



NUCLEAR WASTE  
MANAGEMENT  
ORGANIZATION

SOCIÉTÉ DE GESTION  
DES DÉCHETS  
NUCLÉAIRES

# Presentation to the All Party Group on Nuclear Energy

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# Our Mandate

- ❖ *Nuclear Fuel Waste Act (NFWA)* - November 15, 2002
  - Establishment of the NWMO and its independent Advisory Council
  - Waste owners to finance through segregated trust fund
- ❖ NWMO study to include, at a minimum, 3 specific technical methods for the long-term management of used nuclear fuel:
  - Deep geological disposal in the Canadian Shield (AECL Concept)
  - Storage at nuclear reactor sites
  - Centralized storage, either above or below ground
- ❖ For each approach, the study must include:
  - Detailed technical descriptions
  - Comparison of benefits, risks & costs
  - Ethical, social, economic and aboriginal considerations
  - Economic region for implementation (not site selection)
  - Implementation plan
- ❖ NWMO must consult with the general public & aboriginal peoples
- ❖ NWMO must submit its Study Report & Recommendations to Federal Government by November 15, 2005

# Governance

**Members:**

- 3 nuclear energy corporations
- Established the NWMO
- Finance the management approach

**Board of Directors:**

- 6 Directors, from nuclear energy corporations
- Provide oversight of the NWMO
- Approve annual business plans and budgets

**NWMO:**

- A not-for-profit corporation
- Studied the management options, led public engagement and will recommend a management approach to government
- Will become the implementing agency following a government decision on a management approach

**Advisory Council:**

- 9 members with range of social, scientific and technical expertise
- Examined and commented on NWMO study of management approaches
- Will examine and comment on NWMO's triennial reports
- Will provide ongoing source of counsel and guidance to NWMO

**Roundtable on Ethics:**

- 6 members, experts in the field of ethics from range of disciplines
- Advised NWMO throughout the study
- Assisted with integration of ethical considerations in the assessment framework used to compare options

# Current Status of Used Nuclear Fuel in Canada

## Nuclear Reactor Sites in Canada



# Current Status of Used Nuclear Fuel in Canada

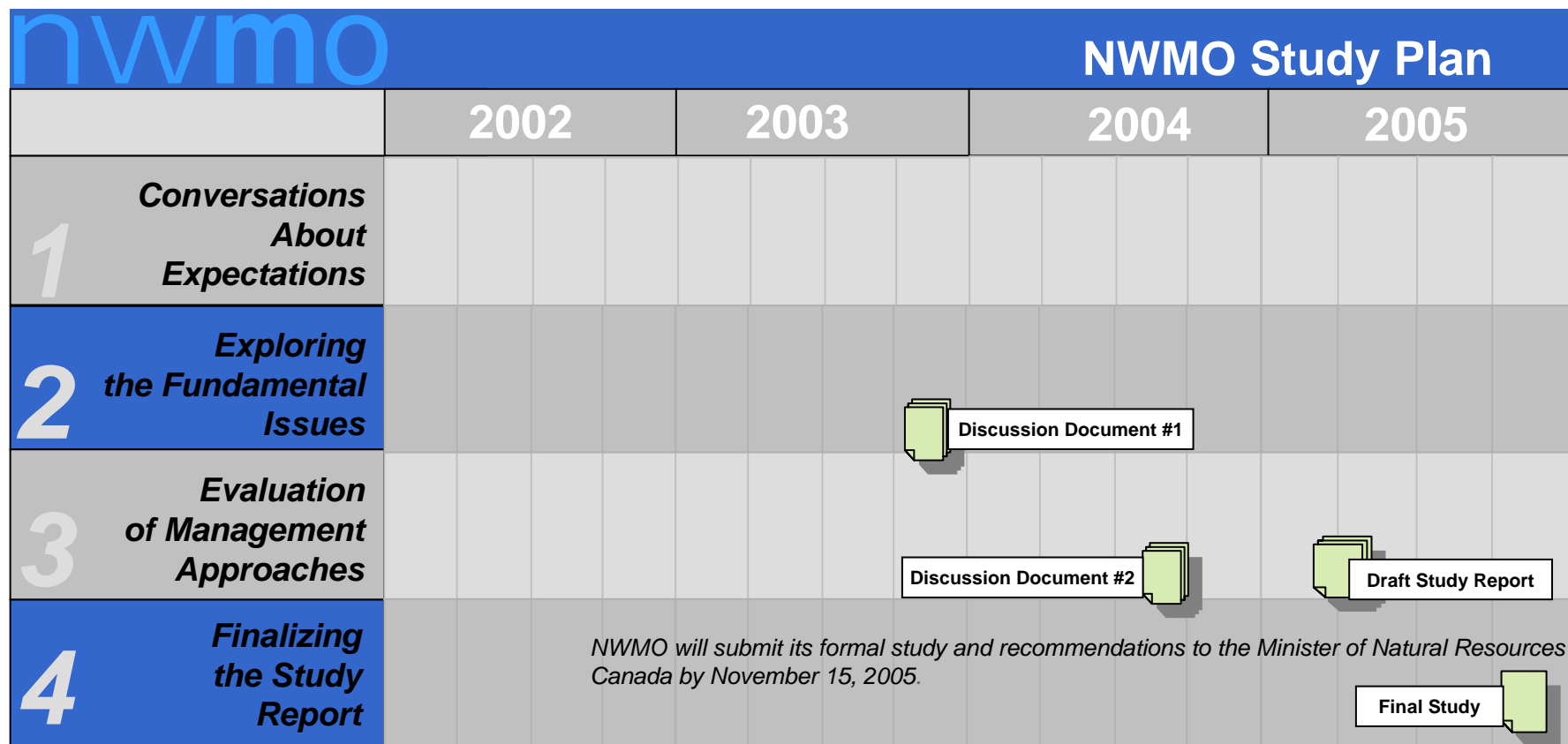
Company	Current Projected Inventory of Used Nuclear Fuel (to year-end 2005)		Projected Total Inventory of Used Nuclear Fuel	
	No. of Bundles	Tonnes Uranium	No. of Bundles	Tonnes Uranium
Ontario Power Generation Inc.	1,746,410	33,351	3,274,412	62,869
NB Power Nuclear	103,436	1,986	180,000	3,456
Hydro-Québec	99,245	1,906	180,000	3,456
Atomic Energy of Canada Ltd.	30,682	589	30,682	589
<b>Total</b>	<b>1,979,773</b>	<b>38,012</b>	<b>3,665,094</b>	<b>70,370</b>

