The future of radioactive waste governance: Lessons from Europe

Rinie van Est & Maarten Arentsen Rathenau Instituut, The Hague, The Netherlands

> Reform meeting 25 October 3-7 2022

Background: Why this edited volume?

- Assignment Rathenau Instituut:
- Advising on a <u>society approved</u> decision making proces about long term management of radioactive waste by means of <u>research and</u> <u>dialogue</u> between stakeholders, experts and citizens.
- Components of research:
 - The governance in past, present, future and "elsewhere"
- "Elsewhere" is addressed by the edited volume

Starting point: State of the art on governance

RESEARCH

Energiepolitik und Klimaschutz Energy Policy and Climate Protection

Achim Brunnengräber - Maria Rosaria Di Nucci Ana María Isidoro Losada - Lutz Mez Miranda A. Schreurs *Editors*

Nuclear Waste Governance

An International Comparison

Energiepolitik und Klimaschutz Energy Policy and Climate Protection Achim Brunnengräber - Maria Rosaria Di Nucci Ana María Isidoro Losada - Lutz Mez Miranda A. Schreurs *Editors*

Challenges of Nuclear Waste Governance

An International Comparison Volume II

Springer VS

Energiepolitik und Klimaschutz Energy Policy and Climate Protection

Achim Brunnengräber Maria Rosaria Di Nucci *Editors*

Conflicts, Participation and Acceptability in Nuclear Waste Governance

RESEARCH

An International Comparison Volume III Bettina Brohmann, Achim Brunnengräber, Peter Hocke, Ana María Isidoro Losada (Hg.) 1 va

Robuste Langzeit-Governance bei der Endlagersuche

Soziotechnische Herausforderungen im Umgang mit hochradioaktiven Abfällen

D Springer VS

RESEARCH

Observations:

- Widespread societal resistance
- A highly challenging problem
- A reconsideration of national governance approaches:
 - From:
 - expert-dominated top-down governance with decide-announce-defend (DAD) communication strategy
 - To:
 - engage-deliberate-decide (EDD) communication strategy
 - a 'participatory turn' in RWM governance strategy (Bergmans et al, 2014)

A challenging problem: RWM is socio-technical "Wicked" problem (Brunnnengräber, 2019) 1/2

- Nature of the problem:
 - Not only facts play a role, but also <u>changing narratives</u> (visions, values and expectations)
 - Not only technical, but basically <u>sociotechnical problem</u> without blueprint of solutions
 - A double jeopardy situation: Safety requires security, but raises security concerns
 - Systemic risks involved arising from the interaction between technology, politics, society and economics
 - Vast time scales involved

A challenging problem RWM is socio-technical "Wicked" problem (Brunnnengräber, 2019) 2/2

- On the governance of the problem:
 - A <u>country specific</u> national governance approach (political, social and cultural country background)
 - A <u>multi-level governance challenge</u> (embedded in supranational to local institutions)
 - Wide spectrum of actors involved: a <u>landscape of conflicting actors</u>
 - Inter- and transdisciplinary research required: crossing boundaries of different scientific fields.
 - Radioactive waste governance forms a democratic challenge and is about "reshaping state authority, a shift in responsibility and the integration of civilian knowledge and experience"

Central question:

• What lessons do the country studies teach us about the governance of long-term RWM?

Analytical perspective

Kool et al., 2017

Governance ecosystem



International	
European Union	
National	
Regional	
Local	

Content

Chapter 1 Introduction: The governance challenge of radioactive waste management

Rinie van Est, Maarten Arentsen & Romy Dekker

Chapter 2 Long-term radioactive waste management in the Netherlands: Seeking guidance for decision-making

Romy Dekker, Vincent Lagendijk, Roos Walstock, Rinie van Est

Chapter 3 Nuclear Waste Governance in Italy: between participation rhetoric and regionalism

Maria Rosaria Di Nucci and Andrea Prontera

Chapter 4 Do you care about High-level Radioactive Waste and Spent Nuclear Fuel? Opportunities for co-constructing an appropriate governance-ecosystem in Belgium

Anne Bergmans, Catherine Fallon, Ron Cörvers, Céline Parotte

Chapter 5 The long road towards the soft nuclear repository state

Nuclear waste governance in Germany

Maria Rosaria Di Nucci and Achim Brunnengräber

Chapter 6 The melancholic lock. High-Level Radioactive Waste Governance in Spain

Josep Espluga-Trenc & Ana Prades

Chapter 7 Who Decides What is Safe? Experiences from Radioactive Waste Governance in Switzerland

