

Restitution

Session 1 - Climate change impacts on society: How may it influence RWM policy and governance?

EURAD-2 Annual breakout sessions

Zoe Emory, KTH
Alexis Geisler-Roblin, NTW



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Issues of the session and programme

How to collectively address three constitutive elements of the session ?

- 1/ Climate change impact
- 2/ Societal perspective and engagement in nuclear
- 3/ Radioactive Waste Management

Regarding the links between 1/ and 2/ we had two speakers :

- Yves Lheureux, ANCCLI direction (national level)
- Kévin Denizet, chargé de mission at CLI de Golfech (south of France)

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Climate change & nuclear power

5 messages

1. Local questions,
2. safety-environment links,
3. the 5th 900 MWe periodic safety review,
4. and operation beyond 60 years.

Dialogue

Water

Safety

Today, the aim is not to oppose climate and nuclear power, but to ask the right questions : how facilities adapt, how local areas are involved, and which criteria should guide public decision-making.



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Public meeting 2024 “Climate change and nuclear powerplant adaptation”



COMMUNICATION

- Promotional video shared on social media
- Invitations sent to all our members

RESULTS

218 attendees: members of the public, CLI members, elected representatives, experts and other stakeholders

WAS IT THE FIRST TIME ?

No. We first addressed climate change in 2022, with a focus on the Garonne River.



Interactive Activity: PEP A dialogue-based Process to Evaluate strategic Pathways for radioactive waste management

How to collectively address three constitutive elements of the session ?

- 1/ Climate change impact
- 2/ Societal perspective and engagement in nuclear
- 3/ Radioactive Waste Management

⇒ 17
scenarios
tackled over
5 tables



PEP SCENARIOS DISCUSSED BY THE GROUP

Event	Evaluate	Temporal position	Short description
E3 Extreme events with increased frequency and intensity	X4 Robustness of the system	Surface facility existing now	Robustness of facilities over extreme climate events (even mixture of them)
E9 Geopolitical stress	X4 Robustness of the system	Facility exists but nothing is planned	Geopolitical instability due to climate change consequences
E5 Rising sea level	X4 Robustness of the system	Before closure	Sub-surface facility
E6 Time pressure and delays	Y2 Institutional capability & stability	now	Spent fuel should be sent to la Hague but obsolescence leads to delays

PEP SCENARIOS DISCUSSED BY THE GROUP

Event	Evaluate	Temporal position	Short description
E6 time pressure and delays	X3 : Resilience and abandonment risk	Before geological disposal	Sudden risk of abandonment because of delays
E5 rising sea level	X1 : Managing risks proactively	Short term	If the repository is near the coast, how to manage ?
E7 Operational malfunction	X1 : Managing risks proactively / Y1 : Involving publics	Now	Like in Spain few years ago, black out and power outage

PEP SCENARIOS DISCUSSED BY THE GROUP

Event	Evaluate	Temporal position	Short description
E6 time pressure and delays	Y2 Institutional capability & stability	In 25 years	The schedule for the construction and commissioning of the DGR has been finalized (dates, milestones). It is enshrined in law. With climate change, we need to adapt as we go along. How can we make the right decisions within a predetermined pathway? How can we adapt a project that is already on track?
E1 Erosion and hydrogeological risk increase	X4 Robustness of the system	DGR operation phase	More rain, more erosion, more flooding Where is the balance between redundant barriers and rising costs? At what point can we say it's "safe enough"?
E2 Climate Runaway effect	Y1 Involving the public	After construction of the disposals	AMOC shut down. Winter with -20°C. How can we continue to involve civil society in nuclear waste management when so many aspects of their lives are affected by climate change?

PEP SCENARIOS DISCUSSED BY THE GROUP

Event	Evaluate	Temporal position	Short description
E9 – Geopolitical stress	[X1 – Managing risks proactively Y2 – Institutional capability & stability]	Now	Real example: attack of Russian drone on RWM infrastructure (ex. : Chernobyl dome)
E5 – Rising sea level	[X3 – Resilience and abandonment risk]	During construction	Half-way dug repository faces severe floodings. What to do?
E1 – Erosion and hydrogeological risk increase		Operational phase	Severe drought: no water to cool waste in interim storage.