# NWMO Mission Statement

To develop collaboratively with Canadians a management approach for the long-term care of Canada's used nuclear fuel that is

- ❖ socially acceptable,
- ❖ technically sound,
- ❖ environmentally responsible, and
- ❖ economically feasible.

# Phases of NWMO Study Plan & Milestone Documents



# Engagement with Canadians



- ❖ More than 18,000 citizens contributed to study, through dialogues, meetings, workshops, submissions (including more than 500 specialists)
- ❖ About 50,000 individuals visited NWMO website.

# Inputs for the Assessment

## 10 QUESTIONS

### Institutions & Governance

Does the management approach have a foundation of rules, incentives, programs and capacities that ensure all operational consequences will be addressed for many years to come?

### Engagement and Participation in Decision-making

Does the management approach provide for deliberate and full public engagement through different phases of the implementation?

### Aboriginal Values

Have Aboriginal perspectives and insights informed the direction, and influenced the development of the management approach?

### Ethical Considerations

Is the process for selecting, assessing and implementing the management approach one that is fair and equitable to our generation and future generations?

### Synthesis and Continuous Learning

When considered together, do the different components of the assessment suggest that the management approach will contribute to an overall improvement in human and ecosystem well-being over the long term? Is there provision for continuous learning?

### Human Health, Safety, and Well-being

Does the management approach ensure that people's health, safety and well-being are maintained (or improved) now and over the long term?

### Security

Does this method of dealing with used nuclear fuel adequately contribute to human security? Will the management approach result in reduced access to nuclear materials by terrorists or other unauthorized agents?

### Environmental Integrity

Does the management approach ensure the long-term integrity of the environment?

### Economic Viability

Is the economic viability of the management approach assured and will the economy of the community (and future communities) be maintained or improved as a result?

### Technical Adequacy

Is the technical adequacy of the management approach assured and are design, construction and implementation of the method(s) used in the management approach based on the best available technical and scientific insight? By method, we mean the technical method of storage or disposal of the used fuel.

## ETHICAL AND SOCIAL FRAMEWORK

- Citizen and Aboriginal values and concerns
- Ethical principles
- Future scenarios
- Societal context

## ANALYSIS

### Key Objectives

Fairness  
Public Health and Safety  
Worker Health and Safety  
Community Well-being  
Security  
Environmental Integrity  
Economic Viability  
Adaptability of the Approach

## TECHNICAL INFORMATION

- Background papers
- Engineering designs and cost estimates

- ❖ NWMO recommending a Fourth Option: **Adaptive Phased Management** consisting of two components:
  - A technical method:
    - Ultimate centralized containment and isolation of used nuclear fuel in an appropriate geological formation
    - Optional shallow storage at the central site prior to placement in the repository
  - A management system:
    - Phased and adaptive decision-making
    - Continuous monitoring
    - Provision for retrievability
    - Citizen engagement
- ❖ Builds on features of other three options & implements in a staged manner

