning projects must include a comprehensive strategy for the transmission of Records, Knowledge and Memory (RK&M) to future generations, including a detailed inventory of all specific radionuclides included in the decommissioning wastes along with relevant physical, chemical and biological properties of each



2. In what ways should Canada's policy address the setting of end-state objectives for decommissioning?

■ End state objectives should be set in ecological and human health terms, not administrative terms. There should be measurable objectives for ground and surface water, soil and air, and these objectives should be developed by considering the pre-development state of the site (i.e. without radioactive and toxic contamination) and the protection of human health and the environment.



KEY POLICY POINTS

- Decommissioning approaches must at minimum conform to international safety standards.
- Decommissioning planning and implementation should be information based, including full information about the condition of the site (such as contamination of soil, ground or surface water) and a full inventory of radioactive wastes (on site and decommissioning wastes)
- Information must be publicly available and peer reviewed, including by the public and Indigenous peoples
- All decommissioning projects must include a comprehensive strategy for the transmission of information and knowledge to future generations
- End state objectives should be based on ecological and human health and the decommissioning work must show that the site has been fully remediated and is now fully safe

WASTE DISPOSAL

Waste Disposal

- What do you feel are important policy considerations that should influence the choice of disposal approaches by waste owners and should be considered as part of Canada's radioactive waste policy?
- What should be the roles and responsibilities of government, the regulator, and waste owners with regards to radioactive waste disposal facilities, including:
 - funding,
 - closure of a disposal facility and its institutional control, and
 - Indigenous and public engagement and involvement in site selection and post-closure?

What's Missing?

- Descriptions or even acknowledgement of the radiological and chemical hazards of different types or categories of radioactive waste
- Definitions of terms used which are fundamental to the paper, including “in situ” disposal and “institutional control”
- Discussion or acknowledgement of the conceptual nature and the large number of technical and scientific uncertainties associated with some of the options they list, such as borehole disposal or geological disposal
- Clarification as to when options generally considered to be storage options – such as vaults or silos – would be considered “disposal” options
- Sufficient definition to statements such as “environmental, social and economic factors may also need to be considered depending on the approach chosen” and what the role of science and social factors are in selecting sites and systems for “disposal”
- Discussion of the role of retrievability in a “disposal” option
- Analysis or links to analysis of current programs cited by the paper, such as the NWMO’s siting program for a deep geological repository for nuclear fuel waste or the Port Hope Area Initiative projects, both of which are problematic and are either still in the design / development stage or are in flux during implementation
- Examples of relevant policies from other countries, such as Scotland’s Proximity Principle which directs that radioactive waste is managed as close to the point of generation as possible, or France’s policy on retrievability which requires all “disposal” plans to include means of retrieving the wastes after placement



1. What do you feel are important policy considerations that should influence the choice of disposal approaches by waste owners and should be considered as part of Canada's radioactive waste policy?

- The notion presented of “disposal” should be replaced by an approach of long-term management. All management options – whether short, medium or long term – should be designed to accommodate detailed monitoring, measures of how the containment system is performing, and means to replace or remediate system failures (such as failed containers or barriers, or failures in monitoring systems). Transportation should be avoided or minimized, security of the wastes should be maximized, and the absolute containment of the wastes realized.



2. What should be the roles and responsibilities of government, the regulator, and waste owners with regards to radioactive waste disposal facilities, including:

- Funding,
 - Closure of a disposal facility and its institutional control, and Indigenous and Public Engagement and involvement in site selection and post-closure?
- Independence and transparency are the central principles in determining and defining roles and responsibilities. To meet these principles:
- An independent agency that is arms-length from government and industry should be established for the management of radioactive wastes
 - Independent scientific, technical and social advisory groups should be established to support the independent agency
 - A regulatory body which licenses nuclear facilities should report to Parliament through Environment Canada
 - Waste management should be funded by the waste owners and generators, but how the funds are used should be directed by the independent agency
 - Indigenous peoples and the public should be engaged in policy and project development and review, with funded access to legal and technical advisors and all relevant documentation



KEY POLICY POINTS

- The notion of “disposal” should be replaced by an approach of long-term care and stewardship
- Independence and transparency should be integrated throughout the radioactive waste policy
- Agencies responsible for radioactive waste research and oversight should be independent of the nuclear industry
- Canada’s nuclear regulator should report directly to parliament
- Indigenous peoples and the public should be engaged in policy and project development and review, with funded access to legal and technical advisors and all relevant documentation



Visit www.nuclearwastewatch.ca for more information about the review of Canada's radioactive waste policy.