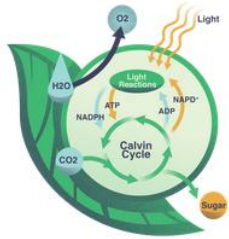
[participants did not use evaluate cards. I just added the ones that reflect best the topics tackled during discussion]

To note : the group took a different route by having more than 1 evaluation per scenario to have a well-rounded proposals of solutions.

PEP SCENARIOS DISCUSSED BY THE GROUP

Event	Evaluate	Temporal position	Short description
E1 : Erosion & hydrological risks increase	X4 -Robustness of the system Y1 – Involving the public	Op phase	- Important in the international level waste scenario, including the short-term and operational phase - Fundamental to involve the public in the problem _ continuous monitoring helps in information sharing
E3 : Extreme events with increased frequency and intensity	X4 -Robustness of the system Y2 -Institutional capability & stability	Op phase	- Need to plan and have good policies in place to afford flexibility in resource allocation - Most significant: short to medium term (operational) - Knowledge management and transfer for future generations
E8 : Impacts on humanity and habitability	Y2 -Institutional capability & stability Z2 –Managing uncertainty ethically	Op phase	- Involving public; communicating > transparency > institutions managing uncertainties ethically and responsibly - Bonus : X4 Cultural and Spiritual dimensions for habitability
E7 : Operational Malfunction	X4 -Robustness of the system Y5 –Public Transparency Z2 –Managing uncertainty ethically	Op phase	- Need a robust concept to address FEPs and how those uncertainties are handled - Transparent; what are we doing now? And what are we not that we should?

4 main questions to be answered during the round of evaluation



A. Climate processes: Which climate processes concerned you the most in terms of impacts on RWM?



B. Safety issues: Which aspects of RWM seem most vulnerable to climate change regarding safety issues?



C. Reduction of CC impact on RWM: How can we improve the reduction of CC impact on RWM?



D. PEP experience: What struck you the most ?



DEBRIEFING QUESTIONS

A – Climate Change processes

- Geopolitical Strategies
- Extreme events

B – Safety issues

- Near and sub-surface level repositories should be prioritised regarding CC impact

C – Reduction of CC impact on RWM infrastructure

- Robustness of the system; resilient and adaptable approach
- How politics and its changing landscape affects policy.

D – PEP experience

- Realised geopolitical aspect for RWM is central
- Surprised by group reaching consensus quickly

DEBRIEFING QUESTIONS: What was discussed

A – Climate Change processes: Most concerning

- Flooding
- Sea level rise / Salt water start intrusion
- Aridity/Heat waves
- AMOC collapse
- Hydrogeological change
- Wildfires
- Geopolitical Strategies
- Extreme events

B – Safety issues: Most vulnerable

- Containment breach, water intrusion
- Operational malfunction
- Loss of cooling capacity
- War situation / Political instability
- Accessibility of sub-surface & surface disposal facilities leads to vulnerability
- Increased security risk during operational phase
- Near and sub-surface level repositories should be prioritised regarding CC impact

C – Reduction of climate change impact on RWM infrastructure: Improvement

- **Plan for it**
- Apply consistent mitigation and adaptation measures globally
 - Managing risk proactively
 - Institutional capability and stability
 - Planning all potential scenario
 - Monitoring processing
 - Involving civil society in design & operational phase
- Policy change/update according to new challenges
- Robustness of the system; resilient and adaptable approach
- How politics and its changing landscape affects policy.

The PEP Experience: Participant Reflections

Positive takeaways

- Good ice breaker
- **Good for discussion and team work**
- Allows everyone to speak
- **Worked well and helped with discussion**
- Good way to discuss with people from different backgrounds and expertise
- Allows for **meaningful discussion** of different scenarios in a short time
- A great way to explore potential impacts of climate change
- Sharing from different countries experience, provides perspective
- Discuss can be very broad: Effect and indirect effect of climate change
- Cases specifically designed for this scenario → wow!
- Nice connection to real situations
- Found similar issues in countries with similar waste
- Realised geopolitical aspect for RWM is central
- Surprised by group reaching consensus quickly

Challenges

- Too theoretical
- Slightly confusing + unclear in the beginning
- It takes some time to understand the game
- Cards are too detailed given the time. Pictures would be enough + too many cards
- Discussions depends on the level of expertise of participants
- Difficult not to start debating