

## WM2024 Conference Report

**PANEL SESSION 116:**           **Collaboration between EU Waste Management Projects with Other International Groups, Tuesday March 12 at 3:20-5:00 pm, room 224 A**

**Co-Chairs:**                   **Anthony Banford, UK National Nuclear Laboratory (United Kingdom)**  
**Erika Holt, VTT Technical Research Centre of Finland (Finland)**

**Panel Reporter:**           **Nadezhda Gotcheva, VTT Technical Research Centre of Finland (Finland)**

### Panelists:

1. **Erika Holt**, *Customer Account Lead, Project Manager, VTT Technical Research Centre of Finland (Finland)*
2. **Christophe Bruggeman**, *Deputy Director-General, Belgian Nuclear Research Center SCK CEN (Belgium)*
3. **Rebecca Robbins**, *Predisposal Team Leader, IAEA (Austria)*
4. **David Sassani**, *Distinguished Member of Technical Staff, Sandia National Laboratories (United States)*
5. **Jess McWilliams**, *PhD Student, University of Sheffield (United Kingdom)*

This session focused on case studies given from the ongoing PREDIS project on innovative solutions for predisposal waste management, which has engaged with international parties outside of Europe. The discussion was focused on how North American and other international stakeholders can benefit from collaboration with the European Union R&D projects funded by Euratom. Panelists shared about the future Strategic Research and Knowledge Management Agendas of the Euratom waste management programs, including EURAD-1 and PREDIS. Information was shared about the future EURAD-2 joint partnership proposal (55+ M€ budget, 2024-2029), where collaboration plans are developed with various USA, Canadian and other international institutes.

**Erika Holt** presented the PREDIS project, which has run for the past 4 years, and is currently in the last 6 months, focused on predisposal waste management. The project consists of 47 partners and 25 end users. Emphasis is on improving technologies, concrete packages, digitalization, and wireless monitoring.

**Christophe Bruggeman** presented the EURAD project. It is a 5-year project, started in 2019. The EC, which provides 50 per cent of the funding, asked all the key players to come up with a strategic research agenda, to develop a roadmap and create capacity for multinational cooperation. There are 17 work packages and knowledge management is highlighted as especially important due to retirements of experienced workers. International partners from Australia, Canada and Japan are also involved. The Strategic Research Agenda (SRA) is a key document that is underlying the strategy in EURAD-2 project. Six topics have been identified as drivers of the SRA: implementation safety, tailored solutions, scientific insight, innovation for optimization, societal engagement, and knowledge management. The EURAD Roadmap was also developed.

**Erika Holt** presented the new EURAD-2 partnership scope, which includes both Predisposal and Disposal topics. The topics that need to be studied will be clarified in the coming year; based on the same foundation principles and SRAs, the focus is on technical R&D. The SRA roadmap themes are as follows: Programme Management, Predisposal, EBS, Geoscience, Optimization, Safety Case. Erika highlighted that the wider reach is needed to prioritize and work together on these topics.

**Rebecca Robbins** indicated that role of IAEA in the waste management area is to provide overview of good practices, to collect relevant knowledge and disseminate it. During Covid IAEA teamed up with the PREDIS and EURAD projects. The waste management challenges of different EU countries are very diverse. The Agency is issuing guidance documents.

**Jess McWilliams** highlighted the benefits of being part of these EU projects during her PhD studies. PREDIS offered many webinars and workshops for students, tours, visits to sites, and these are very valuable to PhD researchers.

**David Sassani** informed that Sandia National Laboratories are involved in EURAD-2, and actively connected to the EURAD and PREDIS projects. US and EU projects collaboration is more than the sum of its parts. Benefits and synergies

stem from different thought processes, interfaces, exchange of information, co-writing of reports and articles. **Erika Holt** added that the biggest challenges are high level waste, and for this area collaboration with US labs is very beneficial for all parties. She clarified further that the project is also open to other parties with in-kind contribution and subject to a partnership agreement.

In conclusion, the Panel members emphasized that a key aspect of these EU projects is integration of different actors, all working together for a common goal; research organizations can better see what they are doing, and how it fits to the bigger whole, while responding to topical industry needs or/and regulatory challenges. It is important to avoid silos when dealing with different aspects of waste management. **Anthony Banford** opened the floor to the audience.