Sophie Kuppler, Anne Eckhardt, Peter Hocke

Chapter 8 UK nuclear waste policy: 50 wasted years

Steve Thomas

Chapter 9 The governance ecosystem of radioactive waste management in France: governing of and with mistrust

Markku Lehtonen

Chapter 10 Radioactive waste management in Sweden: Decision making in a context of scientific controversy

Johan Swahn

Chapter 11 The Finnish solution to final disposal of spent nuclear fuel

Jarmo Vehmas, Aleksis Rentto, Jyrki Luukkanen, Burkhard Auffermann, Jari Kaivo-oja

Chapter 12 European lessons for governance of long-term radioactive waste management

Rinie van Est & Maarten Arentsen

On participatory turn in RWM governance

- Lesson 1: RWM governance currently tries to experimentally shape the participatory turn
 - a paradigm shift in the relationship between civil society and the scientific and technological and political-administrative domains.
 - From decide-announce-defend (DAD) strategy towards an engage-deliberatedecide (EDD) strategy in country-wide real-life experiments.

On RWM in the context of nuclear energy

- Lesson 2: RWM governance is affected by planned and unplanned nuclear energy developments
 - Waste problem "solved" = more nuclear energy (Finland)
 - Waste problem not "solved" = no new nuclear (Spain)
 - Legacy waste versus new waste (UK)
 - Nuclear disaster and phasing out nuclear (Germany)
 - Nuclear disaster and public opinion on nuclear (Sweden, Italy)
 - Ukraine war puts nuclear on the agenda again (Netherlands)

On RWM as a multi-level governance phenomenon

- Lesson 3: The interaction between <u>international and national levels</u> regarding nuclear safety and radiological protection is well-coordinated and institutionally embedded (all countries)
- Lesson 4: The option of a <u>multinational geological waste disposal facility</u> is seriously considered and explored (It, DK, B and NL).
- Lesson 5: There is a need to achieve <u>more coordinated interaction between</u> <u>national, regional and local levels</u> (Spain versus Switzerland)
- Lesson 6: <u>Reliability and validity of research on technological safety and risks</u> play a central role in the siting process for a geological disposal facility (credibility of science)
- Lesson 7: A siting process for a geological disposal facility raises the question to what extent it <u>fits in with local development visions</u> (fit with local development plans: areas with and without nuclear background, local voluntarism (Fin, SP, UK, It)

NL

- 1) minimisation of the generation of radioactive waste;
- 2) safe management of radioactive waste;
- no unreasonable burdens on the shoulders of future generations;
- 4) the producers of radioactive waste are responsible for the costs of its management.

BE

- 1) a flexible and stepwise approach,
- 2) practicing transparency,
- 3) providing clarity about the link between participation and decision-making,
- 4) ensuring monitoring and control, and
- 5) robust financing.

On laws and regulations: Creating a legal basis for decision-making around RWM options

- Lesson 10: It is important to anchor policy principles and technological options in law
 - Codification of societal and political learning and agreement
 - Examples: France, retrievability; in Germany, the retrieval period; and in Belgium and Finland, passive safety.
 - Italy: 15 criteria for site selection
- Lesson 11: It is important to legally underpin decision-making procedures
 - Example Switzerland's Sectoral Plan for Deep Geological Repositories of 2008 arranging the process of finding locations for the final disposal of LLW, ILW, and HLW. Three phases:
 - Phase 1: selection of suitable geological areas
 - Phase 2: at least two potential siting areas for LLW, ILW and HLW or one site for a combined repository proposed with proper public participation
 - Phase 3: nomination of two disposal sites or the site for a combined repository planned and to be approved by parliament and the electorate in 2031 at the latest.

On science and technology domain: Towards an institutionally diverse knowledge landscape

- Lesson 12: It is important to be transparent about and openly debate scientific uncertainties about suitable RWM methods and geological formations, as knowledge development is dynamic
- Lesson 13: The policy principle of retrievability implies a significantly longer period of active safety before moving on to passive safety
- Lesson 14: There is a need for interdisciplinary and transdisciplinary knowledge, and social science can play a central role in this
- Lesson 15: There is a need for the institutional distribution of knowledge

On Civil society: The challenge of informing and engaging civil society

- Lesson 16. There is a need for joint production of socially robust knowledge
- Lesson 17: There is a need to clarify and enhance the role of societal engagement in various steps of the political decision-making process

Maarten Arentsen Rinie van Est (Editors)

A big thank you to all contributing authors

The future of radioactive waste governance: Lessons from Europe

D Springer VS