# A Responsive and Responsible Path

- ❖ Commits this generation of Canadians to take the first steps
- ❖ Requires meeting/exceeding rigorous safety & security standards
- ❖ Allows sequential decision-making & provides genuine choice
- ❖ Builds in flexibility to adapt to experience & societal change
- ❖ Promotes continuous learning
- ❖ Provides viable, safe and secure long-term storage capability, with potential for retrievability of used fuel, until future generations have confidence to close the facility
- ❖ Rooted in values & ethics, engages citizens, allow for societal judgments – e.g., is there sufficient certainty to proceed with each step

# Foundation for Implementation

- ❖ Process of implementation key to effectiveness of any management approach
- ❖ Very long time-frame of implementation (many decades)
  - Must seek to continue to respond to societal needs and concerns
  - Opportunity to be responsive to continuous learning, new developments in science and technology, institutions, values, Aboriginal knowledge, political perspectives, and economic and financial considerations
- ❖ Implementation plans will be designed with communities of interest who have a role to play
- ❖ Phased decision-making – allows each step of implementation to be informed by research and public input

# Governance and Institutions

- ❖ Federal Government - makes decision on a management approach
- ❖ NWMO - implementing agency (Board, Advisory Council)
  - Advisory Council comments to Minister of Natural Resources Canada on NWMO triennial reports, 5-year plans
- ❖ Waste owners - set up trust funds to finance the approach
- ❖ Canada has extensive system of governance to oversee sequence of implementation decisions:
  - Natural Resources Canada - oversees NWMO, reviews annual reports, approves funding formula, tables NWMO reports in Parliament
  - Canadian Nuclear Safety Commission – protects health, safety, security & environment through licensing, compliance and enforcement
  - International obligations – safeguards and safety conventions
  - Canadian Environmental Assessment Act – environmental effects
  - Transport Canada – enforces safety requirements for transport
  - Provincial regulations / Municipal requirements – siting, operations
  - Communities, Aboriginal Organizations – active participation

# Citizen Engagement

- ❖ Engagement activities will support each step of decision-making
  - NWMO seeks to continue real dialogue with the public and Aboriginal Peoples, listening and learning
- ❖ People will have the opportunity to influence decisions
- ❖ Concerns of interested citizens in regions and communities directly and indirectly affected will be incorporated to resolve issues and problems
- ❖ Sufficient resources and information provided to ensure the capacity to participate in discussions and decision-making, including monitoring
- ❖ Potential risks and the means to manage them, including transportation, must be understood as basis for active participation

# Financing

- ❖ Cost estimates identified for each phase of implementation
- ❖ Planning conservatively -- setting aside money to support flexibility - ensure future generations have genuine choice in implementation, contingency provisions for unexpected events
- ❖ Extensive legislative and regulatory oversight for financial surety:
  - Waste producers required to set up trust funds to cover full cost of implementation (under “polluter pays” principle)
  - Waste producers cost-share according to funding formula
  - Restricted access to trust funds - provides security
  - Financial guarantees, nuclear liability and insurance provided for
  - Ongoing reviews of total cost and associated funding requirements (funding formula subject to Minister’s oversight and approval)

# Siting Process

Guided by ethical and technical principles considerations

- ❖ Willing host community will be sought
- ❖ Fairness best achieved by focusing on 4 provinces directly involved in nuclear fuel cycle
- ❖ Communities, regions and other provinces may come forward
- ❖ Open, transparent process
- ❖ Groups most likely to be affected will be given full opportunity to engage and be heard
- ❖ Assess costs, benefits and risks, and social and cultural impacts
- ❖ Decisions informed by natural science, social science, Aboriginal knowledge, ethics
- ❖ Site must meet social, scientific, technical and licensing requirements

# Addressing Social, Economic & Cultural Effects

NWMO believes implementation must:

- ❖ Respect and support a host community's vision for its social, cultural and economic aspirations
- ❖ Seek to foster positive, sustained social change
- ❖ Avoid or minimize disruptive impact on communities
- ❖ Recognize contributions and costs borne by the community through appropriate mitigation measures
- ❖ Follow decisions taken in collaboration with the community, to align with community's vision for future

# Research and Intellectual Capacity

Emphasis on continuous learning to support decisions and operations – a key feature of Adaptive Phased Management:

- ❖ Social streams of research to guide decision-making, incorporate Traditional Knowledge, community well-being
- ❖ Technical research and monitoring to inform decisions on siting, design, environmental approvals, licensing and operations
- ❖ Monitoring of emerging research internationally
- ❖ Research plays important role:
  - Enhancing social and scientific understanding, opportunity for improvements
  - Reducing uncertainty, demonstrating and confirming performance
  - Providing confidence to take each subsequent step in implementation
- ❖ Maintenance of skills and capacities of workers to manage the program through the phases.

# Next Steps

- ❖ Submission of Final Study to Minister of Natural Resources Canada, by November 15, 2005
- ❖ Final Study will be made public at the same time (posted on NWMO website, mailings to key stakeholders)
- ❖ Decision to be taken by Governor in Council

NWMO will continue its operations and initiate implementation following a government decision on a management approach.