## Questions, Answers and Discussion

1. *A question was raised about the organization of participation to EURAD-2: does the participation continue from EURAD-1/PREDIS or do you involve new members and participants?* The Panel members responded that all European members states were asked to identify their beneficiaries for EURAD 1. For EURAD-2, continuation is combined with new mandates to involve new actors - new organizations are encouraged to join. The associated partners are the points of contact if someone wants to enter the project; it needs to be formalized. Since the work packages are different, this gives new opportunities. In PREDIS, one-third of partners were new because there were new topics, such as digital twins. The impact of climate change also brings need for new expertise. Regarding SMRs and waste, many countries are exploring this topic individually but there is a need to identify and tackle together the main challenges.
2. *Discussion topic: what are the best ways for stakeholders to get involved or give their feedback to the EC projects?* The Panel members noted that these projects are funded with public money, and there is an obligation for transparency and outreach by regular posts on the webpage, publication of state-of-the-art documents which are also beneficial for the wider communities; outreach activities, webinars, training etc. are open to everyone. *From the IAEA perspective*, the Agency acts as a proxy for the end users around the world, having a key role in identifying gaps and providing guidance, therefore the transparency in these EC projects is greatly appreciated. *From the US DoE perspective*, active connections and integration of efforts with the EU partners help with the efficiency of the work and enriching the technical perspective with links to other disciplines and organizations. This is about connecting pieces that are otherwise in silos.

*The key issues for which stakeholders (especially outside of Europe) have given feedback to the project scope/direction (also during the middle of the project) was discussed.* The Panel members gave an example from PREDIS project, how stakeholders have been influencing the direction of the efforts in the project. Stakeholders raised the need for more research in many areas, including (i) the safety case regarding thermal treatment methodology and residual byproducts, (ii) the waste from SMRs is an emerging topic – the EURAD and PREDIS projects provide a foundation for IAEA to have dialogue with the SMR designers and producers, and (iii) Digitalization, AI and digital twins offer opportunities but involve risks and uncertainties, so further work is needed here.

3. *Another discussion topic was how do such projects address human capacity building, especially from the perspectives of continuity and the next generation experts.* The Panel members noted that the PREDIS project, for example, provides a group for research students to discuss issues, to have placements (mobility) at another partner institution, to participate in training, summer schools and conferences. This creates a community for young professionals to learn from each other and from more experienced colleagues. From project management perspective, these EC projects offer the opportunity for the next generation and young people to “shadow” the experienced ones. The next generations could also be coming from other industries, mid-career development in waste management is also recognized and supported. The Radioactive Waste management field is in high competition with other fields such as aerospace, SMRs, IT, etc. for STEM graduates. These collaborative projects such as PREDIS gives a fast-track and synergy in capacity building by the close collaboration between European partners, the IAEA and the USA partners.

4. *A comment was raised from the audience: a participant from Germany noted the good collaboration in the EURAD project and highlighted the importance of having such platform to find out what is already existing, to what is happening, since there are already many parallel things already happening.*

The Panel members emphasized the effects of bringing the project communities of practice together. It was noted that this is a continuous process: there will be large waves of retirements across the sector in the coming years, so there is a need to get the tacit knowledge shared; knowledge management is crucial for the workforce development.

5. *A question was raised from the audience: EURAD-1 covered fairly broad topics. In EURAD-2 do you have meetings, how do the Work Packages connect to each other?*

It was clarified that there are Work Package meetings, task meetings but the focus is on synergies between different Work Packages. Different Work Packages also have joint meetings to identify synergies. At a large annual event senior experts are following the work in the different areas. Once a year, for one week, 200+ people gather. Every WP has budget for travel to facilitate this. Otherwise, everything else is performed online, whilst accounting for working across different time zones.

6. *The last question from the audience was raised from a participant from a NPP in Bavaria in Germany, which is in decommissioning. A lot of knowledge on decommissioning is accumulated and lots of waste is produced daily. It was asked whether there are German industry partners in the projects.* The Panel members informed that BGJ is a main partner, and the projects have had German utilities. The Panel closed with a call for action to join the stakeholder groups of the existing two projects to get information what is going on, invitations for public events, surveys, feedback discussion groups; these will be the basis for the new discussion groups, which will be framed in autumn 2024. **Erika Holt** and **Christophe Bruggeman** can be contacted for further information.